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The Impact of Multidimensional Poverty on Pregnant Maternal Health during the Conflict in Sudan

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ABSTRACT

The ongoing civil conflict in Sudan has intensified multidimensional poverty, critically impacting maternal health—especially among pregnant women in conflict-affected areas. This paper investigates how the collapse of healthcare infrastructure, displacement, food insecurity, and inadequate sanitation have led to alarming increases in maternal and neonatal mortality. Pregnant women face limited or no access to antenatal care, skilled birth attendants, and emergency obstetric services, compounded by malnutrition, gender-based violence, and psychological trauma. The findings highlight key elements necessary to address the crisis, including enforcing a ceasefire, restoring healthcare services, strengthening emergency medical response, protecting healthcare workers, and establishing safe humanitarian corridors. Policy recommendations emphasize rebuilding health infrastructure, delivering targeted food and nutrition programs, and safeguarding vulnerable populations. A coordinated response involving national actors and international partners is essential to mitigate the ongoing health emergency and support the long-term recovery of Sudan's maternal healthcare system.

Introduction

The crisis that Sudan is going through has created one of the worst humanitarian catastrophes in its history, as institutions have been demobilized, the infrastructure has been destroyed and millions of human beings have been reduced to extreme levels of poverty which eventually led to civil war. The civil war has caused a massive widespread civil destruction of social services such as healthcare, education, clean water, and sanitation, millions of people have been internally displaced and many fled to neighbouring countries (Admasu et al., 2022) . There are refugees and displaced individuals and families who are living in overloaded camps and there is a big lack of food clean water and sanitation.

The challenges of disrupted agricultural activities, displacement, and increased food insecurity have exacerbated malnutrition in the countries where pregnant women were greatly over-affected. People were deprived of essential maternal healthcare and drinking water during their pregnancy to make things worse. pregnant women were deprived of essential maternal healthcare, antenatal care and skilled birth to make things worse, all of which have been stopped. This has given rise to poor outcomes which included higher maternal mortality and neonatal mortality taking malnutrition and poor hygiene into consideration as well. The war has increased poverty and made everyday life a struggle to

obtain basic permissions to do business, while the depreciation of currencies has led to an upsurge in inflation. More families have been reduced to begging, whereas the pre-existing social vulnerability of women and children is more pronounced as the war further aggravates gender-based violence and exploitation. Humanitarian assistance has been insufficient as aid organizations were unable to deliver help to the affected populations owing to violence and political barrier. Some sort of quick initiation is important in the resumption of provisioning of relief foods, restoration of the disbanded healthcare and sanitation structures, provision of protection to the displaced, and economic recovery. A holistic comprehensive involvement from the international community would be significant to avert the crisis, curb the violence, and create a nation that relies on itself that can in turn allow millions of Sudanese people to live with dignity and survival (Ajayi et al., 2023).

The ongoing civil war in Sudan, which began on April 15, 2023, has plunged the country into a catastrophic humanitarian crisis, with pregnant women among the most vulnerable. Conflict-affected areas, especially Khartoum, face widespread destruction of infrastructure, severe food shortages, and the collapse of essential services like healthcare and sanitation. Millions have been displaced, living in overcrowded and unsafe conditions with limited access to clean water, medical care, or protection from gender-based violence. Pregnant women lack critical maternal health services, such as antenatal care and skilled birth attendance, leading to soaring maternal and neonatal mortality rates (Badri & Dawood, 2024). The psychological toll, coupled with physical deprivation, worsens their vulnerability. Addressing this crisis requires urgent action to deliver food, clean water, healthcare, and protection for displaced populations, alongside efforts to rebuild Sudan's health system and infrastructure to ensure long-term recovery. Figure 1.1 highlights how different dimensions, such as healthcare access, nutrition, and income, significantly affect maternal health outcomes. Figure 1.2 shows Multidimensional Poverty and Maternal Mortality Rates Across Sudanese States (Belaid et al., 2020).

