

DETERMINANTS OF HIGH MATERNAL MORTALITY RATE IN INDONESIA

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Abstract

Background: Maternal Mortality Rate (MMR) reflects women's health status and the quality of a country's healthcare system. In Indonesia, the MMR in 2019 was 305 per 100,000 live births, indicating a significant health issue. The high MMR is caused by various complex and interrelated determinants, including medical complications, socio-economic conditions, healthcare access, cultural factors, and nutrition. **Objectives:** This study aims to identify and analyze the determinants contributing to the high MMR in Indonesia and provide evidence-based recommendations for effective policies and programs to reduce MMR. **Methods:** This literature review uses descriptive and thematic methods, analyzing 11 articles published between 2013 and 2024. Articles were selected based on their relevance and quality in discussing maternal mortality determinants. Data were collected and analyzed to identify key factors contributing to maternal mortality. **Results:** The study found that obstetric complications such as postpartum hemorrhage and pre-eclampsia/eclampsia are primary causes of maternal mortality. Non-communicable diseases such as heart disease and hypertension also play a significant role. Socio-economic factors, including maternal education and employment status, influence maternal mortality risk. Limited access to and poor quality of healthcare services in rural and remote areas exacerbate the situation. Cultural beliefs and stigma towards modern healthcare services, as well as traditional health practices, hinder timely medical care. Maternal nutritional status, including anemia and chronic energy deficiency, significantly contributes to maternal mortality. **Conclusions:** To reduce MMR, it is necessary to improve healthcare access and quality, provide continuous health education, enhance maternal nutritional status, strengthen health policies, and improve environmental conditions. Implementing comprehensive maternal health programs and collaboration among stakeholders is crucial to achieving the target of reducing maternal mortality in Indonesia.

Keywords: *Maternal Mortality Rate; Mortality Determinants; Indonesia; Health Policy; Healthcare Services*

BACKGROUND

Maternal Mortality Rate (MMR) is one of the key indicators reflecting the health status of women and the quality of the healthcare system in a country. MMR is defined as the number of female deaths caused by pregnancy and childbirth complications per 100,000 live births within a specific period. In Indonesia, MMR remains a significant health issue despite various efforts to reduce it. According to data from the Central Bureau of Statistics (BPS) and the Indonesian Ministry of Health, the MMR in Indonesia in 2019 was 305 per 100,000 live births (Kemenkes RI, 2019).

The high MMR in Indonesia is caused by various complex and interrelated determinants. These factors include medical, socio-economic, cultural, and healthcare access aspects. The main medical causes of maternal mortality in Indonesia include postpartum hemorrhage, pregnancy-induced hypertension, infections, and other childbirth complications. Additionally, socio-economic factors such as educational level, family income, and employment status also play important roles in determining the risk of maternal death. Women with low educational backgrounds and poor economic conditions tend to have limited access to quality healthcare services, including antenatal and safe childbirth services.

Access to healthcare services is also a significant determinant of the high MMR in Indonesia. Many women in remote and rural areas face difficulties in accessing adequate healthcare facilities. Long distances, inadequate transportation, and high costs often become the main barriers. Furthermore, cultural factors and social norms also influence the health behaviors of pregnant women. Some communities may have unsafe traditional practices or lack support for the use of modern healthcare services.

The Indonesian government has set a target to reduce MMR to 70 per 100,000 live births by 2030, in line with the Sustainable Development Goals (SDGs) (Kementerian PPN/Bappenas, 2023). Efforts to reduce MMR in Indonesia require a comprehensive and sustainable approach involving various sectors and stakeholders. Effective interventions should include improving access to and quality of healthcare services, empowering women through education and economic enhancement, and changing behaviors through health promotion and community education. This study aims to identify and analyze the determinant factors contributing to the high MMR in Indonesia, with the hope of providing evidence-based recommendations for more effective policies and programs to reduce MMR.

By understanding the factors contributing to the high MMR, it is expected that the most effective and efficient interventions can be identified to reduce maternal mortality in Indonesia. This study uses a systematic review approach to collect and analyze data from various existing studies, providing a comprehensive overview of the determinants of MMR in Indonesia..

