

A Literature Review of Maternal Mortality in the Countryside. What are the Policies and Prevention?

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Abstract

Maternal mortality in rural areas is still high and is a health problem that is a priority for intervention and policy. Various studies have been conducted to create a prevention model and various policies implemented in several countries have been carried out to deal with maternal mortality in rural areas. This study aims to determine the policies and models or concepts of preventing maternal mortality in rural areas. This study is a literature review using the Scopus database. The strategy in finding articles uses PICOS (Population, Intervention, Comparison, Outcome and Study design). 6 articles that fit the criteria and are relevant to the research objectives. Policy and prevention of maternal mortality in rural areas: (1) Fulfillment of health workers, (2) Fulfillment of health facilities, (3) Maternity waiting homes, (4) Community-based continuous training programmes, (5) HEP (Health Extension Program) and HDA (Health Development Army) policies, (6) Health Insurance. The findings of this study indicate that some of the policies and prevention models implemented were successful in reducing maternal mortality in rural areas, so policies and models for preventing maternal mortality can be applied in rural areas.

Keywords: Policy, Prevention, Maternal Mortality, Rural.

INTRODUCTION

Maternal mortality rates globally are very high and about 830 women die from pregnancy or childbirth complications worldwide every day. In 2000 WHO, UNICEF and UNFPA estimated the maternal mortality rate to reach 400 per 100,000 live births. This means that every minute, one woman in the world, dies. As many as 99% of the average maternal mortality occurs in developing countries (*Maternal Mortality*, n.d.; Respati et al., 2019). In 2-17 years, 94% of maternal deaths occurred in countries with low and lower middle incomes (Oruh, 2021)

The global target by 2030 is that all countries must reduce the maternal mortality ratio, the maternal mortality rate decreases to 70 per 100,000 live births and geographical constraints are one of the causes of difficulties for people to access health facilities, especially those in remote areas. This is in line with research conducted in Pakistan's Chitral region, where maternal mortality rates are particularly high (Andini & Aan Julia, 2022) due to women's inability to access skilled care due to the high costs associated with travel and use of such services (Tunçalp et al., 2014).

To effectively overcome this problem, it is necessary to prevent maternal death early. Some of the factors that affect maternal health include social, economic, political, environmental and cultural health determinants (Tabazzum firos et al., 2016). Apart from

these causes, difficult access to health services is also one of the causes of maternal death. . The pattern of seeking health help from the community, the importance of supporting infrastructure to get health services for people in remote areas such as transportation, electricity networks, clean water and sanitation has a very big role (Diajeng Sri Andriani Permatasari & lutfan lazuardi, 2019; Heru Santoso Wahito Nugroho et al., 2019).

In the countryside, emergency transportation is often unavailable and private transportation is unreliable(D'Ambruoso, 2012). In addition, an important influence on maternal health is that it includes political, economic, social, cultural and environmental dimensions (Tabazzum firos et al., 2016).

Prevention of maternal mortality can be done through strategies to empower communities to actively participate in the process of identifying and analyzing their own health problems, this statement is also in line with the WHO statement that maternal mortality can be prevented with a human rights approach to maternal and newborn health, which includes women, girls, families and communities by enabling participation and thus influencing how the system health work . so as to reduce maternal mortality rate, it needs the cooperation of many parties (Prasetyo et al., 2018; Tabazzum firos et al., 2016; WHO, 2015)

Health problems are closely related to the ability of the community to access or reach health care facilities (Diajeng Sri Andriani Permatasari & Lutfan Lazuardi, 2019). A similar view is according to the results of the research of Respati et al, 2019 that the indirect causative factors that cause maternal death include transportation factors, family social and economic status, education, and culture, delays in obtaining childbirth assistance or difficulty in reaching service facilities due to transportation and remote residences. (Respati et al., 2019)

The importance of engaging communities at all levels to design targeted and contextualized solutions. Multisectoral collaboration is needed to effectively address and promote maternal health so as to reduce maternal mortality rates (Tabazzum firos et al., 2016).

