
Unveiling Maternal Mortality Challenges in a Resource Limited Setting, Ethiopia: A Systematic Literature Review

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ABSTRACT: *By combining data from five carefully chosen studies completed between 2014 and 2023, this systematic review aims to assess maternal mortality rates, risk factors, and related variables in Ethiopia. A thorough search of electronic databases was done, including PubMed, Scopus, and Google Scholar. Utilizing predetermined criteria, eligible studies were found, which led to the inclusion of studies carried out in various Ethiopian regions. A thorough quality assessment was done to make sure the chosen studies were reliable. Maternal mortality rates, primary and secondary risk variables, and systemic, socioeconomic, and cultural factors influencing maternal mortalities were all extracted from the data from these studies. In Ethiopia, the research found large regional variations in maternal mortality rates, with obstructed labor, postpartum hemorrhage, and hypertensive disorders of pregnancy emerging as the main risk factors. Disparities in education, age, living in remote areas, and restricted access to antenatal care services were secondary concerns. Notably, limited antenatal care services, rural residence, young maternal age, and a lack of education were linked to increased maternal death rates. The ongoing problem of maternal mortality in Ethiopia is highlighted by this systematic review. Even though there have been gains, particularly in metropolitan areas, there are still significant regional differences. Increasing access to high-quality healthcare, especially in rural areas, boosting education, and increasing the use of antenatal care are just a few of the multidimensional initiatives needed to address maternal mortality. In order to minimize maternal mortality and ultimately move Ethiopia closer to achieving Sustainable Development Goal 3, comprehensive and targeted policies must be put in place.*

KEYWORDS: Challenges, threats, risks, maternal mortality, maternal deaths, Ethiopia, Systematic review.

INTRODUCTION

A significant global health problem, maternal mortality disproportionately affects areas with limited resources. In terms of public health, this problem intersects with socioeconomic inequalities, gender imbalances, and healthcare delivery. Maternal mortality, a major challenge in worldwide development, is related to Sustainable Development Goal 3 (SDG 3), which aims to "ensure healthy lives and promote well-being for all at all ages." According to the UNICEF (2019), one of its specific targets, 3.1, aims to lower the worldwide maternal death ratio to fewer than 70 per 100,000 live births by 2030. Although Ethiopia, a nation known for its resource shortages, has made headway toward this goal, there are still significant obstacles that stand in the way.

According to World Health Organization (2023), globally as of 2020, 287,000 women died from events related to pregnancy and childbirth, equivalent to 800 women dying every day or one maternal death occurring every two minutes, sub-Saharan Africa accounting for about 70%. According to UNFPA (2023), Ethiopia achieved a reduction of 459 maternal death in 6 years to become 412 per 100,000 live births in 2016. Inferably as estimated by the World Bank Group (2023) on maternal mortality trends in Ethiopia, there was a drop by 73, 245, 236 and 132 maternal deaths per 100,000 livebirths in the year range 2000-2005 and 2005-2010, 2010-2015 and 2015-2020, respectively. Over these two decades, it appears there was a steeply drop in rates of maternal death in the first decade and tends to gradually plateau in the next decade. Presently at 267 per 100,000 (2020) live births which is appreciably above the average of 409 per 100,000 livebirths for low-income countries, and significantly higher than the average of 12 per 100, livebirths for a high-income country for the same year 2020 estimates. Such a disparity can hardly be imagined.

The Republic of Ethiopia, located in the Horn of Africa, still has a significant high maternal mortality rate. A multifaceted strategy focusing on healthcare accessibility, the standard of prenatal and postnatal treatment, and educational interventions is needed to address maternal mortality in Ethiopia from the perspective of public health practice. In addition to being a national tragedy, the high prevalence of maternal mortality represents a substantial obstacle to reaching SDG 3, which influences the nation's prospects for overall development (Berhan & Berhan, 2014).

Within the larger context of public health promotion and intervention, this systematic review focuses on proffering understanding to the risk factors causing maternal death in Ethiopia. We seek to discover the factors that increase the risk for maternal fatalities by examining the body of available literature. This practice serves two purposes. First, to provide the Ethiopian government and international organizations with a thorough analysis of the obstacles that now prevent the realization of SDG 3. Second, to make a significant contribution to plans to lower maternal mortality rates and achieve SDG 3 by 2030.

In addition to being a healthcare problem, maternal mortality is a complicated public health issue that necessitates systemic solutions. Social, economic, and environmental factors are frequently included in the factors that determine maternal mortality in addition to clinical concerns (Say et al., 2014). As a result, this review is in line with the practice of mother and child health, a field of public health. The socio-demographic, direct, indirect, medical, and non-medical factors that increase the risk of maternal death will be the focus of this study.

The scope of this systematic literature review is intentionally broad but narrowly focused. It attempts to examine papers, reports, and research from the past ten years that talk about the risk factors for maternal mortality in Ethiopia. By capturing the impact of recent interventions and policy changes, this time span guarantees that the data is relatively current. Peer-reviewed studies, official reports, and works from global organizations like the World Health Organization (WHO) and the United Nations will all be examined as part of our review's analysis of diverse categories of literature.