METHODS

This study uses a descriptive-analytic design with a systematic review and meta-analysis approach. This approach was chosen to identify, assess, and interpret all research relevant to the determinants of maternal mortality (MMR) in Indonesia published in the last 10 years. Secondary data were collected from various scientific databases such as PubMed, Scopus, Google Scholar, and Garuda. Searches were conducted using keywords: "maternal mortality," "determinants," "factors," "Indonesia," "AKI," "Angka Kematian Ibu," as well as combinations like "maternal mortality AND determinants AND Indonesia."

The inclusion criteria for this study include studies published in the last 10 years (2013-2023), studies discussing the determinants of MMR in Indonesia, studies using quantitative, qualitative, or mixed methods, and articles available in full text and in English or Indonesian. Exclusion criteria include studies that discuss MMR globally without a specific focus on Indonesia, review articles that do not present empirical data, and publications not available in full text.

Searches were conducted in the mentioned databases using the specified keywords. The search results were filtered based on titles and abstracts to determine their relevance to the research topic. Articles meeting the inclusion criteria were downloaded and read in full. Researchers selected articles to ensure objectivity and reduce bias. From the selection process, the researchers finalized 11 articles to be discussed in this study.

Data were extracted from the selected articles using a prepared data extraction form. The information extracted included: article title, authors, year of publication, research methods, samples, main results, and conclusions. Data analysis included descriptive analysis and thematic analysis. In descriptive analysis, descriptive data from the selected studies, such as sample characteristics and research methods, were analyzed to provide an overview of the existing research. In thematic analysis, research findings were categorized based on emerging main themes, including medical factors, socio-economic factors, healthcare access, and cultural factors. Furthermore, findings from various studies were compared and synthesized to identify common patterns and trends.

Validity and reliability in this study were maintained to ensure the research results presented accurate data. Internal validity was maintained by using strict inclusion and exclusion criteria and a systematic article selection procedure. External validity was enhanced by including various studies from different regions in Indonesia. Reliability was maintained through the selection and data extraction processes conducted by researchers. Discussions and consensus were reached to address differences of opinion among researchers.

RESULTS AND DISCUSSION

1. Descriptive analysis

This study aims to identify and analyze the determinant factors contributing to the high Maternal Mortality Rate (MMR) in Indonesia through a literature review of various relevant articles. A total of 11 articles published between 2013 and 2024 were analyzed using descriptive and thematic methods. These articles were selected based on their relevance and quality in discussing the determinants of maternal mortality.

The descriptive analysis shows that most studies used observational research designs with various methods, such as case-control studies, cross-sectional, retrospective, and prospective studies. The sample sizes in these studies varied, ranging from small studies with 24 samples (Aeni, 2013) to large studies with over 5 million live births (Cameron et al., 2019). Data were collected through interviews, questionnaires, secondary data from medical records and death reports, as well as household surveys.

The sample characteristics analyzed in this study included mothers who died during pregnancy, childbirth, or the postpartum period, as well as controls that included mothers who gave birth without complications. The analyzed factors included obstetric complications such as postpartum hemorrhage and pre-eclampsia/eclampsia, non-communicable diseases such as heart disease and hypertension, and socio-economic status of the mothers, including education and employment.

The study also found that limited access and low quality of healthcare services in rural and remote areas are major barriers to reducing maternal mortality. Distance to healthcare facilities, the limited number and distribution of medical personnel, and high costs often

become the main obstacles in obtaining necessary care. Additionally, cultural beliefs and stigma towards modern healthcare services and traditional health practices also influence the behavior of seeking medical assistance and handling pregnancy complications.

Based on this analysis, it is concluded that to reduce MMR in Indonesia, it is necessary to improve access to and quality of healthcare services, provide continuous health education, improve maternal nutritional status, strengthen health policies, and enhance environmental conditions. Implementing comprehensive maternal health programs and fostering collaboration among stakeholders are crucial to achieving the target reduction in maternal mortality in Indonesia.

