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Maternal Health Interventions in Rural, Resource-Limited Countries

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Maternal Health Interventions
in Rural, Resource-Limited Countries

By

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Introduction:

Pregnant women are continuing to die at unacceptable rates around the globe. According to the World Health Organization, complications during pregnancy and childbirth are the leading cause of death and disability among reproductive age women in developing countries.¹ Maternal mortality is often a reflection of a combination of causes: medical conditions while giving birth (ie. hemorrhage, eclampsia, and sepsis); other pre-existing medical conditions (ie. malaria, diabetes, HIV/AIDS); and socio-economic factors (ie. access to contraception, religious beliefs, and political agendas) that when combined, largely compromise health care, most often in the poor, rural and marginalized communities.² Nearly all maternal deaths (99%) occur in resource-limited countries due to factors that could largely be prevented, highlighting many stark inequalities.³ Women in low-income communities and rural areas are disproportionately affected. In 2015, mothers giving birth in a low-income country were nearly 20 times more likely to die of maternal complications than mothers in a high-income country.³

These numbers shed light on an important topic that has not gone entirely unnoticed. In 2000, members of all 191 United Nations member states met to devise a list of eight goals that were deemed the most urgent and important issues to address by 2015, calling them the Millennium Development Goals.⁴ Banding together, these countries came up with unified targets to meet in order to improve the health of the world overall. Included in these goals, was improving maternal mortality. The target was to accelerate the decline of the global maternal mortality ratio to less than 70/100,000 births (decrease the current ratio by 75%), with no country having a maternal mortality ratio of more than twice the global average.³ Efforts were made at local, national, and international levels across the world to work towards this lofty goal. The maternal mortality ratio encompasses the risk associated with each pregnancy, due to a maternal death. The World Health Organization defines a maternal death as “the death of a woman while

pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes”.¹

The United Nations met once again in 2015 to evaluate the progress made by the Millennium Development Goals and develop another set of the most pressing world goals to achieve by the year 2030, called the Sustainable Development Goals. While maternal mortality rates decreased by nearly 50% in many resource-limited countries, the average global maternal mortality rate still remained at 216/100,000 in the year 2015. Studies evaluating this global maternal mortality rate found a disproportionate number of these deaths were continuing to occur in resource-limited countries, but in particular rural areas.⁵ Due to these still unacceptable numbers, the same maternal mortality goal (maternal mortality ratio to less than 70/100,000 births, with no country having a maternal mortality ratio of more than twice the global average) was brought forth into the new 2030 goals. This is all in hope to continue to drive maternal health research and decrease the number of maternal deaths, particularly through targeting interventions aimed at rural areas of resource-limited countries.⁵ Identifying this need has greatly shifted research in maternal health since being identified in 2015, as rural areas have unique barriers to overcome in order for interventions to be successful. In particular, many developing countries struggle to secure funding to adequately measure maternal deaths in order to allocate funding for much needed interventions. Due to this limitation, research in the development of these interventions are quite sparse, with no best practice identified.

This review will attempt to answer the question of what interventions, or interventional components, are effective in decreasing maternal mortality rates and overcoming barriers of rural, resource-limited countries? To help identify these barriers and interventions, relevant

literature and interviews conducted in the country of Costa Rica will be utilized. These findings will then inform suggestions for areas of improvement in curbing the maternal mortality ratio for generations to come.

Background:

Why are women dying?

Obstetric complications are a leading cause of death among women of reproductive age.¹⁰ For every woman dying due to maternal complications, approximately twenty more suffer injuries, infection, or disabilities related to pregnancy or childbirth.¹⁰ However, most maternal morbidities and deaths are preventable, as ways to manage or prevent these complications are well known. In developing countries, the most common causes of direct maternal death are hemorrhage, sepsis, pregnancy-induced hypertension and complications of unsafe abortion.⁶ The solutions that women would need are access to antenatal care during pregnancy, skilled care during childbirth, and care in the post-partum period after giving birth.³ However, if solving the majority of maternal deaths is this straight forward, why are these women continuing to die?

Why aren't women receiving the care they need?

These women are dying for multiple reasons. Most maternal deaths can be avoided if three delays were minimized- delay in deciding to seek professional care, delay in reaching a health facility, and delay in receiving treatment after reaching the health facility.⁷ These delays tie into multiple other reasons that may prevent pregnant mothers from receiving or seeking care- inadequate services (due to poverty, distance, lack of skilled birth professionals), cultural practices, and difficulties measuring mortality to implement proper interventions.⁴ However, before interventions to improve maternal mortality can be improved, barriers that are currently in place for these women must be further analyzed.