Purpose of The Study

The purpose of this study serves to carry out a thorough literature analysis in order to find and comprehend the primary and secondary risk factors behind the high rates of maternal death in Ethiopia. It will also serve to provide comprehensive information on the current challenges to achieving SDG 3 for the Ethiopian government and international organizations and make suggestions for improving methods for reducing maternal mortality and attaining SDG 3 by the deadline of 2030. By accomplishing these goals, this systematic review aspires to support the dialogue and measures required for Ethiopia to significantly reduce maternal mortality, supporting national initiatives to reach SDG 3, and contributing to Ethiopia's success.

Research Question

The following research question was answered by the study:

What are the primary and secondary risk factors contributing to maternal mortality in Ethiopia, and how do these risk factors impede the country's progress towards achieving SDG 3 by 2030?

Aim

The main goal of this systematic review is to provide actionable insights that will help achieve SDG 3 by 2030 by thoroughly evaluating and synthesizing the body of literature currently available on the risk factors contributing to maternal mortality in Ethiopia.

Objectives

1. The primary risk factors that directly contribute to maternal mortality in Ethiopia, such as hemorrhage, infection, and eclampsia, should be identified by reviewing the literature.
2. Examine the systemic, socioeconomic, and cultural elements that, inadvertently, contribute to maternal mortality, such as lack of access to healthcare, deprivation, and education.

Rationale for the Study

The goal of this study, which employs the Patient, Exposure, and Outcome (PEO) model, is to identify the primary and secondary risk factors influencing maternal mortality in Ethiopia and their implications for reaching Sustainable Development Goal 3 (SDG 3) by the year 2030. The term "Patient" refers to pregnant women and mothers in Ethiopia, where the maternal death rate was 267 per 100,000 live births as of 2020, appreciably higher than 191 per 100,000 livebirths and significantly more than 12 per 100,000 livebirths which are averages for middle- and upper-income countries, respectively (World Bank Group, 2023). "Exposure" includes risk factors such as sociocultural determinants and poor healthcare access, as well as medical conditions like hemorrhage and sepsis (Berhan & Berhan, 2014) and systemic barriers (Calvello et al., 2015; Say et al., 2014). The "Outcome" has two goals: to comprehend how these risk variables affect maternal death rates (Tegegne et al., 2017) and to assess how they interfere with the realization of SDG 3 (United Nations, 2015; World Health Organization, 2019). Aiming to significantly influence public health policies and initiatives, the study is crucial given the rapidly approaching 2030 SDG deadline (Tessema et al., 2019).

METHODOLOGY

In order to systematically conduct this study, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was adhered to (Moher et al., 2009; Shamseer et al., 2015). Here, to aid in data gathering, qualitative works by other academics in various fields that focused on related subjects to the current study were gathered. This was required to improve the study's findings and their potential to influence practice and policy.

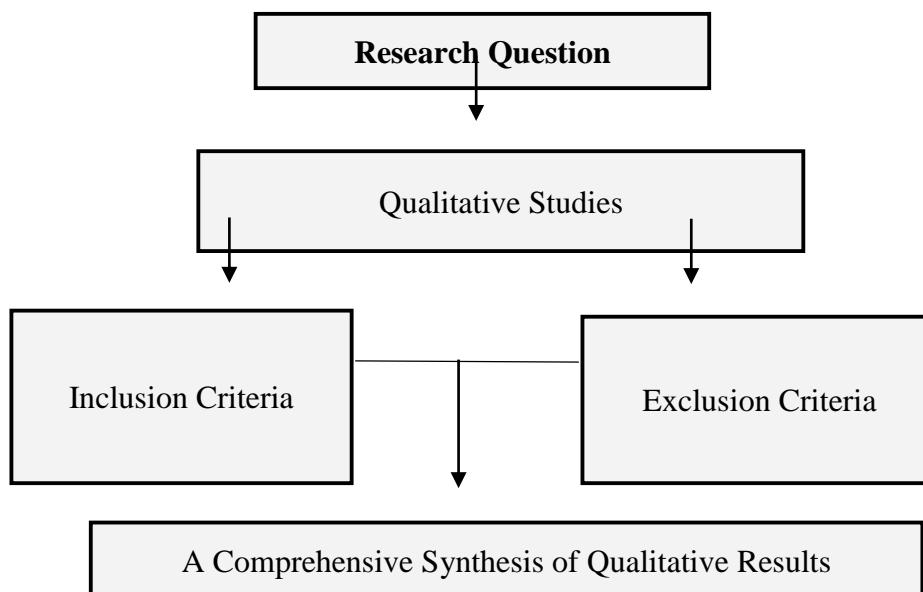


Figure1: Sequential Methodology for Systematic Review

Schematic Representation of the Methodology

While figure 1 above shows the sequence followed in the methodology for the systematic review, figure 2 below shows a schematic representation of the method used in the study to determine the final number of studies that were chosen for inclusion.

