



Effective Coverage of Emergency Obstetric and Newborn Care Services in Africa: A Scoping Review

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Objective: This scoping review aimed to map the evidence of effective coverage (EC) of EmONC (Emergency Obstetric and Neonatal Care) services and associated factors in Africa.

Methodology: The review used PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews) checklist to select, appraise, and report the findings. We searched four databases (PubMed, Web of Science, Google Scholar, and Scopus) and grey literature published between Jan 01, 2011 – Dec 31, 2020. The search terms included “emergency”, “obstetric”, “newborn”, “effective coverage”, and “quality” with Boolean terms, AND and OR. The review was conducted using title, abstract, and full-article screenings. The results were analyzed thematically using NVivo v12 qualitative research data analysis software.

Results: Of the 1811 searched studies, 32 met the eligibility criteria for review. The majority of the studies were from East (56.3%) and Western (28.1%) Africa. Most studies were cross-sectional, had targeted health facilities, and combined two or more data collection techniques. The thematic analysis yielded three themes: EmONC service utilization, quality of EmONC service, and factors associated with the quality of EmONC services. The review showed a scarcity of evidence and variations regarding the crude coverage, quality of care, and factors affecting the quality of EmONC services in Africa.

Conclusion: The review reported that the utilization of EmONC services was below the WHO-recommended 100% in all studies, though some reported improvements over time. Disparities in EmONC services quality were paramount across studies and contexts. However, the methodological and analytical incongruity across studies brought difficulties in tracing and comparing the progress made in EmONC services utilizations.

Registration: This scoping review protocol was first registered on the Open Science Framework (OSF) on Aug 27, 2021 (<https://osf.io/khcte/>).

Keywords: maternal health, newborn health, obstetric care, perinatal care, emergency medicine

Introduction

Pregnancy is mothers' riskiest experience while bringing new life to this world. It usually accompanies life-threatening complications such as severe bleeding, infection, unsafe abortion, hypertensive disorders, and delivery complications leading to death and disabilities.¹ According to the 2019 WHO report, more than 810 mothers die daily during pregnancy or childbirth, causing 295,000 maternal deaths.² Evidence shows that 94% of the estimated maternal deaths occurred in low-income countries.² Compared to the developed world, the maternal mortality ratio was 40 times higher in the least developed countries.¹ For instance, in Sub-Saharan Africa, there were 542 maternal deaths/100,000 live births, while there were only 7–10 maternal deaths/100,000 live births in Australia and Europe.¹

Emergency obstetric and neonatal care (EmONC) is a package of care for mothers and neonates when severe life-threatening complications occur during pregnancy, child delivery, and postpartum. EmONC is believed to avert three-fourths of maternal mortality.³ Nevertheless, the effectiveness of EmONC depends on the health facilities' readiness to provide care, quality of care, and the functionality, timeliness, and organization of referral systems in a given setting.^{4,5}

In low-income countries, health systems have minimal resources and capacities, and women needing EmONC services often face challenges in accessing and utilizing them.⁵ Lack of evidence on the EC of EmONC services and factors affecting the utilization of quality service hinders the delivery of contextual solutions to maternal and child health problems in Africa.⁶

Several indicators have been defined to monitor maternal and child health.⁷ The third goal of the Sustainable Development Goals (SDGs) focuses on good health and well-being. The goal aims to improve maternal and child health by tracking the progress using indicators such as reducing global maternal mortality to less than 70/100,000 live births and neonatal mortality below 12/1000 live births. It also focuses on achieving universal health coverage and access to quality service by 2030.⁷ Recent studies of health systems have led to a proliferation of research that gives attention beyond access to the actual quality of care, highlighting the need for EC (a fraction of potential health gain delivered to the population in need). This concept combines the three widely used EC components: need, coverage/utilization, and quality of healthcare interventions.^{8–12} Though there are other ways to measure EC for health services, evidence suggests that quality-adjusted coverage is preferable to measuring maternal and child health services' EC. It is believed to provide an overall impression of EC in global, regional, national, and local settings.¹²

The evidence stated EC as a fraction of potential health gain delivered through a health intervention by the health system, which is measured through the three components: need, use, and quality of healthcare service. The need is the population that needs a given health intervention (EmONC services). At the same time, use is the utilization of the intervention (EmONC services) among the people in need.¹³ The Donabedian framework of quality assessment remains the foundation of quality assessment today. The framework assesses service quality using the triads, namely, structure, process, and outcome of health care. "Structure" is defined as the setting, qualification of providers, and administrative system through which care (EmONC) is provided. "Process" is defined as the components of care (EmONC) delivered, while "outcome" is recovery, restoration of function, and survival (after EmONC services are provided).^{11,14}

A scoping review was selected as the method of choice to study the EC of EmONC services and the factors affecting service quality. It is an appropriate method to map the evidence available in Africa, and no such study has been conducted to the authors' knowledge. It helps to understand the existing knowledge gap in a broader context.¹⁵ Improving EC of EmONC services is among the major global priority health agenda.^{7,16} Hence, this review aimed to map evidence on EC of EmONC services and factors associated with quality service utilization in Africa. Therefore, this review will help policymakers, researchers, and stakeholders undertake evidence-based decisions on EmONC services to improve Africa's maternal and neonatal health and well-being.