2. Thematic analysis

This study identifies several key themes contributing to the high Maternal Mortality Rate (MMR) in Indonesia through thematic analysis. The following are the results of the thematic analysis based on the themes identified from the 11 articles analyzed::

- a. **Medical Factors:** Obstetric and non-obstetric complications are the primary causes of maternal mortality. Obstetric complications such as postpartum hemorrhage, pre-eclampsia/eclampsia, prolonged labor, and infections are significant causes of maternal death in Indonesia (Mariati et al., 2011; Syairaji et al., 2024). Postpartum hemorrhage and pre-eclampsia/eclampsia often cause sudden death if not treated promptly and adequately. Additionally, non-obstetric complications such as heart disease, other non-communicable diseases, and non-pregnancy-related infections like COVID-19 also significantly contribute to maternal mortality (Syairaji et al., 2024). Heart disease and infections like COVID-19 add to the health burden of already vulnerable pregnant women.
- b. **Socio-Economic Factors:** Maternal education and employment status significantly influence maternal mortality risk. Mothers with a middle school education experience higher maternal mortality compared to those with higher education levels (Rochmatin, 2018). Lower education results in a lack of knowledge about pregnancy health and access to quality healthcare services. The majority of maternal deaths occur among housewives (Rochmatin, 2018). Maternal employment also affects mortality risk, with housewives being more vulnerable due to limited access to information and healthcare services (Respati et al., 2019).
- c. **Healthcare Access:** Limited access and low quality of healthcare services in rural and remote areas are critical factors in maternal mortality. Distance to healthcare facilities and delays in medical treatment often become major obstacles in obtaining necessary care (Cameron et al., 2019; Respati et al., 2019). These delays can occur due to inadequate transportation and high costs. The quality of healthcare services, including the availability of medical personnel and adequate healthcare facilities, significantly influences maternal mortality rates (Syairaji et al., 2024). The shortage of medical personnel and inadequate facilities reduce the ability to effectively manage pregnancy complications.
- d. **Cultural Factors:** Traditional health practices and cultural beliefs also affect the behavior of seeking medical assistance and managing pregnancy complications. Traditional health practices and cultural beliefs can hinder timely and effective medical care (Natasha & Niara, 2022). Some communities may trust traditional methods that are not always safe or effective in handling pregnancy complications. Additionally, beliefs and stigma against using modern healthcare services also become barriers to obtaining the necessary care (Ibrahim & Ridwan, 2022). This stigma often causes pregnant women to be reluctant to seek medical help until their condition becomes critical.

3. Comparison of Findings from Various Studies

The analyzed studies cover various locations in Indonesia with different research periods but show several consistent findings.

- a. **Medical Factors:** Nearly all studies indicate that obstetric complications such as postpartum hemorrhage and pre-eclampsia/eclampsia are the primary causes of maternal death. For example, Mariati et al. (2011) found that postpartum hemorrhage is the leading cause of maternal death in West Sumatra, while Syairaji et al. (2024) noted a significant decrease in deaths from hemorrhage and sepsis but an increase in deaths from hypertensive disorders and non-obstetric complications. Natasha and Niara (2022) also identified anemia and pregnancy complications as important factors affecting maternal mortality.
- b. **Socio-Economic Factors:** The educational status and employment of mothers play important roles in maternal mortality risk. Rochmatin (2018) reported that mothers with middle school education and those working as housewives are more vulnerable to death. Additionally, Respati et al. (2019) showed that maternal employment also affects the risk of death, with working mothers having a higher risk.
- c. **Healthcare Access:** Access to healthcare facilities and the quality of healthcare services significantly influence maternal mortality rates. Cameron et al. (2019) highlighted that limited access to healthcare services, including the number of doctors and distance to hospitals, significantly contributes to maternal deaths. The study also found that areas with limited access to healthcare facilities have higher MMR. This was also confirmed by Syairaji et al. (2024), who showed that regions with limited access and inadequate healthcare facilities experience higher maternal mortality rates.
- d. **Cultural Factors:** Traditional health practices and cultural beliefs also affect the behavior of seeking medical assistance and managing pregnancy complications. Natasha and Niara (2022) showed that beliefs and stigma against modern healthcare services can be barriers to obtaining timely care. Ibrahim and Ridwan (2022) added that traditional beliefs and practices often hinder mothers from seeking medical help quickly and appropriately.

4. Identification of Patterns and Trends

From the descriptive and thematic analysis, several common patterns and trends can be identified:

- a. **Changes in Causes of Maternal Death:** Studies show a shift in the causes of maternal death from obstetric complications such as hemorrhage and sepsis to hypertensive disorders and non-communicable diseases. This indicates an increasing prevalence of non-communicable diseases affecting pregnant women's health in Indonesia.
- b. **Disparities in Healthcare Access and Quality:** Disparities in access and quality of healthcare between urban and rural areas significantly impact maternal mortality rates. Regions with limited access to healthcare facilities, such as Sulawesi and Eastern Indonesia, have much higher MMR compared to regions like Java-Bali, which have better healthcare facilities.
- c. **Influence of Socio-Economic and Cultural Factors:** Maternal education and employment status, as well as cultural beliefs and stigma towards modern healthcare services, significantly influence maternal mortality risk. Education and increased awareness about the importance of timely and quality medical care are key to reducing maternal mortality.
- d. **Importance of Health Policies and Programs:** The importance of health policies and programs supporting equitable and quality access to healthcare is evident. The implementation of Maternal Death Surveillance and Response (MDSR) and other policies supporting improved access and quality of healthcare services are necessary to reduce maternal mortality in Indonesia.