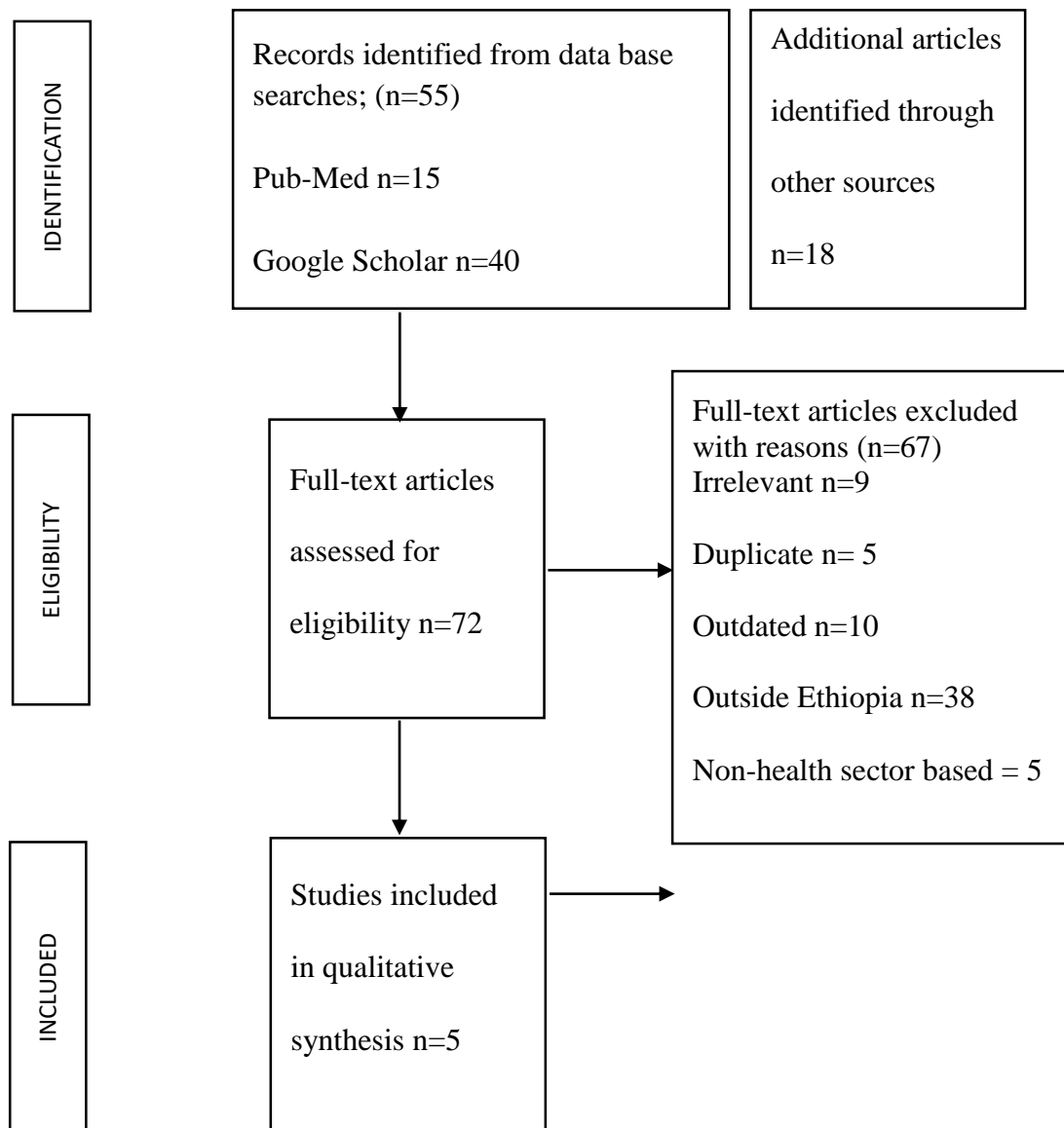


Figure 2: PRISMA flowchart of study selection and screening.

Search Strategy

Preliminary Search

I started by doing a preliminary literature search to validate the study issue under consideration and map the information that was already available. This was primarily done to make sure that no other systematic review of the subject of the study under investigation had been conducted, specifically in Ethiopia. The search yielded two studies that were recent, one of which whose study synthesis incorporated studies that were more than two decades ago (Mekonnen & Gebremariam, 2018; Berhan & Berhan, 2014). A suitable number of databases including PubMed and Google Scholar were searched. Others were Embase and Scopus. Websites of international organizations including the World Health Organization (WHO) and UNICEF were also checked for grey literature (Godin et al., 2015; Greenhalgh & Peacock, 2005).