Because maternal mortality rates are still high in rural areas and many studies provide some prevention for maternal mortality, this literature review aims to provide an overview of prevention with various interventions to prevent maternal mortality in rural areas. Furthermore, it is hoped that it can answer questions related to policies in several rural areas, strategies and factors that affect maternal mortality. The review can also inform health policy actors and practitioners to address maternal mortality in rural areas. This review of the literature is guided by the following question: What are the prevention and policies that can be done to address maternal mortality in rural areas. The purpose of this literature review is to identify prevention and policies implemented to address maternal mortality in rural areas

RESEARCH METHODS

Article search was conducted on May 12, 2024 on the pubmed database Search is not limited by publication date. Article search through strategy using PICOS Tools (population, intervention, comparison, outcome and study design). Keywords included in the Scopus database "maternal OR mother AND prevention OR policy AND death AND rural"

Table 1. Data selection: Inclusion and exclusion criteria

PICOS	Inclusion criteria	Exclusion criteria
Strategy		
Population	Pregnant women, mothers who have undergone childbirth (42 days after childbirth) in rural areas	<ul style="list-style-type: none"> • Not pregnant women, • Mothers who do not have childbirth • Mothers who have been in labor for more than 42 days • Pregnant women who do not live in rural areas
Intervention	<ul style="list-style-type: none"> • There were no specific interventions. • Eligible studies were preventive and policy interventions for maternal mortality or mothers who had given birth 42 days after termination of pregnancy in rural areas 	Prevention in pregnant women who do not live in rural areas
Comparison	There were no comparison groups for this study.	There is no comparison.
Outcome	<ul style="list-style-type: none"> ▪ Cases of female deaths in rural areas caused by their pregnancy or management, but not due to other causes ▪ Cases of maternal deaths in rural areas after preventive measures and policies 	<ul style="list-style-type: none"> ▪ Cases of female deaths that are not caused by pregnancy or its management, such as traffic accidents, falls, natural disaster factors and others.
Study design	<ul style="list-style-type: none"> ▪ Published the last 10 years between 2014-2024 ▪ Publication to the final publication stage ▪ English ▪ Source type : journal ▪ Document Type : Article ▪ Accessible 	<ul style="list-style-type: none"> ▪ Published over the last 10 years ▪ Article is still in process/ has not been published ▪ Published in a language other than English ▪ Source Type : Conference proceedings, Book, Book series, Trade journal ▪ Document type in the form of Policy brief, Reviews Conference paper, Letter, Book chapter, Note,

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- Editorial
 - Erratum, United States
 - Conference review,
 - Book,
 - Short survey,
 - Data paper,
 - Retracted,
 - Undefined
 - Inaccessible
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Table 1 shows the use of the PICOS strategy in setting inclusion and exclusion criteria. Population or Problem is a problem or goal in research. In this literature review, the population or group/target that wants to be researched is mothers in rural areas. The mother in question is a pregnant woman or a mother who has given birth or 42 days after giving birth in the countryside. Intervention is a program, concept, prevention model and policy that is applied to reduce maternal mortality in rural areas. Comparison is a comparator. In this literature review, no comparators were determined. The outcome is a case of maternal death or maternal death in rural areas and the last is a study design.

Data screening and selection

Articles taken from searches in the Scopus database are selected by setting inclusion and exclusion criteria. The first screening is the year of the article, then continued with the publication stage, then continued with the language, then filtered by source type, continued with Document type filtering, then continued with open access filtering and finally relevant articles. At this stage, a reference list of full-text articles that meet the review criteria is checked to identify and include more relevant articles that may have been missed by the database (e.g., not indexed). The article selection process is according to the inclusion and exclusion criteria with the help of PRISMA flowchart tools.