Inadequate care-

First, poor women in rural areas are the least likely to receive adequate health care. Sub-Saharan Africa and Southern Asia accounted for 86% of maternal deaths globally in 2013.⁴ Of these deaths, hemorrhage was the greatest contributor, accounting for more than 27% of maternal deaths in these regions.⁴ Delay in reaching a health facility due to long distances and poor availability of transportation have both been recognized as significant risk factors in outcome of a hemorrhage situation.⁸

During a pregnancy, the World Health Organization recommends at least four antenatal care visits to help ensure the health of the mother and unborn child.³ In addition to a health check, women often receive additional nutritional advice, warning signs that may indicate problems with the pregnancy, and also support in planning for a safe delivery. This is vital information that can alter the course of a pregnancy. In 2015, only 40% of pregnant women in low-income countries had the minimum recommended number of antenatal care visits.³ Many of these regions have low numbers of skilled health workers to attend the birth, leaving millions of births unattended by those with the knowledge to potentially save their life and/or the life of their unborn child.³

According to the Millennium Development Goals Report of 2015, a key strategy for reducing maternal morbidity and mortality is through making sure every birth occurs with the assistance of a skilled health professional, such as a nurse, doctor or midwife. However, despite the progress being made in the last quarter of a century, one in four babies and their mothers are still without access to this crucial medical care during childbirth.⁴

According to the same report, access to maternal and reproductive health services have stark inequalities between urban and rural areas of developing countries with a staggering 31 percentage-point gap.⁴ A prime example of this was displayed in an interview with Dr. Jose

Alejandro Madrigal Lobo of the Costa Rican Doctors Association on July 1st, about the Costa Rican public healthcare system. The way the healthcare system is set up, there are three levels of care: primary (clinics called Ebais), secondary (bigger clinics or more rudimentary hospitals) and tertiary (the most advanced care hospitals). While the healthcare system has progressed to become on par with that of the United States, there are still some vital challenges it faces, one of them being healthcare coverage. Ebais are the first line of care that citizens seek. Once seen here, they can get referrals as needed. Unfortunately, the healthcare sector is underfunded leaving the country at least 30 Ebais short of efficiently covering the entire country, according to Dr. Lobo. These 30 Ebais are lacking in the most rural of areas, causing these inhabitants to travel hours to reach any sort of healthcare for their needs, leaving them vastly underserved. Traveling to these Ebais makes these villagers dependent on non-emergent services, access to transportation, a cost burden to communities that are generally financially challenged already, and risks that can be fatal in emergent situations. Once again, the poorest and most rural areas are left for last.

Culture and Tradition-

Failing to take into account cultural and social factors when implementing interventions in diverse ethnic populations, can limit or negatively affect the efficacy of the programs delivered.⁸ This is particularly important when considering rural areas that often have their own unique cultural practices, traditions and religions. A report by the *Commonwealth Fund* defines cultural competency as “the ability of systems to provide care to patients with diverse values, beliefs and behaviors, including tailoring delivery to meet patients’ social, cultural, and linguistic needs”.^{9(p2)} Increasing cultural competency can be linked to increased quality improvement of these programs and health outcomes through helping to eliminate racial and ethnic disparities.⁹ Many aspects of one’s life such as individual values, beliefs, and health behaviors are shaped by

characteristics that include socioeconomic status, language, ethnicity, education, and capacity to perform both physically and mentally.¹⁰ When health care programs and interventions can be structured around these elements and take them into account in the development and delivery of their content, diverse populations can receive the most effective healthcare benefits.