Methodology

This scoping review followed Arksey and O'Malley's proposed scoping review framework. The framework consists of six steps: (a) identifying the research question and eligibility criteria, (b) identifying relevant studies, (c) selecting the studies and appraising the quality, (d) charting the data, (e) collating, summarizing, and reporting the results, and (f) consultation.¹⁷

Identifying the Research Question

This scoping review had the following research questions:

- What is the level of EC of EmONC services in Africa?
- What is the level of quality of EmONC services in Africa?
- What are health facility-related factors associated with the utilization of quality EmONC services in Africa?
- What are maternal behavioral factors related to using quality EmONC services in Africa?
- What sociodemographic factors are associated with utilizing quality EmONC services in Africa?

Eligibility of the Research Question

This study involved the core elements of the Population, Concept, and Context (PCC) suggested by the 2015 Joanna Briggs Institute methodology for scoping review guideline to determine the eligibility of the research question.¹⁸ (Table 1)

Identifying Relevant Studies

This review comprehensively identified relevant studies by searching published and unpublished (grey) literature databases. The investigators used PubMed, Web of Science, Google Scholar, and Scopus to search for published evidence. The WHO, Demographic and Health Survey (DHS) report, and other international organizations' websites were searched for relevant grey literature. We used the following key terms in combination and appropriate Medical Subject Heading (MeSH) terms to search for relevant studies from the electronic databases: "Emergency Service", "Emergency Medical Services", "Emergenc*", "Obstetric*", "Labor Complication*", "Pregnancy Complication*", "Obstetric care service*", "obstetric service*", "Neonatal Nursing", "Neonatal service*", "Neonatal care", "Newborn", "Effective coverage", "Quality of Health Care", "quality service*", "quality-adjusted delivery care", "Risk Factors", "Factors associated", and "Africa". (Table 2)

We used the Boolean terms 'AND' and 'OR' to separate keywords. We also used truncation and field codes/tags of title, MeSH terms, and text words/keywords for filtering. We limited the selection of studies based on their publication date. Accordingly, studies published in Africa from Jan 01, 2011, to Dec 31, 2020, were considered for review. The investigators also searched the reference list of all identified grey literature and published articles for additional studies. The authors have tried contacting the authors of the identified studies for further information and support.

Selecting the Studies and Appraising the Quality Eligibility Criteria

This review included studies that fulfilled the following inclusion criteria:

- Studies presenting evidence of EC of Emergency Obstetric and Neonatal Care (EmONC) services
- Studies showing evidence of the quality of EmONC services
- Studies conducted in African countries
- Studies published in the English language
- Studies published on or after Jan 01, 2011 (Jan 01, 2011 – Dec 31, 2020)
- Studies published in peer-reviewed journals or grey literature with extractable primary research data with qualitative research, randomized controlled trials, non-randomized studies, quantitative descriptive studies, and mixed methods studies.

This review was conducted using the three stages. In the first stage, the principal investigator did a title screening, removed the duplicates, and exported the studies to Endnote 20. Two independent reviewers used the eligibility criteria in the second and third stages to do abstract and full-article screenings. When the studies were not accessible, investigators attempted to contact the authors and the University of KwaZulu-Natal library service. The third reviewer's decision was accepted to resolve any disagreement at the abstract screening stage. The investigators described the screening using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline.¹⁹ (Figure 1)

Table 1 The PCC Framework of JBI Methodology for Scoping Review for Defining the Eligibility of the Research Question

Item	Description
Population	<ul style="list-style-type: none"> • Women aged 18 years and above who need Emergency Obstetric and Neonatal Care (EmONC) services • Health facilities that provide EmONC services
Concept	<ul style="list-style-type: none"> • EC of EmONC services, measured as per its three components: <ul style="list-style-type: none"> • Need, • Coverage/utilization, and • Service quality
Context	Africa

Table 2 Data Charting (Studies Included in the Scoping Review)

Author	Publication Year	Country	Aim	Study Design/ Setting	Target Group	Sample Size	Data collection Method
Mpunga Mukendi D et al ²²	2019	DRC	Assessing the availability, quality, and equity of EmOC	Cross-sectional	Health facilities	1555	Interview, observation, and record review
Berhane B et al ²³	2019	Ethiopia	Describing the quality of BEmONC and associated factors	Cross-sectional	Women	398	Interview
Pearl Thwala SB et al ²⁴	2018	South Africa	Assessing the facilities' preparedness to provide EmONC	Cross-sectional	Health facilities	15	Record review, interview, and observation
Augusto O et al ²⁵	2018	Mozambique	To investigate changes in the availability, use, and quality of EmONC	Secondary data analysis	Health facilities	1324	Record review and interview
Ntambue AM et al ²⁶	2017	DRC	Assessing the availability, utilization, and quality of EmONC	Cross-sectional	Health facilities	53	Interview, observation, and record review
Ouédraogo AM et al ²⁷	2016	Togo	Assessing the availability, use, and quality of EmONC	Cross-sectional	Health facilities	1019	Record review
Kumsa A et al ²⁸	2016	Ethiopia	To assess satisfaction with EmONC services	Cross-sectional	Women	403	Interview
Kouanda S et al ²⁹	2016	Burkina Faso	Analyzing and comparing the availability, use, and quality of services for maternal and neonatal health	Cross-sectional	Health facilities	812	Record review
Kosgei RJ et al ³⁰	2016	Kenya	To determine the level of quality of CEmONC	Cross-sectional	Women	1216	Observation and record review
Abegunde D et al ³¹	2015	Nigeria	To report the availability, utilization, and quality of EmONC	Cross-sectional	Health facilities	59	Record review and interview
Admasu K et al ³²	2011	Ethiopia	Reporting the availability and quality of EmONC	Cross-sectional	Health facilities	806	Record review and interview
Maswanya E et al ³³	2018	Tanzania	To establish the provision of EmONC signal functions and reasons for the failure	Cross-sectional	Health facilities	261	Observation and interview
Solnes Miltenburg A et al ³⁴	2017	Tanzania	To perform a district-wide assessment of EmONC performance and identify ways for improvement	Cross-sectional	Health facilities	18	Observation, interview, and record review

(Continued)

Table 2 (Continued).