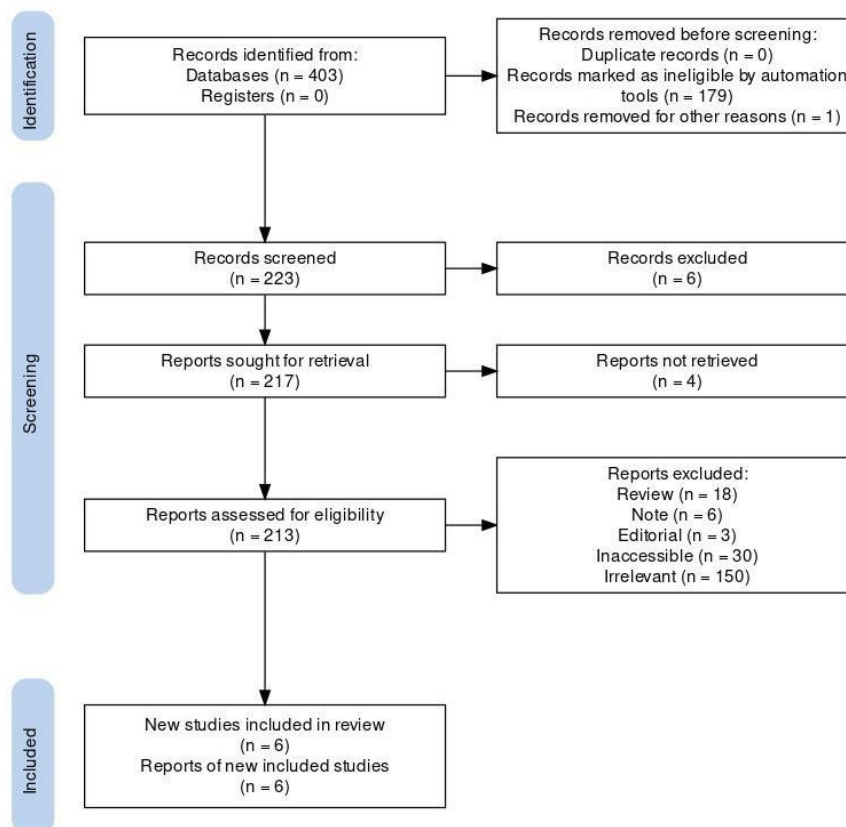


Figure 1. PRISMA Flow Diagram

Based on figure 1, it can be seen that the articles obtained in the Scopus database by entering keywords totaling 403. Then 179 articles published between 2014 and May 2024 were selected. Furthermore, the selection of articles that have been published is carried out, excluding articles that are still in process. There is 1 article that is still in the process of publication. Then continued with the selection of articles based on the language used in the article, English articles were selected, 217 articles were obtained in English. After the selection of articles based on language, the selection was continued based on the source of the article, articles published in the journal were selected, articles that did not match the source were published in a total of 4 articles, 3 came from books, 1 came from Conference proceedings. The results of the articles selected based on published sources were 213. Then the selection of articles based on document type, articles that do not meet the criteria according to the criteria are 27 consisting of 18 articles of the type of literature review document, 6 in the form of reports, 3 editorial. Furthermore, articles were selected based on readable articles/open access, 30 articles were obtained that were incomplete and could not be accessed. The final selection is based on the relevance of the research objectives to be discussed. 6 articles were found that were relevant to the research objectives and will be reviewed.

Quality assessment

In this study, quality assessment was carried out. According to Salleh, 2011, Quality assessment to estimate the credibility and validity of research. A tool as a 'structured instrument of any kind that aims to help users assess quality (Sanderson et al., 2007; Wahyudiana & Andayani, 2020).

Table 2. Study Quality Checklist

It	Items	Answer
1	What the article refereed?	Yes/No/Partially
2	Were the aim(s) of the study clearly stated?	Yes/No/Partially
3	Were the study participants or observational units adequately described? For example, students' programming experience, year of study etc	Yes/No/Partially
4	Were the data collections carried out very well? For example, discussion of procedures used for collection, and how the study setting may have influenced the data collected?	Yes/No/Partially
5	Were potential confounders adequately controlled for in the analysis?	Yes/No/Partially
6	Were the approach to and formulation of the analysis well conveyed? For example, description of the form of the original data, rationale for choice of method/tool/package?	Yes/No/Partially
7	Were the findings credible? For example, the study was methodologically explained so that we can trust the findings; findings/conclusions are resonant with other knowledge and experience?	Yes/No/Partially

Data Extraction and Synthesis

This review literature is carried out to search for information that is in accordance with the research objectives or research questions. An extraction and synthesis process is needed in the article, an article that discusses prevention models/concepts/methods and policies related to the death of pregnant women in rural areas is chosen.