Culture, ethnicity, and cultural competence are all inter-related. Many people wrongly associate ethnicity to physical attributes, such as skin color, however ethnicity does not entail any biologically differentiated 'races'.¹¹ However, one must realize there are many cultural, religious, and linguistic differences within ethnic groups.¹² This is one issue that arises when trying to implement interventions in multiple countries, without giving consideration to these various factors. Within each ethnic group, there are beliefs, values, behaviors that are learnt and shared.¹³ These shared practices and values create a sense of belongingness for members of these ethnic groups, helping to keep a culture alive. Culture is important in relation to health care, because it affects the way in which members of a group communicate, interact with health care practitioners, as well as how customs and religious values are upheld and might reflect in healthcare behaviour.¹⁴ How each individual perceives, expresses, and reacts to health events are largely influenced through the culture they identify with. Through responding to the particular needs of racial and ethnic minorities, service uptake and satisfaction could be increased by the users of the healthcare systems. Creating this trust and use of the healthcare system is important in eliminating health care disparities among many rural populations.¹⁰

Measuring maternal mortality-

Some of the biggest hurdles in curbing maternal mortality have to do with the lack of consistent measurement, misclassification of deaths, and lack of resources to measure deaths. These issues are inherent to resource-limited countries, which are also where the need to target

these issues are the greatest. Effective measurement is necessary in order to find what types of interventions to implement, as well as measuring their effects over time. As Cross *et al.*, stated, “...what you count is what you target”.¹⁵ Funds will not be allocated to these issues if there is not an accurate, documented need for it. This is of particular importance in regions where resources are scarce and funding is often hard to come by.¹⁵

Currently, many countries and sources tend to group all maternal deaths together, rather than differentiate between different categories of death. The International Classification of Diseases (ICD), 10th revision, made efforts to re-classify maternal death using two categories: direct and indirect maternal death.¹⁵ Direct maternal death is due to new complications from childbirth, such as hemorrhage, sepsis or eclampsia. Indirect maternal deaths are due to some pre-existing conditions, such as malaria or HIV/AIDS.¹⁵ As one can see, these are two very different classifications that are important to note when evaluating what kind of intervention should be implemented. For example, do more skilled birth attendants with additional training need to be present at births to help decrease the direct deaths of maternal mortality? In contrast, does an educational intervention on safe sex and management of HIV/AIDS need to be implemented? A universal effort in utilizing this classification system is essential when looking towards the future of maternal health.

Even with this classification system of death, it is still possible to misclassify a cause of death. The only official way to determine the cause of death is from an autopsy, which is not plausible in many resource-limited countries.¹⁵ Another issue that arises in these countries is that many deaths occur at home, not in a healthcare facility where it would be recorded. Many deaths go unrecognized, particularly in rural areas of countries that lack access to healthcare.¹⁵ To complicate things further, there are many situations in which crisis situations hinder the

collection of health outcomes such as emerging humanitarian crises, war, or natural disaster situations. Sadly, many countries in which maternal health is a goal to target, is not realistic when faced with these realities for the immediate future.¹⁵

Methods:

A literature search for information in this paper was conducted through the databases of PubMed, Google Scholar, and ProQuest. The following words and phrases were used to retrieve relevant literature from article titles: “maternal mortalit*” + rural + intervention*, “maternal death*” + rural + intervention*, rural + maternal + health + intervention. Quotes around maternal mortality and maternal death were also used to help narrow the search field to more relevant results. An asterisk (*) was used as a truncation character in the PubMed and ProQuest databases in order to achieve all plural versions of those words, widening the search further. The word ‘intervention’ was deemed necessary to include in the search terms in order to retrieve the most relevant results. Upon looking at search terms used, it was also found to be more relevant to widen the search of the word ‘intervention’ to the abstract for relevance of articles retrieved.

After the initial search was conducted, articles were sifted by title, abstract and then by full paper text. Full text articles not available online were requested through the Augsburg Lindell Library. For articles to be included in this review, they must have met the following criteria:

1. Implemented an intervention targeting maternal health or maternal mortality outcomes in a resource-limited country.
2. Published after 01-01-2009 (last 10 years) in order to evaluate the most current interventions.
3. State the intervention was implemented in a ‘rural’ area in some sort of capacity in the title or abstract.

4. Articles published in languages other than English were excluded.

Articles deemed credible were then sub-grouped into categories for evaluation. Their interventions and outcomes were then analyzed and summarized for the discussion portion of this literature review.

During the month of July, 2019, part of the Augsburg Physician Assistant Program had the opportunity to travel to Costa Rica to learn about the country's healthcare, politics, and history. Interviews were conducted at various sites and cities. While in San Jose on July 1st, an interview with Dr. Jose Alejandro Madrigal Lobo of the Costa Rican Doctors Association about the Costa Rican healthcare system was conducted. Another interview was had while visiting the village of Boruca- a small, indigenous community in the rural mountains. The class had the privilege of speaking with community elder, Randall Fernandez Gonzalez, while touring the local Ebais (health care center) and conducted interviews about health care in a rural setting, with a particular focus on maternity health care.