5. Synthesis and New Findings

In addition to the factors identified from common patterns and trends, the 11 articles revealed several determinant factors contributing to the high maternal mortality rate in Indonesia. These factors include:

a. Infrastructure Factors

Health infrastructure includes physical facilities and health services available to pregnant women. Several studies show that regions with inadequate health infrastructure have higher maternal mortality rates. Difficult access to healthcare facilities, especially in remote and rural areas, is a major barrier to obtaining necessary care (Cameron et al., 2019; Respati et al., 2019). This includes distance to hospitals, the number and distribution of healthcare facilities, and the availability of transportation for pregnant women.

b. Policy and Healthcare System Factors

Government policies and healthcare systems play a vital role in reducing maternal mortality. Implementing programs such as Maternal Death Surveillance and Response (MDSR) and other maternal health programs can improve the quality and access to healthcare (Syairaji et al., 2024). Policies supporting an increased number of healthcare workers and equitable distribution across regions are also crucial. Routine evaluation and monitoring of health programs help ensure their effectiveness and alignment with community needs (Natasha & Niara, 2022).

c. Educational and Knowledge Factors

Maternal education and knowledge about reproductive health are crucial factors influencing maternal mortality. Mothers with higher education levels tend to have better knowledge about pregnancy care and are more proactive in seeking healthcare services (Rochmatin, 2018). Continuous health education about the importance of antenatal check-ups and recognizing pregnancy complications can help reduce maternal mortality risk (Natasha & Niara, 2022).

d. Nutritional and Health Status Factors

Maternal nutritional status before and during pregnancy significantly affects the health of the mother and baby. Anemia and chronic energy deficiency are common problems found in several studies and significantly contribute to maternal mortality (Aeni, 2013; Natasha & Niara, 2022). The general health status of the mother, including a history of disease and chronic health conditions, is also an important risk factor (Syairaji et al., 2024).

e. Environmental Factors

The physical and social environment where the mother lives can affect the risk of maternal death. Poor environmental conditions, such as inadequate sanitation, limited clean water, and pollution, can increase the risk of infection and complications during pregnancy (Ibrahim & Ridwan, 2022). Additionally, a supportive social environment, including support from family and the community, is crucial to ensure pregnant women receive the necessary care promptly.

This study did not involve direct human participants, so ethical approval was not required. However, research ethics were maintained by correctly citing all data sources and respecting the original authors' copyrights. Limitations of this study include the constraints of secondary data in accessing some full-text articles and potential incomplete or inconsistent data. There may also be publication bias, where studies with significant results are more likely to be published than those with non-significant results.

CONCLUSION

The analysis of 11 articles shows that obstetric complications such as postpartum hemorrhage and pre-eclampsia/eclampsia, as well as non-communicable diseases like heart disease and hypertension, are the primary causes of maternal death in Indonesia. Mothers with middle school education and those working as housewives are more vulnerable to maternal death due to limited health knowledge and inadequate access to healthcare. Limited access and low quality of healthcare services in rural and remote areas are also major challenges. Trust in traditional health practices and stigma against modern healthcare services hinder timely medical care.

Government policies and health programs like Maternal Death Surveillance and Response (MDSR) are crucial for improving the quality of maternal healthcare services. Continuous health education and increasing mothers' knowledge about pregnancy care and complications are essential. Maternal nutritional status, such as anemia and chronic energy deficiency, also needs improvement through supplementation and nutritious food intake. Poor environmental conditions increase the risk of infection and pregnancy complications, making sanitation improvements and clean water provision very important.

To reduce maternal mortality rates, it is necessary to improve access to and quality of healthcare services, expand education and nutrition programs, and strengthen policies and support for a healthy environment. Implementing comprehensive maternal health programs and fostering collaboration among stakeholders is crucial.

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