RESULTS AND DISCUSSION

Table 3. List of selected articles

Author	Heading	Year	Country	Results
Uneke C.J.; Sombie I.; Chukwu H.C.; Johnson E.	Developing equity-focused interventions for maternal and child health in nigeria: An evidence synthesis for policy, based on equitable impact sensitive tool (EQUIST)(Uneke et al., 2019)	2019	Nigeria	Family health care, budget allocation in the health sector, Placement of skilled professionals, cooperation with the private sector, health insurance.
Conlon C.M.; Serbanescu F.; Marum L.; Healey J.; LaBrecque J.; Hobson R.; Levitt M.; Kekitiinwa A.; Picho B.; Soud F.;	Saving Mothers, Giving Life: It Takes a System to Save a Mother(Conlon et al., 2019)	2019	Uganda Zambia	Saving Mothers, Giving Life (SMGL): interventions in the form of fulfilling health human resources, fulfilling health facilities, increasing the

Spigel L.; Steffen M.; Velasco J.; Cohen R.; Weiss W.				salaries of health workers in rural areas
Buser J.M.; Munro-Kramer, M.L.; Carney M.; Kofa A.; Cole G.G.; Lori J.R.	Maternity waiting homes as a cost-effective intervention in rural Liberia(Buser et al., 2019)	2019	Liberia	Maternity waiting homes
Moshi F.V.; Kibusi S.M.; Fabian F.	The effectiveness of community-based continuous training on promoting positive behaviors towards birth preparedness, male involvement, and maternal services utilization among expecting couples in rukwa, Tanzania: A theory of planned behavior quasi-experimental study (Moshi et al., 2018)	2018	Tanzania	Community Based Continuous Training: an intervention in the form of increasing knowledge and training for mothers and husbands
Yang L.; Wang H.	Primary health care among rural pregnant women in China: achievements and challenges in maternal mortality ratio(Yang & Wang, 2019)	2019	China	Fulfilling the basic health of pregnant women through interventions to increase the number of health workers in rural areas, increase the accessibility of health services for rural pregnant women at home, standardize and regulate the implementation of cesarean sections, as well as provide health service standards and reduce risks in pregnancy
Matthias Rieger , Natascha Wagner , Anagaw Mebratie , Getnet Alemu , Arjun Bedi	The impact of the Ethiopian health extension program and health development army on maternal mortality: A synthetic control approach(Rieger et al., 2019)	2019	Ethiopia	Health Extension Program (HEP) Health Development Army (HDA)

Based on table 3, it is known that the number of articles that meet the inclusion criteria is 6 articles. 5 articles published in 2019 and 1 article published in 2018. Countries that implement policies to prevent maternal mortality in rural areas based on the article obtained are Nigeria, Uganda, Zambia, Liberia, China, Tanzania and Ethiopia

Discussion

Fulfillment of Human Resources (HR) and increasing incentives for Human Resources (HR) in Rural Health Facilities

UNICEF designed the EQUitable Impact Sensitive Tool (EQUIST) to enable the global health community to address the issue of equity in maternal, newborn and child health (Uneke et al., 2018). The number of Human Resources (HR) in health facilities is insufficient in rural Nigeria. The existence of these problems by using the EQUitable Impact Sensitive Tool (EQUIST) to reduce maternal mortality rates, the need for policies to fulfill Health Human Resources (HR), the need for skilled professionals in childbirth, emergency obstetrics in rural Nigeria (Uneke et al., 2019)