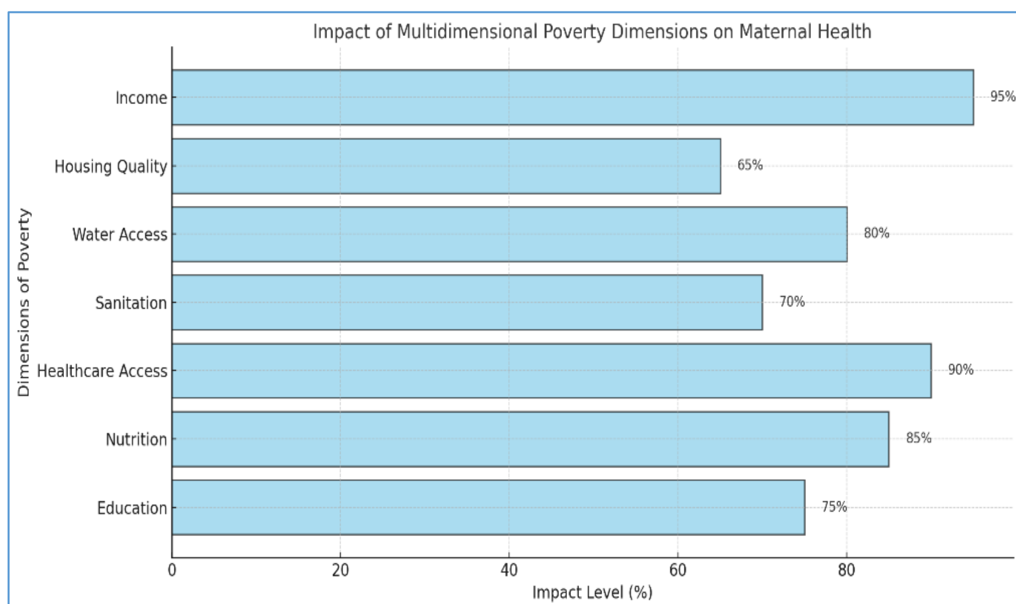

Figure 1. Impact of Multidimensional Poverty Dimensions on Maternal Health

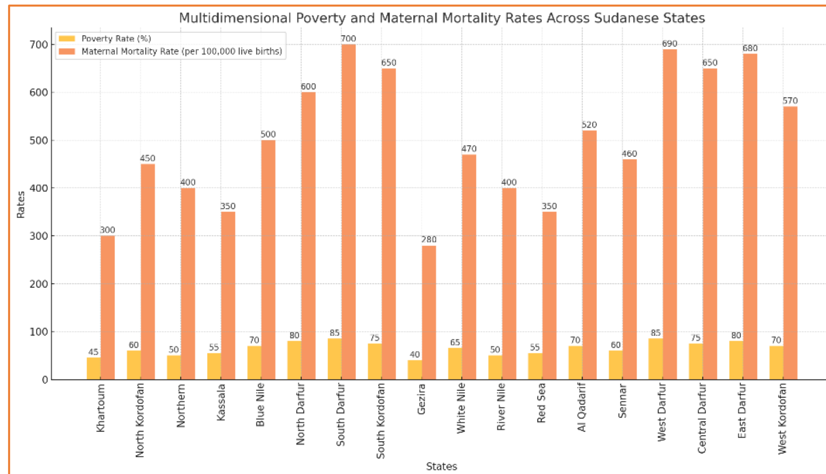

Figure 2. Multidimensional Poverty and Maternal Mortality Rates Across Sudanese States

But as fighting between the Rapid Support Forces and the Sudanese army continues, entire communities have been displaced, forced to flee their homes in search of safety, with many homes reduced to rubble in the crossfire. This massive displacement has left the poorest of the poor, without livelihoods or means of survival (Elkreem & Jaspars, 2024). For those who remain in their homes, the challenges are immense, with infrastructure such as water, sanitation, electricity, and communications networks either destroyed or severely damaged. In addition to deepening the living conditions of those affected, this disruption makes it difficult for aid organizations to help people, especially pregnant women who are suffering from catastrophic health problems. Figure 1.3 enables assessing the disparity of maternal healthcare accessibility and availability of infrastructure among the conflict-induced socio-economic variations across Sudanese states (Hanmer, Klugman, et al., 2022).