The World Health Organization and the United Nations websites were used for the most up-to-date statistics on maternal mortality rates and data in rural areas of resource-limited countries.

Discussion:

Although efforts to curb maternal mortality rates have increased in recent years, more still needs to be done. Identifying interventions that have been implemented and what factors of those interventions have made them effective or ineffective, is crucial in moving forward with the future of maternal health. Throughout the search of literature on this topic, it was noted studies were few and far between until the mid-1990's. The increase in awareness and urgency, further spurred by the Millennium Development Goals, helped to highlight the need for research in this area.⁴ Many of the studies throughout this decade were encompassed around

implementing potential new surveillance systems and ways to track or classify maternal deaths. Yet globally, many inequalities in data availability remain, as only 51% of countries have some data on maternal causes of death.⁴ Countries who were able to classify maternal deaths, poured research and time into what is causing maternal deaths. These crucial studies have helped to lay the groundwork for research on maternal health today, allowing some countries to move forward with carrying out experimental interventions. Sadly, this mainly applies to countries that have had the resources and the means in order to conduct this preliminary groundwork, leaving many mothers to gamble their lives with each pregnancy.

One method of intervention that countries have been implementing and examining its effects, are the use of Maternal Waiting Homes (MWH). It has been well established, that women of rural areas are much more likely to die because of pregnancy or delivery complications, than women who come from urban areas, much of which can be due to lack of adequate resources.^{16 -17} Education and early antenatal care play a vital role in decreasing both maternal and child mortality.¹⁶ Women often go to these homes for antenatal care throughout their pregnancy. This is key to recognize high-risk pregnancies. Assessing for high-risk pregnancies early on, factors such as distance and lack of adequate resources can be overcome. Often, for their third trimester, many women from rural areas live in these homes waiting to give birth while receiving obstetric care and timely admittance to hospitals for delivery, as MWHs are buildings built near health facilities.¹⁶

A systematic review of nine studies assessing maternal mortality and stillbirth rates using MWHs in rural, resource-limited countries, found great promise in the use of this intervention. Overall, MWH users had a better outcome in decreasing both of these rates significantly, over non-MWH users.¹⁶ The largest study of MWHs to date took place in rural Ethiopia, with 24,124

pregnant women. The maternal mortality ratio (MMR) was 89.8 per 100 000 live births (95% CI, 41.1–195.7) for women in MWH and 1333.1 per 100 000 live births (95%CI, 1156.2–1536.7) for non-MWH women.¹⁸ A high proportion of MWH women were required to deliver through caesarean section (38.5%) due to their high-risk status when compared to non-MWH women (20.3%). This signifies the importance of recognizing complications early in order to prepare for a delivery that may need higher levels of care, which could be the difference between life or death.

A best practice of MWHs has yet to be established due to large heterogeneity for comparison among studies.¹⁶ One common theme that appeared, is research in this area of obstetrics has been significantly impacted by the low numbers of study participants to find significant results, as the utilization of these homes is highly dependent upon where and how they are implemented.¹⁷ MWHs implemented with the input of the local community, giving consideration to specific traditions and cultural components, have been found to be more successful in the number of users.^{16,17} Some ways cultural competence in healthcare can be incorporated is by recruiting and collaborating the design of interventions with local staff, and incorporating cultural-specific components.¹² All are ways that can help contribute to breaking down these long-held health disparities within systems, to increase the effectiveness of maternity health interventions. Especially in countries with high maternal mortality rates, the value of understanding maternal health practices, beliefs, and traditions has been found to play a vital role when developing culturally appropriate interventions.¹² This was identified as a key factor in the community of Boruca, Costa Rica.

On July 5th, the Augsburg Physician Assistant program had the opportunity to visit a rural Ebais in the Boruca community of Costa Rica. Community elder, Randall Gonzalez, spoke