The countries of Zambia and Uganda have also implemented policies to increase the number of health workers placed in health facilities in rural areas to reduce maternal mortality rates. The number of health workers in villages in Uganda and the Safe Motherhood Action Group (SMAG) in Zambia, set up by the Government, is insufficient. Healthcare facilities are short of 24-hour staff consisting of training midwives, anesthesiologists, and surgeons. Through the intervention of the SMGL (Saving Mothers, Giving Life) program, the distribution of health workers was carried out in several rural areas that were used as pilots. In addition, there is an increase in salaries for health workers who are stationed in rural areas. Doctors receive a salary increase to work in Puskesmas IV in rural areas rather than in hospitals, an incentive that was later adopted nationwide by the Ministry of Health. The maternal health outcomes achieved after 5 years of implementation in the pilot villages were considerable: There was a 44% reduction in maternal mortality in villages in Uganda, as well as a 38% reduction in maternal mortality in health facilities and a 41% reduction in maternal mortality in all villages in Zambia. The shortage of medical personnel also occurs in rural and remote areas of China. The policy implemented to reduce maternal mortality in rural areas is to strengthen primary health services in rural areas, one of which is through the placement of skilled health workers to reduce the risk of pregnancy in several remote areas in China (Conlon et al., 2019; Schiff et al., 2017).

Several factors greatly influence pregnant women to take advantage of health services in rural areas, one of which is the lack of health human resources so that many maternity service centers in rural areas are forced to close (Damayanti et al., 2023)

Skilled health workers are fundamental to be handled in rural areas. With the placement of health workers in accordance with the number of ratios and competencies needed, it can improve the degree of public health and provide treatment to pregnant women.

Fulfillment of Health Facilities in Rural Areas

In order to reduce the maternal mortality rate in Nigeria, it is necessary to fulfill adequate health facilities in rural areas. Based on the EQUIST analysis, it was obtained that the government could not meet all health-related needs optimally, so the private sector was needed to be involved in the mechanism of providing facilities and so on (Uneke et

al., 2019). In addition, Zambia and Uganda also carry out the same policy in terms of fulfilling and improving health facilities to reduce the number of maternal deaths in rural areas. Maternity rooms in many hospitals and health centers are damaged and overcrowded, as well as a shortage of air, electricity, and functioning toilets. Equipment is missing, non-functional, or insufficient for patients, so maternity wards and operating rooms are being renovated to increase the capacity of the facility. In addition, to overcome low antenatal visits and realize timely access to health facilities, interventions are carried out to facilitate access for mothers to health facilities in the form of subsidies for motorcycle transportation vouchers and special protocols for the transportation of pregnant women (Conlon et al., 2019)

Many women still lack access to quality health care, hindering their ability to achieve the best level of health. Pregnant women in the archipelago tend to be unable to access health services due to transportation cost barriers (Suparmi et al., 2019).

Many pregnant women who live in rural areas or far from urban centers, do not take advantage of health service facilities, so it is necessary to improve and fulfill health facilities in rural areas for pregnant women so that mothers are not late in getting treatment such as childbirth.

Maternity waiting homes

Health facilities in the form of maternity waiting houses are also important in preventing maternal deaths in rural areas. A maternity shelter is a place to live close to health facilities where women live waiting for childbirth and postpartum. The maternity home service is used by women to settle down during the last weeks of their pregnancy and is available free of charge to all pregnant women, and access does not depend on referrals or distances between a woman's home and a rural primary health clinic. Each maternity shelter has a minimum of eight beds equipped with mosquito nets, outdoor toilet facilities, and an outdoor kitchen equipped with cooking utensils. The use of maternity shelter facilities is reported monthly. The total number of women's lives saved through maternity home intervention for 3 years is 10. The difference in maternal mortality rates without maternity waiting houses is 17 maternal deaths while with maternity waiting house facilities, 7 maternal deaths. The benefits of maternity waiting houses are that they can reduce the incidence of perinatal mortality and complications, reduce the incidence of maternal complications and mortality, and have good access to health services (Buser et al., 2019; Gurara et al., 2022).