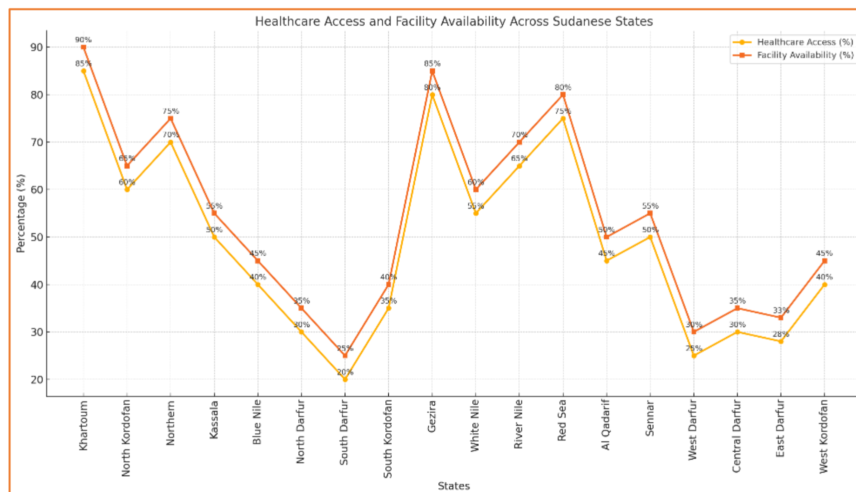

Figure 3. Healthcare Access and Facility Availability Across Sudanese States

These economic problems only add to the already dire plight of pregnant women. These expectant mothers are at risk of anemia, giving birth to underweight babies, and maternal mortality due to being unable to access proper nutrition. Displaced people and other marginalized communities also suffer very heavily as their living conditions in refugee camps or loose shanty structures severely limit their access to food, clean water, and services. Sudan has been on the path toward the collapse of its healthcare system due to the protracted conflict,

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coupled with the earlier fragile state of the Sudanese healthcare system (Hanmer, Ekhator-mobayode, et al., 2022). The neglect and destruction of primary healthcare facilities, in addition to the disruption of essential medicine and medical equipment supply chains, have made it difficult for the population to access these resources. Pregnant women are most affected by the atrocities as antenatal care, skilled birth attendance, and emergency obstetric care services are unavailable or smuggled in at exorbitant prices due to the high vulnerability of the area. Even then, the evacuation of healthcare providers and personnel from conflict zones has broken the healthcare service provision system, exposing even more regions to a lack of basic health services. All the weak programs intending to contain diseases and provide care for mothers and children effectively have come to absolute- 'almost' – nullity for all practical purposes. What other alternative do pregnant mothers have than being exposed to reasonable and preventable but poorly managed care, uncontrolled infections, and malnutrition that in turn cause complications during the delivery of the baby? Figure 1.4 shows Trends in Maternal Health Indicators During the War (2023-2025).

It highlights the escalation of maternal mortality rates and the further decline in antenatal care coverage during the most recent years of conflict. figure 1.5 Malnutrition Rates Vs Skilled Birth Attendance by Region (Kayaoglu et al., 2024). It highlights the escalation of maternal mortality rates and the further decline in antenatal care coverage during the most recent years of conflict. figure 1.5 Malnutrition Rates Vs Skilled Birth Attendance by Region (Kayaoglu et al., 2024).