of the importance of having a local Ebais in the community and what a difference it has made in recent years. Until 1998, there were no accessible roads into Boruca, making accessing adequate healthcare difficult. While the nearest care facility outside of Boruca is in Buenos Aires province, 40 minutes by car, the facility lacks maternity services. Expecting mothers must therefore seek care from the town of San Isidro, one and a half hours away. This is clearly a burden on families in the community, where many of them do not own vehicles or have a steady income to afford regular transportation to San Isidro. This leaves many women in the community with little choice, but to give birth at home in Boruca with the care of a local midwife. These midwives come from the community and sought specific training to deal with common birth complications. Many expectant mothers feel more at ease with someone they know and trust, and who in return is familiar with them on a personal level. According to Randall, of the twenty births in the last year in the community, eleven of those have been safely performed at home. Many claim the treatment from the midwife in their own home is better, because the midwife will cater to their specific needs, using a combination of ancestral practices of herbs and remedies with modern medicine. Many mothers feel like their beliefs are not respected in the modern health care system, even though it may be the safer option. Through combining both holistic medicine with modern day practices, the utilization of the Ebais by members in the community has increased greatly knowing they can receive a natural remedy if they wish, while still being monitored by healthcare professionals.

Another resource some countries are experimenting with implementing, are combinations of antenatal care packages through skilled birth attendants in the community (also known as community intervention packages). These packages include combinations of antenatal care checks, pregnancy education (in various capacities), and a birthing plan, all being carried out by

skilled birth attendants. A systematic review examining 26 randomized control trials that conducted community based intervention packages, assessed the outcome on maternal and child morbidity and mortality.¹⁹ The meta-analysis of these studies found significant reductions in maternal morbidity (25%), child morbidity and child mortality, but not maternal mortality.¹⁹ This was surprising as it contradicts what current literature has led us to believe. Increasing education during the antenatal period and antenatal check-ups, should decrease maternal mortality according to some previous research.¹⁶⁻¹⁸ This indicates that there are possibly other factors playing a role in these studies that must be accounted for, elaborating on the multi-faceted nature of this topic. An interesting theme that appeared among the studies included in this review, revealed community intervention packages did not increase the attendance of having a skilled birth attendant present during the delivery or having a delivery in a healthcare facility.¹⁹ As stated earlier, having a person who has training in childbirth and delivery has been shown to reduce maternal mortality, as most causes of maternal mortality are preventable.^{4,6} It appears community based intervention packages do not provide what appears to be a valuable component of maternal mortality through providing timely, skilled access to both personnel and facility, like MWHs do. The lack of significant results should not discount the importance of community-based intervention packages, however. Clearly there is some value in their benefit to neonates and helping to reduce morbidities for future mothers.

A major limitation, simply implementing an intervention does not go far enough as current research displays. Taking into account all of the factors that also play a role in the utilization of an intervention, such as adequate resources to provide transportation, access to knowledge, and respect for culture/traditions are all valuable components. If more interventions took these factors into consideration when designing their plan, perhaps the use and uptake of

their services would help contribute meaningful research to this field. Too many studies have too few participants in order to truly see the effect of the intervention. Perhaps, the most valuable component this literature review has found is the importance of having a doctor, midwife, or skilled nurse present at the birth. As previous data has shown, the majority of maternal deaths are preventable if proper care is given in a timely manner before, during and after birth. This is where future recommendations need to be targeted. While it is difficult to compare maternal health interventions with so many varying components around receiving this care, MWHs show great promise in doing so. Research of MWHs needs to be conducted on a larger scale, with greater consideration given to their homogeneity in order to better compare elements of these homes and determine their efficacy. However, in order to carry this research forward, countries of the world must prioritize funding. A collective effort by low, middle and high-income nations needs to take place, in order for mothers to have the same chance at life, no matter where they live.

Conclusion:

Maternal mortality continues to plague resource-limited countries, particularly in rural areas. Disparity among low and high-income countries still remain noteworthy due to a number of barriers that exist for pregnant mothers seeking adequate healthcare. The Millennium Development Goals have brought much needed attention to this urgent tragedy that continues to happen every day. Strengthening many developing countries capacities in obtaining health-related data is the first step to help allocate adequate resources toward funding interventions. Without this, countries cannot implement and measure the effect of interventions.

While the significance of MWHs in particular still needs to be explored further, the current research shows the promise this intervention has in reducing maternal mortality in rural, resource-limited settings, possibly due to the timely care of a skilled birth attendant. The studies thus far that have implemented a MWH or community-based intervention package, show the importance of addressing common rural barriers are as important as implementing the intervention itself. Enhancing available resources, considering input from the community, and giving respect to the local culture are paramount to the future success of maternal health utilization. Taking these findings and recommendations seriously is possibly the only hope to meet the global maternal mortality Sustainable Development Goal target for 2030. Mothers cannot afford for us to fail to meet our goal, yet again.

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