Searches were done using terms like "Risk Factors," "Ethiopia," and "Maternal Mortality," among others. For more complex searches, Boolean operators like "AND" and "OR" were used (Booth et al., 2016). During this preliminary search, it was quickly realized that adequate qualitative studies were available for review for this study. However, it was further discovered that a systematic review of recent studies on risk factors of maternal mortality in Ethiopia was yet to be conducted which gave validation to the conduction of this study.

Actual Search

Our search strategy was developed using the PEO framework, and the first database checked was PubMed. This was followed by Google Scholar, which made it easier to find relevant articles that addressed the study topic (Booth et al., 2016; Godin et al., 2015). In order to find as many eligible studies as possible, the search technique, devised in partnership with an IT expert, included free-text terms and subject indexing (Sampson et al., 2009). Final Search phrases: The two search phrases that were necessary were "risk factors and maternal mortality" and "risk factors for maternal mortalities."

Protocol Writing: A thorough search was done in several databases, including PubMed, Google Scholar, Scopus, Cochrane, and EMBASE (McGowan et al., 2016). Critical Appraisal Skills Program (CASP) was used as the quality appraisal tool to evaluate the efficacy and applicability of the investigations (CASP, 2018). Studies required to be current (2014–2023), done in Ethiopia, include pregnant women as the target population, and measure risk factors for maternal mortality to be eligible. They also had to use qualitative, quantitative, or mixed methodologies.

Screening of Titles and Abstracts: Screening of the title and abstract was performed to ensure the removal of duplicates and improving the review's quality (O'Connor, Green & Higgins, 2011).

Downloading and Screening Whole Texts: The required studies were mostly accessed and downloaded from PubMed and Google Scholar. According to predetermined inclusion and

exclusion criteria, downloaded studies were reviewed, producing a final list and justifications for exclusions (O'Connor, Green & Higgins, 2011).

Online platforms and databases: The study mainly used the PubMed and Google Scholar databases (Godin et al., 2015). To complement the systematic review, arbitrary web searches were also done (Greenhalgh & Peacock, 2005)

INCLUSION AND EXCLUSION CRITERIA

Peer-reviewed studies that concentrate on Ethiopia's maternal mortality risk factors and were published between 2014 and 2023 were included. Studies were disregarded if not in English language (Hartling et al., 2017), lack of peer review, or lack of Ethiopian focus (Sampson et al., 2009).

Table 1: Criteria for Inclusion and Exclusion of Studies

Criteria	Inclusion	Exclusion
Time Period	2014-2023	<2014
Language	English	Non-English
Setting	Healthcare centers/Hospital based	Completely outside healthcare settings
Location	Ethiopia	Other countries
Aim	Risk factors for maternal mortality	Literatures not incorporating risk factors

Methods of Critical Appraisal

The Critical Appraisal Skills Program (CASP) checklist was used to evaluate the studies (CASP, 2018). This method was used due to its reliability in assessing the value and applicability of each study that was chosen (Burls, 2009). The method of critical appraisal used for the selected 5 studies included topics, aims, methodology, findings and validity.

Type of Analysis and Data Synthesis

A narrative synthesis was appropriate because the examined and selected papers were dissimilar (Popay et al., 2006). Emphasis was laid on identifying risk factors and looking at how they affect maternal mortality in Ethiopia. Considering the SDG 3 targets, the results were then summarized (Tegegne et al., 2017). The first step in the synthesis involved a pre-synthesis that took the form of a thematic analysis, which involved looking for studies, recording and presenting findings in figures, and extracting data summary tables that are shown in the study's "findings/results" section.

FINDINGS

In the comprehensive literature search across two primary databases—PubMed and Google Scholar—as well as additional sources, 73 articles were initially identified. Upon further scrutiny, 72 full-text articles underwent eligibility screening, out of which 67 were excluded for various methodological or contextual reasons. Consequently, only five studies met the

inclusion criteria and were incorporated into the final review. The process of data synthesis was guided by two principal objectives: first, to evaluate the primary medical determinants contributing to maternal mortality in Ethiopia, and second, to examine the socio-economic, cultural, and systemic variables exacerbating this public health issue. Subsequent sub-sections will present findings on risk factors for maternal mortality in Ethiopia, as derived from the five selected studies.

Maternal Mortality Rates

The findings from the five chosen studies provide a thorough insight of the level of maternal mortality in Ethiopia's various geographical regions. In order to highlight the dire state of maternal health in southwest Ethiopia, Legese, Abdulahi, and Dirar (2016) reported 120 maternal deaths at Jimma University Specialized Hospital over a five-year period, with no comparable live births documented. 44 deaths per 1,000 surgical deliveries or complications were reported by Buluy and Reddy (2014), who also recorded a maternal death frequency of 4.4% in the Ambo Hospital in the Oromia region. This indicates a concerning number of maternal surgical intervention deaths. Maternal Mortality Ratio (MMR) of 228.3 per 100,000 live births was recorded by Shiferaw et al. (2021) in their study at Saint Paul's Hospital Millennium Medical College in Addis Abeba, which included records of 40 maternal deaths among 17,522 live births. Even while this number is lower than in other areas, it is nonetheless alarming. 13 maternal fatalities were noted over a three-month period in Bench Maji Zone in research by Weyesa et al. (2015), but no comparable live births were documented. This suggests that there may be underreporting of maternal deaths or a lack of comprehensive maternal health services. The shocking 4,316 maternal deaths from 2013 to 2020 were examined by Tesfay et al. (2023) utilizing secondary data from the Ethiopian Public Health Institute. This body of information emphasizes how urgently needed focused interventions are.