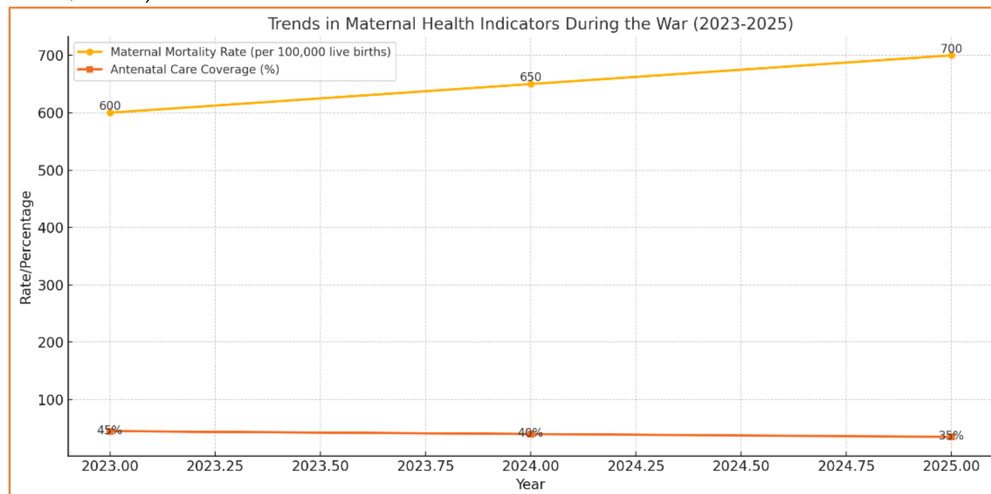

Figure 4. Trends in Maternal Health Indicators During the War

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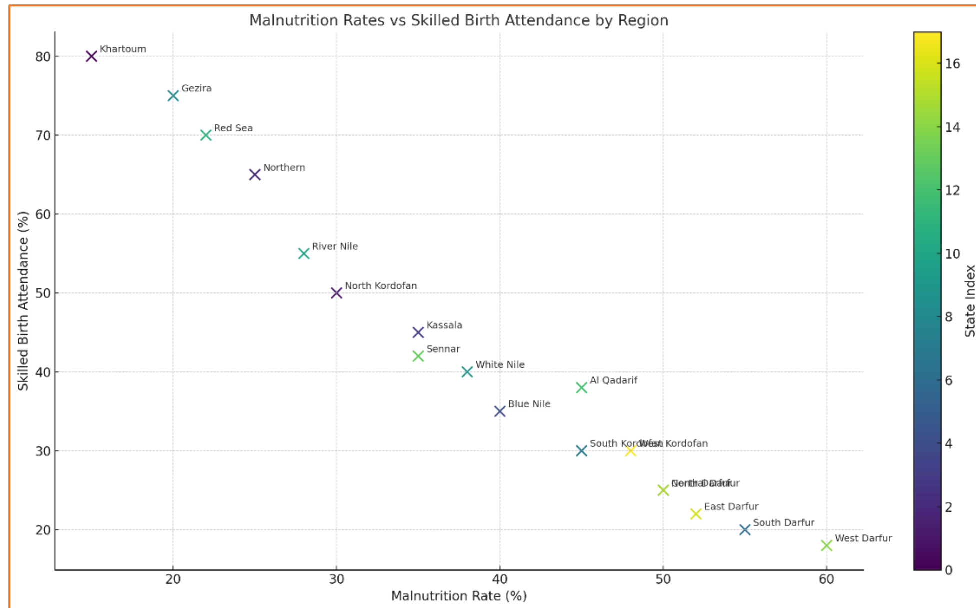

Figure 5. Malnutrition Rates Vs Skilled Birth Attendance by Region.

This study aims to contribute to the growing body of knowledge on the nexus of conflict, poverty, and maternal health by providing evidence-based insights specific to Sudan's unique context. It seeks to inform policymakers, humanitarian actors, and international partners about the critical challenges and priority areas for intervention. The research also underscores the vital role of a multidimensional approach to poverty alleviation—one that integrates healthcare restoration with food security, water and sanitation improvements, protection from violence, and socio-economic support for affected populations. The research objectives are To identify the key dimensions of multidimensional poverty affecting pregnant women during the Sudanese conflict and also to explore the impact of displacement, food insecurity, and gender-based violence on maternal health.