Author	Publication Year	Country	Aim	Study Design/ Setting	Target Group	Sample Size	Data collection Method
Gov Sierra Leone et al ³⁵	2017	Sierra Leone	To generate evidence on the availability, utilization, and quality of EmONC and routine delivery services	Cross-sectional	Health facilities, women, and care providers	181	Interview, record review, and observation
EPHI et al ³⁶	2017	Ethiopia	To generate evidence on the availability, utilization, and quality of EmONC and routine delivery services	Cross-sectional	Health facilities, women, and care providers	3804	Interview, record review, and observation
Malawi MOH et al ³⁷	2015	Malawi	Measuring the EmONC services' adequacy	Cross-sectional	Health facilities, women, and care providers	365	Interview, record review, and observation
Gambia MOH et al ³⁸	2012	Gambia	To generate information that would be used to strengthen health systems to reduce maternal and child mortality	Cross-sectional	Health facilities, women, and care providers	98	Interview, record review, and observation
Ghana MOH et al ³⁹	2011	Ghana	To generate information that would be used to strengthen health systems to reduce maternal and child mortality	Cross-sectional	Health facilities, women, and care providers	1268	Interview, record review, and observation
Hirai M et al ⁴⁰	2020	Kenya	To explore pregnant mothers' experiences with ANC visits and delivery	Qualitative	Women and care providers	144	FGD
Geleto A et al ⁴¹	2020	Ethiopia	To investigate the perceptions of midwives about the quality of EmOC	Qualitative (explanatory)	Midwives	12	IDI
Banke-Thomas A et al ⁴²	2019	Kenya	Exploring stakeholders' perceptions of EmONC training	Qualitative	Women and care providers	219	KII, FGD
Okonofua F et al ⁴³	2017	Nigeria	To determine the nature of institutional policies and frameworks for managing obstetric complications and reducing maternal deaths	Qualitative	Managers and care providers	36	IDI, KII
Stal KB et al ⁴⁴	2015	Tanzania	Assessing women's perception of the quality of obstetric care	Qualitative (exploratory)	Women	22	IDI, observation
Chi PC et al ⁴⁵	2015	Burundi and Uganda	To explore the barriers to the effective delivery of EmONC	Qualitative (case study)	Care providers	69	IDI, FGD

(Continued)

Table 2 (Continued).

Author	Publication Year	Country	Aim	Study Design/ Setting	Target Group	Sample Size	Data collection Method
Afari H et al ⁴⁶	2014	Ghana	To understand the healthcare workers' perspectives on causes of challenges in the referral of obstetric causes	Qualitative (Narrative)	Care providers	18	IDI
Kabo I et al ⁴⁷	2019	Nigeria	To evaluate the impact of quality improvement interventions	Prospective before and after study	Health facilities	59	Record review and interview
Spitzer RF et al ⁴⁸	2014	Kenya	To determine the impact of introducing the EmONC training program on maternal and perinatal morbidity and mortality	Prospective chart review	Women	3553	Record review
Kadia R.S et al ⁴⁹	2020	Cameroon	Evaluating EmONC services' coverage, functionality, and quality	Retrospective	Health facilities	31	Interview and observation
Girma M et al ⁵⁰	2013	Ethiopia	To assess the availability, quality, and utilization of EmOC	Retrospective	Health facilities	66	Record review
Austin A et al ⁵¹	2015	Ethiopia	To assess barriers to the provision of quality EmONC	Mixed method	Care providers	140	IDI, KII
Mirkuzie AH et al ⁵²	2014	Ethiopia	Examining the progress of BEmONC services' implementation	Interventional	Care providers and health facilities	98	Record review and observation
Nada KH et al ⁵³	2011	Egypt	To assess the quality of care for obstetric emergencies	Quantitative (observational)	Women	102	Interview, observation of care provision

Quality Appraisal

The selected studies' quality was assessed using the Mixed Methods Appraisal Tool (MMAT) 2018 version.²⁰ This tool helped the investigators evaluate the quality of different study designs in terms of appropriateness of the study's aim, methods, study design, study participant selection, data collection, analysis, discussion, and conclusion.

Charting the Data

A customized data charting table was developed and used for the review (Table 2) and piloted by two independent investigators using a random sample of 10 included studies for consistency. It was used to extract information from the included data sources/documents. The table was modified as required based on the investigators' feedback and was updated continuously throughout the review. After data extraction, the comparison was made, and any disagreement was resolved through discussion. The third investigator was consulted in cases of disputes to reach a consensus. The review used NVivo version 12 software (QSR International Pty Ltd, Burlington, MA, USA) to classify, sort, arrange, examine, and extract the relevant outcomes through thematic analysis.