Primary Risk Factors for Maternal Mortality in Ethiopia

The analysis of the main risk factors for maternal mortality in five separate research reveals a complicated yet interconnected landscape of risk factors in Ethiopia. According to Legese, Abdulahi, and Dirar (2016), sepsis and post-partum hemorrhage (PPH) each caused 30.8% of maternal deaths, with anemia coming in second at 28% and uterine rupture coming in at 23.3%. The prevalence of PPH and sepsis as important risk factors is consistent with the results of Shiferaw et al. (2021), who indicated that hypertensive disorders of pregnancy (HDP) were the major cause of maternal mortality, accounting for 32.5% of all cases, followed by PPH at 25% and sepsis at 10%.

Contrarily, Buluy and Reddy (2014) highlighted obstructed labor as the most common complication, even though PPH and uterine rupture were the primary causes of maternal death. In addition to highlighting obstructed labor (23.1%), Weyesa et al. (2015) discovered sepsis (15.4%) to be a significant contributing factor, with PPH and HDP each accounting for 7.7% of maternal deaths. PPH was specifically identified as the major risk factor by Tesfay et al. (2023), accounting for nearly half (48.9%) of all maternal fatalities, followed by HDP at 17.2% and sepsis at 8.8%.

Secondary Risk Factors (Systemic, Socioeconomic, and Cultural Elements) for Maternal Mortality in Ethiopia.

Maternal mortality in Ethiopia is a complex issue, and secondary risk variables, such as structural, socioeconomic, and cultural factors, shed light on it. According to Legese, Abdulahi, and Dirar (2016), more than half (52.5%) of maternal deaths involved women between the ages of 20 and 34 who were primarily from rural regions (75.83%). This is consistent with the age distribution (72.5%) described by Shiferaw et al. (2021), who also noted severe delays in the healthcare system. 67.5% of patients had delays inside the medical facility, and 70% of referrals came from facilities outside of Addis Abeba. Tesfay et al. (2023) highlighted the negative effects of rural living, noting that 85.1% of deceased women were from such regions. The socio-economic gap was again highlighted by the fact that 81.2% of respondents were illiterate. Maternal mortality was found to be significantly correlated with characteristics like occupation, ethnicity, age, and religion by Weyesa et al. (2015), but not with marital or educational status. Their findings contrast with those of Tesfay et al. (2023), who found that most of the deceased women lacked literacy, implicating educational attainment as a significant determinant. Poor antenatal care (ANC) attendance was reported by Buluy and Reddy (2014), however they did not provide detailed information on any other secondary risk factors.

Despite varying results between research, parity and gravidity typically indicated high-risk groups. For example, Shiferaw et al. (2021) found that 42.5% of the population was primigravida, while Legese, Abdulahi, and Dirar (2016) found that 43.3% were primiparas. Women with 2-4 parities (39.6% of deaths) were more prevalent, according to Tesfay et al. (2023). With no ANC in 67.5% of cases in Legese, Abdulahi, and Dirar (2016) and 67.9% of cases in Tesfay et al. (2023), the ANC follow-up was noticeably inadequate in the other studies.

Table 2: Data Summary Table

Author/Year	Study Title	Aim	Study Design	Methods	Main Findings	Critical Appraisal
Legese, T., Abdulahi, M., & Dirar, A. (2016)	Risk Factors of Maternal Death in Jimma University Specialized Hospital: A Matched Case Control Study	To assess risk factors of maternal mortality in JUSH, Ethiopia from January 2010 to December 2014.	Case-Control Study	A total of 600 charts, 120 cases and 480 Controls. Sample size was determined by two population proportion using Epi info version 7. A retrospective analysis.	120 maternal deaths from 2010 to 2014 at Jimma University Specialized Hospital. Leading causes: post-partum hemorrhage, sepsis, anemia, uterine rupture. Major risk factors: rural residence, lack of ANC follow-up, and post-partum deaths.	Appropriate design. Valid findings.