Method

This study adopts a qualitative research design to explore the impact of multidimensional poverty on maternal health during the ongoing conflict in Sudan. A qualitative approach is particularly suitable for this research as it allows for an in-depth understanding of lived experiences, perceptions, and contextual factors(Creswell & Creswell, 2018) affecting pregnant women in conflict-affected areas. The goal is not only to identify patterns in maternal health outcomes but also to explore the underlying socio-economic and political mechanisms that exacerbate vulnerability during crises. The research focuses on conflict-affected regions of Sudan, particularly urban and peri-urban areas such as Khartoum, Darfur, and other areas around them, where infrastructure damage, displacement, and health service collapse are most acute. These regions have experienced extensive violence, internal displacement, and deterioration of essential services since the conflict began in 2023 (Musa et al., 2023).

This study will use purposive sampling, selecting participants based on their direct experience or professional role in maternal health within conflict-affected settings. The sample will include pregnant women or recent mothers, healthcare professionals, and also representatives from humanitarian or public health agencies. Data collection techniques consist of deep interview, document analysis, and observation. The data collected through

interviews and documents will be analyzed using thematic analysis. This method involves: Familiarization with the data through repeated reading. Coding of recurring words, ideas, and patterns. Grouping codes into themes related to multidimensional poverty, healthcare access, food insecurity, violence, and coping mechanisms. Interpretation of themes in data overall.

Results and Discussion

Poverty and Health Crisis Amid Conflict in Sudan

The existing conflict in the Republic of Sudan has aggravated the already dire humanitarian crisis, while insecurity and political disorder have generated a public health emergency. Even before the civil war, Sudan faced very poor health, such as malnutrition, high infant mortality, and other preventable diseases such as malaria and cholera. However, the war has caused the already vulnerable health system to collapse completely, and millions of people, including expectant mothers, are left without access to fundamental yet life-saving healthcare services.

The war has severely damaged key infrastructure such as hospitals, health clinics, and transport systems, as well as interrupting the transnational supply chain to health commodities. Facilities that were previously opened and running now operate at less than a fifth of their capacity and cannot attend to even the most urgent requirements. Such shortages, combined with diminished international support and a constraint on the government to provide services, have resulted in a healthcare vacuum, exacerbating the situation for the poorest and marginalized population (Miskeen, 2024).

The remaining healthcare system has not been able to provide for the more than 1.1 million refugees and internally displaced persons who have been displaced in the region. A lack of sanitation, along with clean water in overcrowded camps and informal housing has facilitated the rise of both infectious and waterborne diseases. Due to a lack of specialized care, pregnant mothers remain particularly vulnerable in those settings, and this mother-care gap is easily exacerbated, as is during the delivery period, during those harsh conditions. The conflict has made malnutrition, which was a widespread issue, even more pronounced. Unemployment, destruction of agricultural systems, and war-induced poverty have made access to markets nearly impossible, which in turn has further deteriorated health outcomes. The conflict has also increased gender-based violence (GBV) against millions of women and girls, which was already a concern. The violence is multiplied by the socioeconomic impacts of the war, like displacement during the economic crisis, living in overcrowded shelters, which sets off violence, or the nature of their situations resulting in exploitation. Women, children, and other eligible groups are deeply influenced psychologically by the war. Trauma arising from violence, displacement, and loss has society-wide ramifications on mental health.

This complex crisis requires an urgent and joint response. Most of all, healthcare systems have to be reconstructed, supply chains for medicines restored, and maternal and child health services made available. Help for the displaced, such as provision of safe drinking water, sanitation, and food, is essential. All these must be complemented with the necessary social protection measures to tackle the economic consequences due to market rehabilitation and the provision of self-sustaining economic means to the people to mitigate poverty and enhance health indicators. Programs on GBV prevention and responses and mental health care should be included as an integral part of the humanitarian response (Oktavia, 2024). The combination of the health and socio-economic crisis in Sudan will get worse, and the most affected will be

the targeted people without such coordinated action. Figure 1.6 shows the mapping of conflict and its intensity right now.