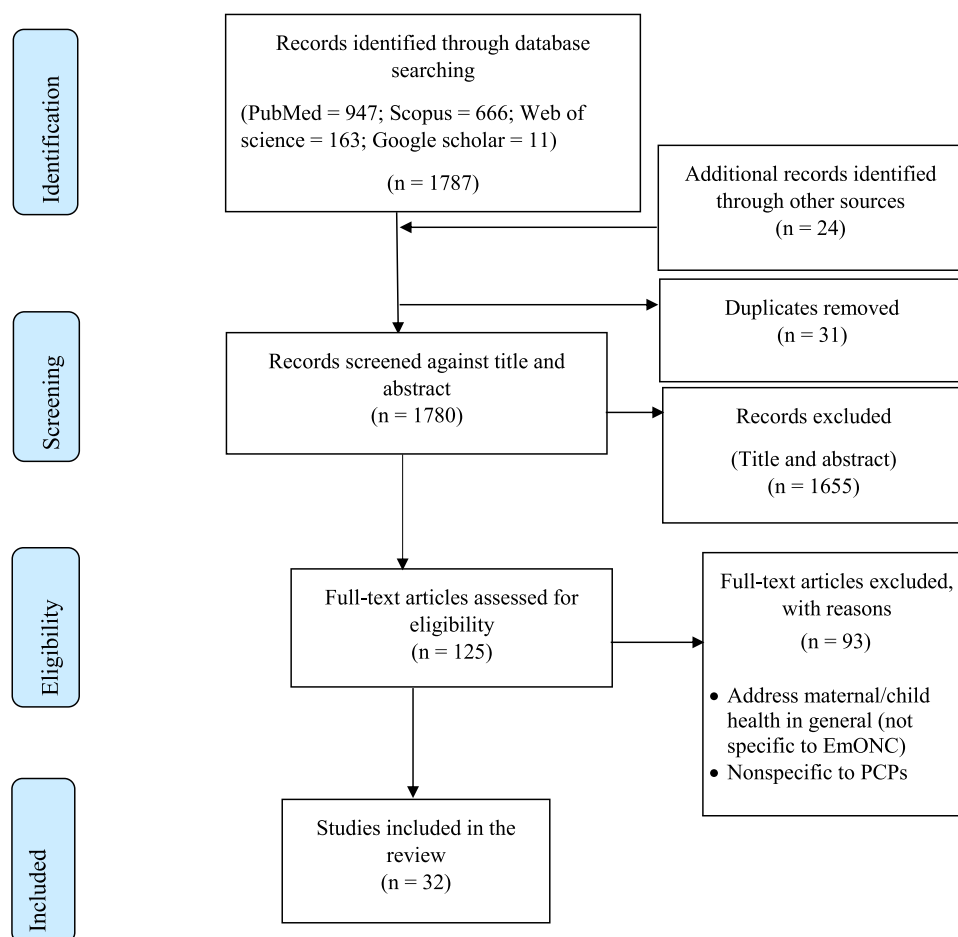


Figure 1 PRISMA 2009 Flow Diagram for selection of studies.

Note: Adapted from Moher D, Liberati A, Tetzlaff J, Altman DG; The, Prisma Group. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: the PRISMA Statement. *PLoS Med.* 2009;6(7):e1000097. doi:10.1371/journal.pmed.1000097.¹⁹

Collating, Summarizing, and Reporting the Results

This scoping review used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Extension for Scoping Reviews (PRISMA-ScR) checklist ([Supplementary File](#)).²¹ The review presented a numerical summary description at each stage of the PRISMA flow diagram. The charting and appraisal tools' findings were summarized and presented in tabular form using the respective tools' categories.

The investigators presented a summarized diagrammatic presentation of eligible articles' major characteristics, such as the study's characteristics, including geographic location, design, data collection techniques, and target populations. The relevancy of data for the research question on factors affecting the quality of EmONC services was presented for each evidence source and sorted by the data's perspective. The investigators have also undergone thematic analysis to summarize the results based on themes from the extracted data.

Consultation

Investigators consulted the key stakeholder groups (health system leaders/decision-makers, healthcare providers, and service users). Investigators also consulted non-governmental organizations involved in the EmONC services delivery and obtained relevant inputs on the literature gap and understanding for the review.

Result

The database search yielded 1787 studies, and the grey literature search yielded 24 studies, of which 31 duplicates were removed. Next, 1655 studies were removed during the title and abstract screening because they did not meet the inclusion criteria, and 93 were removed during the entire article screening stage (as they were either not specific to EmONC or PCPs). Finally, 32 studies were included in the study. The steps used to select studies for the review are provided in the PRISMA flow diagram (Figure 1).

Characteristics of Included Studies

The Studies' Location and Types

Most studies were from East and Western African countries (Figure 2). A variety of studies were included in the review, including 18 cross-sectional studies,^{22–39} seven qualitative studies,^{40–46} one prospective before-after study,⁴⁷ one forthcoming chart review study,⁴⁸ two retrospective studies,^{49,50} one mixed method study,⁵¹ one interventional study,⁵² and one observational study.⁵³

The Studies' Focus

Most included studies targeted health facilities and a combination of at least two target populations (representing a combination of health facilities, women, care providers, stakeholders, and others). However, only six and four studies targeted only service users (women and newborns) and care providers (Figure 3).

The Studies' Methods

Besides, 19 studies combined two or more data collection techniques. The most commonly used method was record review followed by interview and observation of the facility for infrastructure availability. However, only one study directly observed care provision (clinical skill). (Figure 4)

Key Findings

The thematic analysis of included literature yielded three themes: EmONC service utilization, quality of EmONC services, and factors linked with the quality of EmONC services.