The results of the maternity waiting house intervention can save the mother's life so that it can be applied in rural areas in reducing the risk of maternal death.

Community-based continuous training/CBCT

This community-based continuous training (CBCT) program is carried out in rural Tanzania to prevent maternal deaths in rural areas. The provision of counseling and training to women is designed to raise awareness of safe maternal and newborn health. Counseling and training were given to mothers and husbands from each village group who were the research samples. This community-based continuous training program aims to improve maternity readiness, male involvement, and the use of maternal services among pregnant couples. The program includes discussions on behavioral beliefs, normative beliefs, and behavioral control beliefs that hinder childbirth readiness in health facilities, male involvement, and the use of maternal services. In addition, the program also provides

knowledge about birth readiness (antenatal services, danger signs, and preparation for childbirth in health facilities), labor signs, and newborn care. The training program provided includes readiness to give birth before 24 weeks of pregnancy and signs of labor as well as newborn care. The counseling provided discussed family planning; Nutrients; preparation for pregnancy and childbirth; and danger signs during pregnancy, childbirth and postpartum. The results of the intervention of community-based continuous training programs involving mothers and husbands can reduce three delays, namely delays in decision-making to seek health services, delays in reaching health facilities, and delays in getting the right services when reaching health facilities and increasing antenatal visits. (Moshi et al., 2018)

CBCT intervention programs in encouraging positive behavior in childbirth readiness and readiness to face complications. CBCT intervention programs can encourage pregnant women to complete antenatal visits and prepare for labor well so that they have twice as good pregnancy outcomes as mothers who do not have antenatal visits (Swain et al., 2019). In the Mertisa and Irma study, 2022, it was found that husband support was related to the accuracy of Antenatal Care visits for pregnant women. Husbands greatly influence ANC visits, the better the husband's support given, the lower the level of inaccuracy of ANC visits. Therefore, health workers should provide education to mothers and husbands about the importance of support during pregnancy (Mertisa Dwi Klevina & Irma Mathar, 2022).

Community-based continuous training programs through increasing maternal knowledge about labor danger signs and delivery times and husband involvement can help in decision-making so that it is not too late to reach health facilities in rural areas. Punctuality of arrival at health facilities can reduce the risk of maternal death.

HEP (Health Extension Program) and HDA (Health Development Army) Program Policies

The maternal mortality rate in Ethiopia decreased from 728 to 357 between 2003 and 2016, a 46% decline due to combined interventions from HEP and HDA. The HEP (Health Extension Program) program is one of the most innovative community-based health programs in Ethiopia. This is based on the assumption that access to and quality of basic health services in rural communities can be improved through the transfer of health knowledge and skills to households. The Health Development Army (HDA) is a women-centered community movement inspired by military structure and discipline. The particular goal is to improve maternal health outcomes (Rieger et al., 2019).

HEP and HDA interventions may improve antenatal visits. increasing the use of maternal health services so that it can be a solution in reducing maternal mortality rates.

Health Insurance

The health insurance scheme is one of the intervention packages that has a very high potential in improving public health such as reducing maternal mortality. (Uneke et al., 2019)

Health insurance ownership is significantly related to increased chances of childbirth in hospitals, mothers who have health insurance and have higher economic status have a greater opportunity to take advantage of maternal health services (Suparmi et al., 2019).

Health insurance is very beneficial to people who have a low economic level, who cannot afford to pay for treatment if they are treated in a health facility. With the existence

of a health insurance scheme for the community and specifically for pregnant women, it can have an impact on the desire of pregnant women to use health facilities as a place to improve their health, get treatment and childbirth.

CONCLUSION

The high maternal mortality rate in rural areas is an important thing for the state to pay attention to. Nigeria, Zambia, Uganda, Liberia, China, Tanzania and Ethiopia have implemented prevention policies and concepts that are able to reduce maternal mortality rates in rural areas. The policies and prevention models or concepts implemented are the fulfillment of health human resources and health facilities in rural areas, maternity waiting houses, community-based continuous training programs, and health insurance schemes.

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