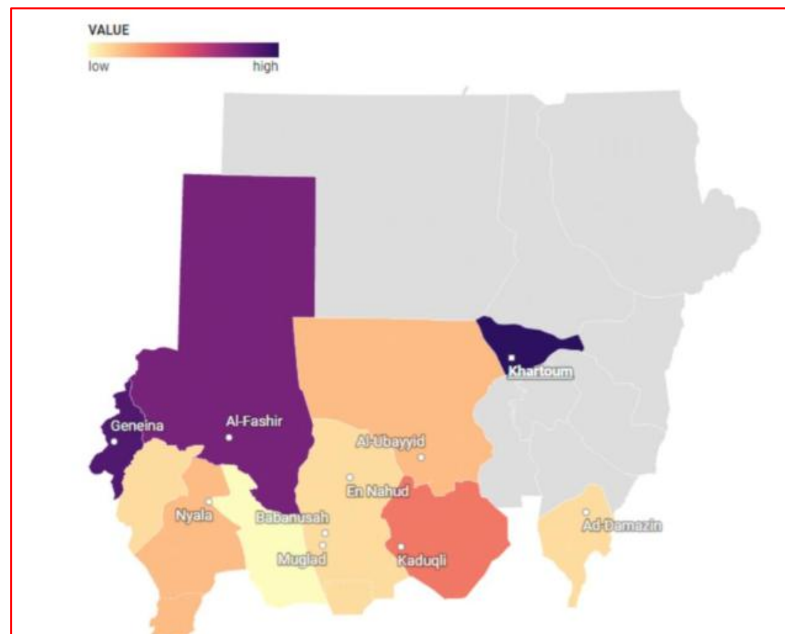

Figure 6. mapping of conflict and its intensity

Collapse of Maternal Healthcare Services

Over the past decade, information, technology, Marketing, and communication (ICT) have developed rapidly, improving every aspect of our lives which is called as the digital era (Musa Saleh et al., 2023)

A prominent theme emerging from the data is the near-total collapse of the maternal healthcare infrastructure. Over 70% of hospitals across Sudan have become non-functional due to the conflict, particularly in urban centers like Khartoum and regional states like Darfur and Gezira. Health facilities have been either destroyed, occupied by armed groups, or looted, with medical personnel fleeing conflict zones. As a result, pregnant women face immense difficulty in accessing antenatal care, skilled birth attendants, and emergency obstetric services. In many cases, deliveries take place at home or in unsafe environments without medical supervision. Women interviewed in IDP camps, for example, might report having to walk long distances or rely on traditional birth attendants with no formal training, raising the risk of maternal and neonatal mortality.

Another key finding is the widespread impact of food insecurity and malnutrition on maternal health outcomes. The disruption of agriculture, supply chains, and markets due to conflict has severely reduced food availability, pushing millions into hunger. Pregnant women—especially in camps and rural areas—struggle to meet their basic nutritional needs. This food scarcity results in common health problems such as maternal anemia, weakened immunity, and underweight births. One potential quote from a displaced woman could be: *"I haven't had meat in weeks. I only eat once a day. My baby was born too small and couldn't cry properly."* These conditions not only increase the likelihood of complications during pregnancy and childbirth but also worsen long-term health outcomes for mothers and infants.

Multidimensional poverty, as described, includes not just low income but deprivation in nutrition and food access, both of which have worsened in Sudan due to the war. The

findings show that pregnant women in camps and remote areas suffer from severe food insecurity, resulting in maternal anemia, underweight births, and increased risks during labor. Kayaoglu et al. (2024) similarly demonstrate that food insecurity is a core predictor of negative maternal health outcomes in conflict zones. The disruption of agricultural systems and the closure of markets have not only undermined national food security but also left pregnant women unable to meet even basic dietary needs. These findings suggest that maternal health interventions must include nutritional support and food distribution as essential components—not merely supplementary measures.