Utilization/Crude Coverage of EmONC Services

Of the 32 reviewed studies, 13 reported the crude coverage (use) of the EmONC services.^{25,27,29,31,32,34–39,47,49} It ranged from 3% in 2011 in Ethiopia³² to 73% in 2016 in Togo.²⁷ Studies from Ethiopia and Nigeria reported a high unmet need for EmONC services in which 3%,¹¹ and 3.9%¹⁰ of women with obstetric complications were treated at fully functional EmONC facilities in Ethiopia and Nigeria, respectively, varied significantly by the sub-national administrative structures. The national EmONC assessments from Ethiopia,³⁶ Sierra Leone,³⁵ Ghana,³⁹ Malawi,³⁷ and Gambia³⁸ reported that

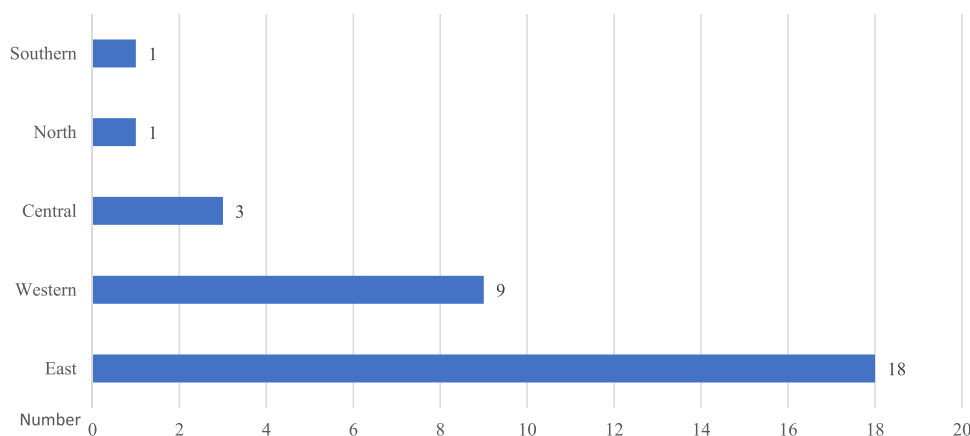


Figure 2 Geographic distribution of included studies, 2022.

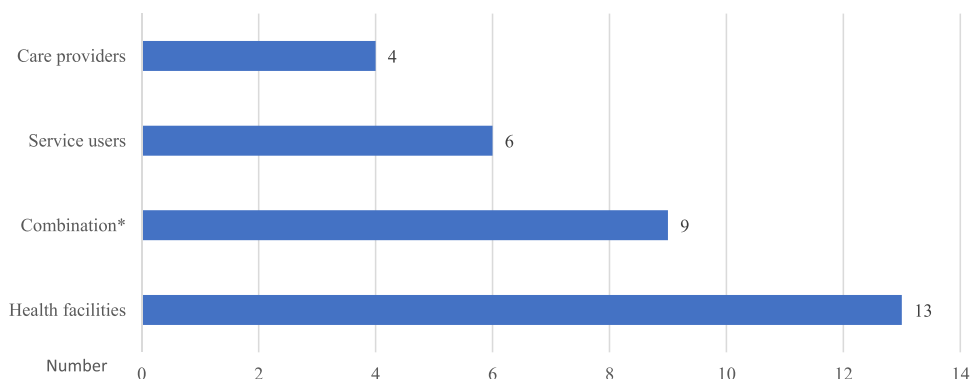


Figure 3 Population of included studies, 2022.

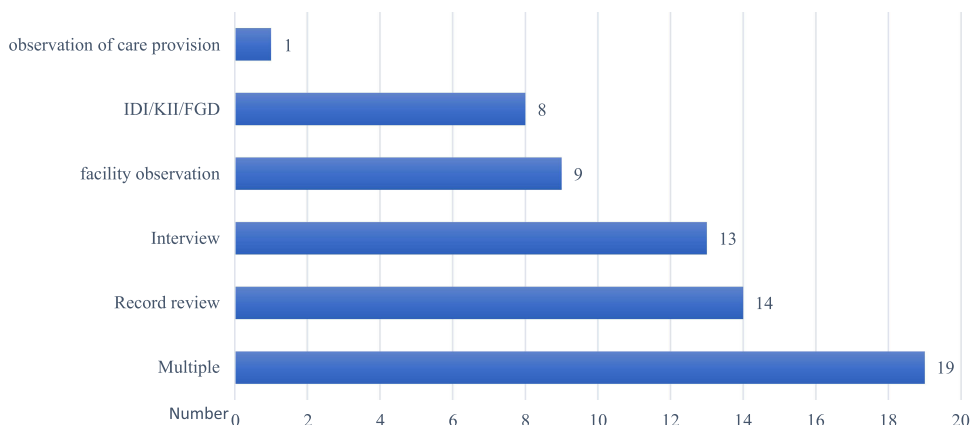


Figure 4 Data collection methods of included studies, 2022.

18%, 20%, 34%, 51%, and 56% of women with obstetric complications were treated at health facilities, with a significant disparity by the sub-national administrative structures.

Four studies have also shown a progressive improvement in EmONC service utilization. A study from Mozambique reported that the EmONC service utilization increased from 20% in 2007 to 26% in 2012.²⁵ A Nigerian study also reported a threefold increase in EmONC service utilization (3.3% to 9.9%) within three years (2012 to 2015). In the same study, the percentage of women who sought care outside health facilities dropped significantly from 8.3% to 3.2%.⁴⁷ Furthermore, studies from Cameroon⁴⁹ and Burkina Faso²⁹ also reported an increasing trend in EmONC service utilization.

Quality of EmONC Services

We also found evidence of the quality of EmONC services measured in various ways. Of the 32 included studies, 27 reported the quality of EmONC services and used a single index or a combination of indices to measure the Quality of EmONC services. The most commonly used methods in the included studies were structure, process quality, perceived quality, and case fatality rates (CFRs) as measurements of EmONC service quality. Most studies reported providing quality EmONC services as the primary challenge, though some reported a progressive improvement.