Buly, B. Reddy, O.C.S. (2014)	Analysis of Risk factors for Maternal Death and Delivery Complications' in West Shoa Zone, Oromia Region, Ethiopia: A Retrospective Study	to assess determinants of pregnancy complication related maternal death in a rural setting in the region of Oromia, West Shoa Zone, Ambo Hospital for the year 2006	A retrospective descriptive study	227 delivery complications have been reviewed from the hospital obstetric record. The descriptive analysis, estimation and tests of association were performed using SPSS statistical program.	Maternal death prevalence: 4.4% (44 deaths per 1000 operative deliveries or complications). Primary risk factors: Obstructed labor, uterine rupture, mal-presentation, and antepartum hemorrhage. Secondary risk factors: Low ANC attendance, maternal status significantly associated with risk factors.	Appropriate design. Valid findings.
Shiferaw, M. et al (2021)	Maternal Death Review at a Tertiary Hospital in Ethiopia	Systematically analyze the maternal deaths at SPHMMC to determine the magnitude, causes and contributing factors for maternal mortality at the institution.	A prospective cross-sectional study was conducted from January 2016 to December 2017	Data were collected from 1 January 2016 to 31 December 2017. 40 maternal deaths that occurred during the study period were included in the study. A prospective study.	Maternal Mortality Ratio: 228.3 per 100,000 live births. Primary Risk Factors: Hypertensive disorders, postpartum hemorrhage, sepsis. Secondary Factors: Mainly Age (20-34) delays in care, high referral rates, no antenatal visits. More postpartum deaths.	Appropriate design. Valid findings.
Weyesa, J. et al.	Prevalence and Risk	Determination of the	A retrospective	Total sample of mater death	Three-month study.	Appropriate design.

(2015)	Factors Associated with Maternal Mortality in Mizan-Aman Hospital, Bench Maji, Southwest Ethiopia	Prevalence and risk factors associated with maternal mortality in Referral Hospital.	tive descriptive study	cases used is 13. The data collection for the preceding 3 months by using standard collection format. statistically analyzed by using STATA 12 and SPSS 20	13 (3.39%) maternal deaths. Primary risk factors: Obstructed labor, sepsis, postpartum hemorrhage, hypertensive disorders. Maternal deaths related to age, parity, occupation, ethnicity, and religion.	Valid findings.
Tesfay, N. et al. (2023)	Place of death and associated factors among reviewed maternal deaths in Ethiopia: a generalized structural equation modelling	to assess the magnitude of maternal death in different settings. examine the association of several factors.	Qualitative study. (Healthcare setting mainly incorporated)	Total sample size of 4316. A retrospective historical data analysis approach using the generalized structural equation modelling (GSEM).	4316 maternal deaths reviewed from 2013-2020. Primary risk factors: Mainly PPH, HDP and sepsis. Secondary factors: Mainly illiteracy, mean age 28.7, rural residence, no ANC follow-up. More postpartum deaths.	Appropriate design. Valid findings.

DISCUSSION

Summary of Findings and Discussions

Maternal Mortality in Ethiopia

According to the papers under consideration, maternal mortality is alarmingly common in various parts of Ethiopia. 120 maternal fatalities occurred between 2010 and 2014 at Jimma University Specialized Hospital, but no associated live births were noted, according to Legese, Abdulahi & Dirar (2016). In the Oromia region, 4.4% of 1,000 surgical deliveries resulted in

maternal fatalities, according to a report by Bully and Reddy (2014). In Addis Abeba, Shiferaw et al. (2021) reported an MMR of 228.3 per 100,000 live births, based on 40 maternal deaths and 17,522 live births. In a three-month period, Weyesa et al. (2015) recorded 13 maternal deaths without any accompanying live births. Tesfay et al. (2023), using information from the Ethiopian Public Health Institute, reported a total of 4,316 maternal fatalities between 2013 and 2020.

The reports from these studies show maternal mortality rates with dramatic differences. For instance, the MMR in Addis Ababa (Shiferaw et al., 2021) is lower than the national average for Ethiopia, which is thought to be 267 per 100,000 live births as of 2020 (World Bank Group, 2023). According to a larger body of literature, systemic healthcare inequities are frequently to blame for these geographical differences (Alkema et al., 2016). Particularly concerning is the high prevalence rate of 4.4% found by Bully and Reddy (2014). This type of high maternal death rate has been linked to socioeconomic difficulties, restricted educational possibilities, and low access to healthcare (Kassebaum et al., 2016; Filippi et al., 2016).

The calculation of MMRs, which is necessary for comparative analysis (Say et al., 2014), is made more difficult by the lack of live birth data in the research by Legese, Abdulahi, and Dirar (2016), Weyesa et al. (2015), and Tesfay et al. (2023). However, the sheer number of fatalities, particularly the 4,316 recorded by Tesfay et al. (2023), underscores a dangerous situation requiring prompt action.

Primary Risk Factors for Maternal Mortality in Ethiopia

According to the studies, there are numerous major risk factors for maternal death in Ethiopia. Post-partum hemorrhage (PPH) and sepsis are the primary causes, followed by anemia and uterine rupture, according to Legese, Abdulahi, and Dirar (2016). Uterine rupture and obstructed labor are highlighted by Bully and Reddy (2014). Hypertensive disorders of pregnancy (HDP) and PPH are highlighted by Shiferaw et al. (2021). While Tesfay et al. (2023) place a stronger emphasis on PPH followed by HDP, Weyesa et al. (2015) also include obstructed labor and sepsis.