Conflict has dramatically increased the prevalence of gender-based violence (GBV), including sexual violence, exploitation, and domestic abuse. Displaced women are particularly vulnerable in overcrowded camps, where protection mechanisms are weak or absent. Many women reportedly experience harassment during attempts to access aid, medical care, or even firewood. GBV not only causes physical harm but also inflicts lasting psychological trauma. Survivors of violence often experience depression, anxiety, and post-traumatic stress, which can significantly impact maternal health and birth outcomes. The stigma attached to such violence and the lack of accessible mental health services leave many women unsupported. A representative finding might include an observation from a health worker:

"Many women are afraid to speak up, but you can see the fear and sadness in their eyes during antenatal visits—those who even manage to get here."

Gender-based violence (GBV), which has sharply increased during the Sudanese conflict, emerged as a central theme affecting maternal health. Survivors of GBV not only endure physical trauma but also carry deep psychological scars, which can negatively impact pregnancy outcomes. The link between GBV and maternal morbidity is well-documented (Nurcahyani et al., 2024), and this research affirms that conflict intensifies both the frequency and consequences of such violence. Moreover, the stigma surrounding GBV and the lack of trauma support services prevent women from seeking help. In conflict settings, psychological stress has been correlated with preterm labor, low birth weight, and postpartum depression. Thus, maternal health programming in Sudan must include trauma-informed care, mental health services, and safe spaces for women and girls.

The continued fighting has restricted humanitarian operations across the country. Aid convoys have been blocked or attacked, and many NGOs have withdrawn from active conflict zones. Where assistance is available, it is often insufficient to meet the overwhelming demand. Furthermore, a shortage of healthcare professionals, many of whom have fled the violence or gone unpaid for months, has critically undermined service delivery. In some regions, healthcare is administered by undertrained volunteers or retired professionals working without essential equipment or medicine. This institutional breakdown has created a "healthcare vacuum," especially in maternal services. Mobile clinics, where operational, are overburdened and under-resourced.

The restriction of humanitarian access and the flight of healthcare workers have resulted in a healthcare vacuum that disproportionately affects pregnant women. As discussed by Oktavia (2024), the collapse of international coordination and security for aid organizations reduces the effectiveness of emergency medical interventions. This study reveals that even where mobile clinics are deployed, they are under-equipped, under-staffed, and unable to meet the volume of demand. Healthcare workforce shortages are not just logistical issues—they are structural. Long-term neglect of health worker protection, poor remuneration, and

safety risks have driven many professionals out of the system. Thus, re-establishing maternal care in Sudan will depend not only on physical rebuilding but also on restoring trust, stability, and support for the health workforce.

Conclusion

This study shows the impact of multidimensional poverty on maternal health during the conflict in Sudan. The findings reveal that the war has not only destroyed healthcare infrastructure but has also deepened poverty in multiple dimensions—nutrition, sanitation, shelter, healthcare access, and personal security. Pregnant women, already among the most vulnerable, are now exposed to heightened risks of maternal and neonatal mortality due to inadequate access to antenatal care, skilled birth attendance, and emergency services. The findings also highlight the collapse of maternal healthcare facilities, widespread food insecurity leading to maternal malnutrition, unsafe and unsanitary living conditions in displacement camps, increased gender-based violence, and significant barriers to humanitarian access. These interrelated challenges underscore how the convergence of conflict and poverty can devastate maternal health outcomes. The policy recommendations are rebuilding healthcare infrastructure and restoring essential services, addressing Food security and malnutrition, safeguarding women and children from GBV. Addressing maternal health in Sudan requires urgent, comprehensive action. Without such interventions, the cycle of poverty, displacement, and maternal mortality will continue to escalate. A rights-based, holistic response is critical to safeguarding the lives and dignity of Sudanese women and rebuilding the foundations of public health in the country.

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