Structure/Input Quality

Of four articles that assessed the structure/input quality of EmONC services, three reported that none of their facilities performed at the expected level of EmONC service quality (measured using checklist-guided assessment).^{22,24,34} One of the studies said that the quality of EmONC services was inadequate (based on documentation) though some indices indicated excellent and sound levels.³⁰

A study from South Africa reported a 56.7% average drug availability with complete unavailability of some drugs, including parenteral antibiotics, ergometrine, and diazepam.²⁴ Similarly, the essential drugs were unavailable or poorly available in facilities with good infrastructure in a study from Kenya.³⁰ In a study from DRC, the structural quality of EmONC services was 41%, in which face mask, Manual Vacuum Aspiration (MVA), and magnesium sulfate were the least available elements, with a prevalence of 4%, 6%, and 10%, respectively.²² Besides, in a study from Tanzania, facilities did not perform at the expected level for EmONC services, mainly due to the unavailability of essential drugs and the inability to perform vacuum extraction and blood transmission.³⁴

Process/Observed Quality

Only two studies^{30,53} reported the quality of EmONC services using process indicators through direct observation of activities occurring in the clinical setting and documentation of process indicators. An observational study from Egypt reported poor quality of EmONC services (with particular attention on third delay and blood transfusion), ie, only 62% of patient's vital signs were checked, and 93% of patients who needed resuscitation received it. The same study also reported that the average time between physical examination and medical or surgical intervention was three hours, the time spent was not justified on medical grounds by obstetricians in 60% of the cases, and anesthesia was initiated late in >50% of cases.⁵³

However, a multi-site cross-sectional study from Kenya stated a wide interquartile range (IQR) of process indicators, suggesting variable process indicators. The record review revealed that the obstetric history was adequately documented (when documented in >75% of the cases). Still, parity and previous deliveries were graded as moderately adequate (recorded in 51–74%) and inadequate (recorded in <50%), respectively.³⁰

Perceived Quality

Of the 32 included studies, five^{23,28,42–44} reported the quality of EmONC services based on care providers' or receivers' (patients') perspectives on facility infrastructure, care providers' respectful care, or satisfaction with the overall EmONC services. Two studies reported that the average perceived quality ranged from 66.7% in Adigrat, Northern Ethiopia,²³ to 79.4% in Jimma, Western Ethiopia.²⁸

Three studies reported the high quality of EmONC services from participants' perspectives (care receivers or providers).^{28,42,44} For instance, women in a qualitative study in Kenya reported that they experienced improvements in the quality of EmONC services provided after the care providers received training on the EmONC services.⁴² However, in a study from Ethiopia, only 41.2%, 45.2%, and 34.7% of women stated the input, process, and outcome (satisfaction) components as good quality.²³ Besides, a study from Tanzania reported a “good” perceived quality regarding the structure quality of EmONC services but discouraging responses regarding communication with care providers.⁴⁴

Case Fatality

Fifteen of the 32 included studies^{25–27,31,33–39,47–50} used the CFR as a means of the EmONC service quality assessment method. The CFR in the included studies ranged from 1.3% in Togo²⁷ to 11% in Cameroon.⁴⁹ It exceeded the UN-recommended maximum of less than 1% in all the studies except grey literature. Studies from Togo,²⁷ Ethiopia,⁵⁰ Tanzania,³¹ and Nigeria³¹ reported relatively lower direct obstetric CFR, ie, 1.3%, 1.9%, 3%, and 3.2%, respectively. However, studies from DRC,²⁶ Mozambique,²⁵ and Cameroon⁴⁹ reported higher direct obstetric CFR, amounting to 5.1%, 5.2%, and 11%, respectively. However, the Gray literature review of national surveys reported lower CFRs, ranging from 0.8% in Ethiopia³⁶ to 3% in Sierra Leone.³⁵

Ten studies also reported intrapartum and very early neonatal deaths,^{25,27,31,35–39,47,49} ranging from 19.3 per 1000 deliveries in Mozambique²⁵ to 83.7 in Togo.²⁷ The studies reported significant disparities across districts and regions. However, the national surveys of five countries reported relatively similar intrapartum and very early neonatal deaths ranging from 20 per 100 deliveries in Malawi³⁷ to 27 in Gambia.³⁸

The included studies reported improved and worsened CFR trends with varying extent/levels over time. For instance, in Mozambique, the direct obstetric CFR decreased by half (5.2% to 2.8%,) and the stillbirth rate dropped by one-third (29.3 to 19.3/1000 births) in five years.²⁵ However, studies from Nigeria and Cameroon reported a deteriorating trend in quality service. Accordingly, the direct obstetric CFR in a study from Nigeria increased from 3.1% in 2012 to 4.1% in

2015.⁴⁷ Similarly, in a study from Cameroon, the direct CFR and intrapartum neonatal death rate increased by 3% in three years.⁴⁹

Factors Associated with Utilization of Quality EmONC Service

Seventeen of the 32 studies reported the aspects of using Quality EmONC services. The studies reported the socio-demographic factors, maternal behavioral and health service utilization-related factors, and health facility and health system-related factors associated with the utilization of quality EmONC services.