These findings on the main risk factors follow general global trends but show distinct regional patterns throughout Ethiopia. As a global leading cause (Say et al., 2014; WHO, 2019), PPH is repeatedly highlighted as a main cause of maternal mortality (Legese, Abdulahi, and Dirar, 2016; Shiferaw et al., 2021; Tesfay et al., 2023). Intriguingly, sepsis is a significant concern in Ethiopia (Legese, Abdulahi, and Dirar, 2016; Weyesa et al., 2015), in contrast to a lesser emphasis elsewhere, indicating a potential area-specific problem requiring targeted therapies (Kassebaum et al., 2014).

Another critical issue is obstructed labor (Bully & Reddy, 2014; Weyesa et al., 2015), which has been associated with a lack of access to expert delivery attendance (Sitaula et al., 2021). Shiferaw et al. (2021), in an important contribution, identify less frequent but significant causes including pulmonary thromboembolism (PTE) and amniotic fluid embolism (AFE). Despite

frequently being underrated, these diseases play a significant role in maternal deaths (Khan et al., 2006).

The prominence of hypertensive disorders in multiple studies (Shiferaw et al., 2021; Tesfay et al., 2023) is concerning. HDP is often manageable with early detection and proper care (Duley, 2009), pointing towards deficiencies in prenatal care.

Secondary Risk Factors (Systemic, Socioeconomic, and Cultural Elements) for Maternal Mortality in Ethiopia

Age, place, and distance from healthcare facilities were revealed to be significant determinants, along with antenatal care (ANC) attendance rates by Legese, Abdulahi, and Dirar (2016). Shiferaw et al. (2021) identified delayed medical care as a fundamental problem that was exacerbated by a patient's age and referral sources. According to Weyesa et al. (2015), maternal mortality was related to occupation, ethnicity, and religion. Tesfay et al. (2023) highlighted lack of ANC visit, rurality, and educational status as major risk factors. Only the poor ANC attendance was reported by Buluy and Reddy (2014).

Most of the selected studies have found that women between the ages of 20 and 34 are more sensitive to maternal mortality (Legese, Abdulahi, and Dirar, 2016; Shiferaw et al., 2021; Tesfay et al., 2023). This is consistent with research from throughout the world that indicates this age group has the highest rates of maternal death (Ganchimeg et al., 2014).

Location and accessibility to healthcare are common issues. Rural areas accounted for more than 75% of cases in the study by Legese, Abdulahi, and Dirar (2016) and 85.1% by Tesfay et al. (2023). This is consistent with studies showing that living in rural areas is linked to higher rates of maternal mortality because of limited access to healthcare services (Montgomery et al., 2014; World Health Organization, 2019).

Delay in care is a serious problem. According to the Shiferaw et al. (2021) three-delay model, delays within healthcare facilities were present in the majority of instances (67.5%). This raises the possibility of systemic flaws in the healthcare system and supports the findings from Gabrysch et al. (2011) that systemic delays have a major impact on maternal mortality.

The ANC attendance varied widely between research. Shiferaw et al. (2021) reported that 85% of the cases had at least one ANC visit, however Legese, Abdulahi, and Dirar (2016) and Tesfay et al. (2023) discovered that most cases had no ANC visits. It has long been recognized that ANC is essential for reducing maternal mortality (Carroli et al., 2001).

The Tesfay et al. (2023) study, in which 81.2% of deceased women were illiterate, also emphasizes the need for education. This is consistent with broader research showing that results for maternal health are highly influenced by education (Meh et al., 2019).

Strengths and Limitations of the Review

The systematic review, which is based on a variety of research settings and methodologies, provides a thorough understanding of maternal death rates and risk factors in Ethiopia. The review's inclusion of studies from many Ethiopian regions and time periods, which improves the generalizability of its conclusions, is one of its strengths. The review also carefully considers secondary systemic, socioeconomic, and cultural risk factors like distance from healthcare and antenatal care visits (Gabrysch et al., 2011; Meh et al., 2019) as well as primary medical risk factors like post-partum hemorrhage and hypertensive disorders (Ganchimeg et al., 2014; WHO, 2019). With its many facets, this strategy offers a comprehensive view of maternal health in Ethiopia.

However, there are some limitations that must be taken into consideration. First, the studies heavily rely on hospital data, which may not be representative of maternal health and risk factors in rural areas or among women who do not have access to hospital care (Montgomery et al., 2014). Second, there are differences in the quality of data across studies. Some provide in-depth analysis regarding risk factors, while others offer scant information, especially on secondary risk factors like education.

Implications

This systematic review of maternal mortality rates and associated risk factors in Ethiopia highlights several crucial consequences for public health policies, global health, and the 2030 attainment of SDG 3.