Sociodemographic Factors

Four studies reported that patients' residence, educational status, and age were associated with using quality EmONC service.^{23,43–45} Three studies particularly underlined that the sociodemographic factors were the vital predisposing factors to adverse maternal outcomes, far exceeding the health system's failure.^{23,43,45} For instance, in a study from Tanzania, women's tendency to express their feeling and pain was highly affected by their educational status; only educated women said their emotions and pain during medical/surgical procedures and other obstetric service provisions.⁴⁴ Young age, unemployment, poverty, distance, and residence were reported as barriers to perceived quality EmONC service utilization.^{23,43}

A qualitative exploratory study from Ethiopia also reported very high maternal mortality (>4%) from remotely located facilities.⁴¹ Besides, qualitative research from Ghana indicated that the financial burden exerted on women resulted in maternal death due to inadequate transportation.⁴⁶ A companion's presence was also reported as a facilitating factor, where such mothers (accompanied by their relatives) had a seven times higher risk of obtaining quality EmONC service.^{23,43}

Maternal Behavioral and Health Service Utilization-Related Factors

A qualitative study from Nigeria reported that mothers who visited traditional or religious delivery places come to health facilities lately and face a higher risk of complications and adverse health outcomes. Ignorance, preference for traditional birth attendants, and the cultural preference for vaginal delivery increased the risk.^{23,43} On the contrary, ANC follow-up had higher odds of quality of basic EmONC services.²³ The quality of EmONC service was also associated with women's preference for care providers' sex.⁴³

Health Facility and Health System-Related Factors

The need for more efficiency in resource allocation, particularly scarcity of beds, rooms, supplies, and ambulances, challenged the provision of quality obstetric services in Burundi and Uganda,⁴⁵ Ethiopia,⁴¹ Kenya,⁴⁰ and Nigeria.⁴⁷ This was further explained by a study from Ethiopia, where a unit decrease in satisfaction with the availability of medical supplies decreased the overall clients' satisfaction by 0.23 units.²⁸ Besides, the absence of stationary was a major causal factor for the deficiency of partograph usage in Tanzania.³⁴ The shortage of qualified staff and the increased workload were also reported as barriers to quality EmONC service provision.^{40,42,45–47}

Effective communication was reported as one of the determining factors for delivering quality EmONC services. A study from Ghana reported that a lack of communication hampered pre-referral communication between facilities.⁴⁶ A qualitative explanatory study from Ethiopia also reported that the language barrier affected midwives' ability to provide quality EmONC services.⁴¹ Another study from Ethiopia and Tanzania reported that women's satisfaction was associated with healthcare providers' communication.^{28,44}

Transportation and referral system-related challenges were also raised as determining factors for the delivery of quality EmONC services. Using vehicles other than ambulances was mentioned as a quality-compromising circumstance because of the inability to ensure appropriate care, such as vital sign follow-up and provision of intravenous drips.⁴⁶ Besides, late arrival (as a result of transportation-related challenges) resulted in CFRs in Northern Nigeria.⁴⁷

Healthcare workers' clinical skill gap and training were also identified as factors determining the provision of quality EmONC services. In some contexts, patients presented with advanced complications because of the referring facility's clinical skill gap in recognizing the danger signs on time.⁴⁶ Women's obstetric complications were also poorly managed at the appropriate facility level.⁴³ The insufficient pre-service and in-service training also contributed to poor-quality

EmONC services.^{40,47} Besides, the role of training in providing quality EmONC services was also reported in studies from Kenya, Burundi, and Uganda.^{42,45,48}

The absence of supervision and coordination was also a critical barrier to providing quality emergency obstetric care.^{40,41,45} Nevertheless, the effectiveness of the supervisory role was identified as a controversial issue in cases of routine “traditional” supervision that did not result in the provision of the needed supplies.⁴⁶ Furthermore, poor curriculum,⁴⁵ treatment protocol,⁴¹ policies, and specific action plans⁴³ were reported as factors influencing the delivery of quality EmONC services.

Studies also reported the lack of regulation and monitoring as contributing factors to poor quality service delivery.^{22,41,45} On the contrary, in a study from Nigeria, the increase in CFR was associated with better record keeping.⁴⁷ Studies also revealed that poor staff motivation influenced the provision of quality EmONC services.⁴¹ For instance, in a qualitative study conducted in Burundi and Uganda, demoralization and lack of recognition resulted in staff absenteeism.⁴⁵

Effective Coverage of EmONC Service

The included studies reported evidence on coverage, use, and Quality of EmONC services. Out of the 32 included studies, 13 said both utilization and Quality of EmONC services, whereas 14 reported only the quality of EmONC services. However, none of the studies reported the combined result of EC of EmONC services.

Discussion

This review mapped evidence of EC of EmONC services and factors affecting the quality of services. It revealed a great diversity in the availability of evidence on crude coverage, quality of care, and associated factors. Furthermore, the findings indicated that the evidence of the EC of EmONC services lacked comprehensiveness in Africa.

The estimates of EC are highly relevant since they can show the bottlenecks in achieving better impact.⁵⁴ Despite the EC’s growing and direct relevance in tracking the progress towards SDG 3,⁵⁵ the evidence on EC for the EmONC services lacks, though it exists for other health interventions.⁵⁶ Though studies focusing on the comprehensive estimate for EC of EmONC services were lacking in Africa, the review identified evidence of crude coverage and the quality of EmONC services.

The crude coverage (utilization) of EmONC services was a prioritized topic in the reviewed articles, with 40% reporting it. In addition, wide variations are observed by study time, methods, and country. Although progressing improvements were documented, universal coverage of EmONC services was not achieved in all studies,^{25,29,47,49} only to remain below the WHO’s target. For instance, most of the needed EmONC services are unmet in some countries, ie, 97% in Ethiopia³² and 96.1% in Nigeria³¹ were not addressed. National EmONC assessments, ie, in Ethiopia,³⁶ Sierra Leone,³⁵ Ghana,³⁹ Malawi,³⁷ and Gambia,³⁸ showed significant variations in the EmONC services utilization by the sub-national administrative structures. Unless tailored, contextualized, and accelerated interventions are implemented, it is imminent that most countries will face challenges in achieving the SDG goal of improving maternal and newborn health.

The scoping review showed that providing quality EmONC services remained one of the continent’s most challenging interventions and unattained goals. Few studies.^{11,14} have shown an improvement in the quality of EmONC services over time, and most (84%) studies relied on one or more of the Donabedian quality triads. The input and process components were less emphasized in the reviewed studies, while the majority (62.5%) focused on the outcome indicators. Despite the relevance of the facilities’ settings, care providers’ qualification, and administration,¹¹ the current review revealed that evidence on the structural quality of EmONC service is limited in Africa. Furthermore, the review showed poor structural quality. It has also demonstrated poor adherence to the standards of care, including inadequate documentation of the patient’s past medical history³⁰ and inadequate clinical actions.⁵³ Despite its relevance to evaluating the content of care,¹⁴ the review underlined that the process component of EmONC services quality is overlooked in Africa.

On the contrary, the outcome quality of EmONC services was more researched and had a variable level. However, the review identified the methodological and analytical inconsistencies across studies as a primary challenge to the comparability of the results, implying the need for uniform (harmonized) techniques. The direct obstetric case fatality rate (DOCFR), the proportion of women admitted to an EmONC facility with major direct obstetric complications or

who develop such complications after admission, and die before discharge, is one of the proxy measures to assess the quality of EmONC services.⁸ Although CFR's methodological approach is relatively consistent among the included studies, the findings vary. Besides, though evidence underlined complementing it with other valid indicators (since the absence of case fatality in primary health care facilities does not necessarily indicate higher quality),⁸ the review revealed that the included studies lacked triangulation of their findings to render a better understanding of EmONC service quality. Nonetheless, most reviewed articles exceeded the UN-recommended minimum level, implying the tension behind the progress toward achieving SDG goal 3.⁷

The review also identified the factors linked with providing quality EmONC services. The sociodemographic characteristics (patients' residence, educational status, age, unemployment, poverty, distance, and place) and maternal behavioral and health service utilization-related factors (ignorance, preference for traditional birth attendants, culture, ANC follow-up, and care providers' sex preference) impacted the provision of quality EmONC services. Besides, the health facility and health system-related factors such as resource allocation, staff motivation, transportation and referral system, training, curriculum and treatment protocol, policies, and specific action plans have positively or negatively influenced the provision of quality EmONC services. Hence, interventions pointing at the identified factors could help improve the EC of EmONC services. For instance, staff motivation was cited in the reviewed articles as an essential factor influencing the provision of quality EmONC services.^{40,54} Interventions, including most Results-Based Financing (RBF), positively impacted the motivation of care providers to improve their performance.^{54,57,58} Similar evidence from LMICs supported the application of such interventions to improve care providers' commitment and feelings of professionalism, which subsequently lead to receivers' satisfaction.^{57,58}

Limitation

This study only includes studies published in English on Jan 01, 2011 – Dec 31, 2020, so studies published in other languages were excluded from the review despite their significance to the study's scope.

Conclusion

Evidence of EC of EmONC services lacks comprehensiveness (with regard to the three components: need, use, and quality) in Africa. However, the review explored evidence on crude coverage and quality of EmONC services with a wide variability across studies, study period, and sub-national administrative structures. The utilization of EmONC services was lower than the WHO-recommended 100% in all studies, though some reported a progressive improvement. The variation in the quality of EmONC services and assessment techniques was observed in the review, which has shown wide disparity across studies. In addition to the scarcity of evidence on the structural quality of EmONC services in Africa, the review explored the inadequacy of structural quality, particularly essential drugs and equipment. Furthermore, despite their drawbacks, the perceived quality and CFRs were widely researched in the review, while very few studies assessed the content of care for EmONC service quality.

The perceived quality of EmONC services has shown a variable level (very low to high) in the continent. However, the methodological and analytical inconsistencies across studies ultimately resulted in difficult comparability of the results, implying the need for uniform (harmonized) techniques. The high CFRs in the review indicated the low outcome quality of EmONC services. However, studies did not complement their results with other assessment techniques since lower CFRs do not necessarily mean better quality. The review further explored and identified sociodemographic, maternal behavioral, and health service utilization-related factors influencing the utilization of quality EmONC services in Africa.

Recommendation

The incongruity of EmONC service quality assessment methods needs to be harmonized to trace and compare the progress toward achieving the SDG goals in the continent. We also recommend robust data collection systems and incorporating indicators that better reveal the quality of EmONC services, mainly content of care components. Furthermore, a comprehensive (that encompasses all its components) study is suggested to understand the EC of EmONC services in Africa.

Abbreviations

BEmONC, Basic Emergency Obstetric and Newborn Care; CEmONC, Comprehensive Emergency Obstetric and Newborn Care; CFR, Case Fatality Rate; DHS, Demographic and Health Survey; DOCFR, Direct Obstetric Case Fatality Rate; DRC, Democratic Republic of Congo; EC, Effective Coverage; EmONC, Emergency Obstetric and Newborn Care; EmOC, Emergency Obstetric Care; FGD, Focus Group Discussion; IDI, Individual In-depth Interview; IQR, Inter-quartile Range; JBI, Joanna Briggs Institute; KII, Key-Informant Interview; LMIC, Low and Middle-income Country; MMAT, Mixed Methods Appraisal Tool; MeSH, Medical Subject Heading; OSF, Open Science Framework; PCC, Population, Concept, and Context; PRISMA-ScR, Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews; SDG, Sustainable Development Goal; UNICEF, United Nations Children's Fund; WHO, World Health Organization.

Data Sharing Statement

All data used for this study are cited and presented as references.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Disclosure

The authors report no conflicts of interest in this work.

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