Maternal Mortality in Ethiopia and Its Effects on Global Health: Ethiopia's high maternal death rate and related risk factors have wider effects on global health. Maternal mortality, which reflects differences in healthcare access and quality, is a crucial indicator of a country's overall health system performance. As one of the most populous nations in Africa, Ethiopia has a substantial impact on regional and international statistics with regards to maternal health (World Health Organization, 2020). Global progress toward SDG 3 is hampered by high maternal mortality rates (World Health Organization, 2023a). To meet SDG 3's goal of lowering the maternal death rate, the entire world community must work together to solve this problem (United Nations, 2015).

Obstacles to SDG 3 Implementation in Ethiopia: This assessment highlights significant obstacles to Ethiopia's progress toward achieving SDG 3, particularly those pertaining to maternal mortality (Ayele et al. 2022)). Geographical disparities, socioeconomic considerations, and cultural norms that influence women's healthcare-seeking habits are challenges (Central Statistical Agency Ethiopia & ICF, 2016). There is also inadequate access to high-quality maternal healthcare services. The accomplishment of SDG 3, especially target 3.1, depends on addressing these complex concerns (UNICEF, 2019).

The interconnectedness of SDG 3 with other SDGs is highlighted by this comprehensive review. Reduced maternal mortality is closely related to the SDGs that target access to safe drinking water and sanitation (SDG 6), gender equality (SDG 5), quality education (SDG 4),

and poverty reduction (SDG 1) (United Nations, 2015a). Maternal health advancements are crucial to achieving several sustainable development goals and are a pillar of more general global health objectives (World Health Organization, 2020a).

Role of Globalization: According to Ramzan et al. (2023), globalization has a significant impact on SDG achievement and public health practices. In order to reduce maternal mortality in Ethiopia, international collaborations, finance, and information sharing are crucial (UNFPA, 2023). In the context of reaching SDG 3, globalization makes it easier to disseminate best practices and cutting-edge healthcare solutions to improve maternal health outcomes (Ramzan et al. 2023; World Health Organization, 2020).

Recommendations

Ethiopia needs to take a diversified approach based on evidence-based tactics and international collaboration to address the challenges preventing it from making progress toward attaining SDG 3 by 2030, that focuses on maternal mortality.

Increase access to maternal healthcare, strengthen the healthcare system, particularly in rural areas, and work with global health organizations like WHO and UNFPA (Ayele et al., 2022; UNFPA, 2023; World Health Organization, 2020a).

Maternal mortality can be reduced also by encouraging competent birth attendance through community health workers and midwives, especially in marginalized areas (UNFPA, 2023).

Financial Assistance and Health Insurance: According to UNICEF (2019) and UNFPA (2023), expanding health insurance coverage and offering financial assistance to low-income families can lower the cost of maternity care.

Community Engagement and Education: Community-based family planning, prenatal care, and maternal health awareness programs, along with education, give women the power to make wise health decisions (UNICEF, 2019; WHO, 2020a; UNFPA, 2023).

Cultural Sensitivity: It is crucial to adopt culturally sensitive strategies that respect local customs and beliefs (WHO, 2020a). Cultural differences can be overcome, and healthcare-seeking habits can be improved through collaborative relationships between healthcare providers and communities (WHO, 2020a).

Data-Driven Decision-Making: It is important to regularly gather and analyze data in order to track success and pinpoint areas that could use improvement (UNICEF, 2019). Data collection and reporting methods can be improved by implementing digital health solutions (World Health Organization, 2020a).

International Collaboration: Ethiopia should keep working with governments, Non-Governmental Organizations (NGOs), and international organizations to make the most of their resources, knowledge, and best practices (UNFPA, 2020; WHO, 2020). Such alliances can help with resource mobilization and knowledge exchange.

Research and Innovation: Invest in region-specific research to address maternal mortality challenges and leverage healthcare innovations, including telemedicine, for improved access (Ayele et al., 2022; Ramzan, M. et al. 2023). Political Commitment: Ensure continuous political dedication to prioritize maternal health nationally, aligning advocacy and policies with SDG 3 and broader sustainable development goals (UNFPA, 2020; UNICEF, 2019).

CONCLUSION

With a high rate of maternal death and a complicated web of risk factors, this systematic review highlights the serious maternal health issues that Ethiopia is currently confronting. A multifaceted strategy is required to achieve SDG 3 by 2030, particularly in lowering maternal mortality. Key findings highlight the necessity of bolstering healthcare infrastructure, encouraging skilled birth attendance, and increasing health insurance coverage. The need for data-driven decision-making, cultural awareness, and community involvement cannot be overstated. The accomplishments of Ethiopia in maternal health are closely related to their effects on global health, demonstrating the interdependence of SDGs. Collaboration with global health groups and ongoing political support are essential. By addressing these complex issues, Ethiopia can greatly improve maternal health and get us closer to the 2030 target of universal health care and good health for all.

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