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Implementation of Maternal and Perinatal Death Surveillance and Response (MPDSR) in Developing Countries: A Scoping Review

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ABSTRACT

Despite the World Health Organization's continued advocacy for the adoption of Maternal and Perinatal Death Surveillance and Response (MPDSR) as a systematic approach to uncovering and addressing the root causes of maternal and perinatal mortality, death rates within these populations remain alarmingly high in many regions. The effectiveness of MPDSR varies widely across settings, often limited by weak health information systems, reporting delays, blame-oriented cultures, and poor follow-up of audit recommendations. This scoping review aims to examine the practical application of MPDSR across various real-world contexts, with a particular emphasis on the mechanisms for identifying, reporting, evaluating, and responding to maternal and perinatal deaths, as well as the factors that enable or hinder these processes. Peer-reviewed publications from the past decade were systematically retrieved from major databases, including PubMed, Wiley, and ScienceDirect. The review identified key barriers such as shortages of skilled personnel, incomplete documentation, and limited financial and monitoring resources, while effective MPDSR was facilitated by community engagement, clear reporting systems, and supportive policies. These findings highlight the need to strengthen workforce capacity, data systems, and governance to reduce preventable maternal and neonatal deaths.

Perinatal Death
Scoping Review
Surveillance

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Introduction

Despite being long-standing issues in global health, maternal and neonatal mortality are not inevitable. In places where targeted interventions have been applied, substantial improvements have been observed. With an estimated 287,000 women dying annually due to pregnancy-related complications, and an estimated 2.3 million neonatal deaths and 1.9 million stillbirths, there is significant room for improvement. Notably, more than 40% of these stillbirths are reported to occur during labor. A considerable number of these deaths could be averted through the consistent application of established, evidence-informed healthcare interventions. Research suggests that up to half of maternal deaths and 58% of neonatal deaths could be averted by improving the quality of health services [1] [2].

Addressing maternal and perinatal deaths that are preventable requires more than just clinical protocols; it also depends on the commitment and coordination of healthcare workers and policy leaders. Recognizing this, WHO and UNFPA issued guidelines to link surveillance systems with prevention strategies. In 2018, these guidelines were expanded to include perinatal mortality as a key component. Despite increased global awareness, many high-burden countries still lack reliable systems for recording mortality data [3].

The World Health Organization (WHO) has advocated for the implementation of the Maternal and Perinatal Death Surveillance and Response (MPDSR) system, a system whose effectiveness depends on the engagement of key stakeholders within the health system. Numerous low- and middle-income countries have progressively adopted this system, which was developed to enable the systematic identification, analysis, and review of maternal and perinatal death cases, supporting the formulation of actionable strategies that reduce recurrence. The MPDSR model has received formal endorsement from WHO and has been incorporated into technical guidance on maternal and perinatal mortality, released in 2013 and 2016. By 2018/2019, national policies in 126 and 100 countries had integrated the MPDSR framework [4] [5].

Although the MPDSR system has been widely adopted, many low- and middle-income countries continue to encounter practical challenges in its implementation. In Ethiopia, for example, a study highlighted that health facilities showed limited readiness in handling maternal mortality data, with deficiencies noted in reporting, record-keeping, and follow-up actions [6]. This highlights a persistent gap between policy adoption and actual practice. Similarly, a comparative study in five countries affected by crisis identified several impediments to the success of MPDSR, including entrenched blame cultures, insufficient

training, fragile information systems, and weak policy environments [7]. These findings underscore the importance of tailoring approaches to local contexts and prioritizing the development of evidence-based systems for mortality reporting.

A literature review is thus necessary to gain a more comprehensive understanding of how cases are identified, reported, and assessed, alongside the broader contextual elements that may facilitate or hinder the implementation of MPDSR. This scoping review aims to map and synthesize the existing literature on how MPDSR is operationalized, with particular attention to its identification, reporting, assessment, and response functions in cases of maternal and perinatal deaths. This review also examines the underlying factors that affect the effectiveness of MPDSR in various settings. Understanding these dynamics can help identify what changes are needed to reduce avoidable maternal and perinatal deaths.

Material and Method

A. Research Design

In exploring how Maternal and Perinatal Death Surveillance and Response (MPDSR) has been implemented across low- and middle-income countries, this scoping review draws on a diverse range of sources. Rather than focusing solely on outcomes, the review emphasizes patterns of practice and recurring barriers within varied health system contexts. We followed the widely adopted methodological framework introduced by Arksey and O'Malley (2005), further refined by Levac et al. (2010), which outlines a step-by-step process involving the formulation of the research question, identification and selection of the literature, data extraction, analysis, and synthesis.

Our guiding research question was: *How is the implementation of MPDSR described in the scientific literature within the context of developing countries?* This question helped structure our analysis around key dimensions, including enabling and constraining factors, the roles of relevant stakeholders, and the broader health systems and policy environments in which MPDSR is situated.

B. Inclusion Criteria

This review considered empirical studies, as well as programmatic reports, that employed qualitative, quantitative, or mixed methods, to examine the implementation of Maternal and Perinatal Death Surveillance and Response (MPDSR) in low- and middle-income countries. Eligible publications were limited to those published in English or Indonesian between 2015 and 2025. Studies such as systematic or scoping reviews, meta-analyses, theoretical papers lacking primary data, and publications unrelated to the implementation of MPDSR were excluded from the analysis. Data were retrieved from scientific databases, including *PubMed, Wiley Online Library*, and *ScienceDirect.* The search also involved additional sources such as manual searches through Google Scholar. The search was conducted using a combination of

keywords and Boolean Operators: ("Maternal and Perinatal Death Surveillance and Response" OR MPDSR OR "Maternal Death Audit" OR "Perinatal Death Audit") AND (Evaluation OR Implementation OR "Program Assessment"), MeSH Terms were used to ensure a more specific search: ("Maternal Mortality"[MeSH] OR "Perinatal Mortality"[MeSH]) AND ("Program Evaluation"[MeSH] OR "Health Program Implementation"[MeSH]), truncation was used to cover keyword variations: ("Maternal and Perinatal Death*" OR MPDSR OR "Maternal Death Audit*" OR "Perinatal Death Audit*") AND (Evaluate* OR Implement* OR Assess*).

C. Search Outcome

The PRISMA-ScR framework was used to select studies for this review. Initially, 266 records were gathered from three electronic databases, PubMed, ScienceDirect, and Wiley Online Library, along with eight additional records identified manually. After excluding 17 duplicates, 257 titles and abstracts were reviewed for relevance. After the preliminary screening, 39 articles advanced to full-text evaluation. Thirteen were excluded due to lack of access to the complete text, while twelve were deemed irrelevant based on the intervention criteria established for this review. A total of 14 studies were included in the final analysis. The selection aimed to ensure the inclusion of studies that were both methodologically sound and relevant to the topic.

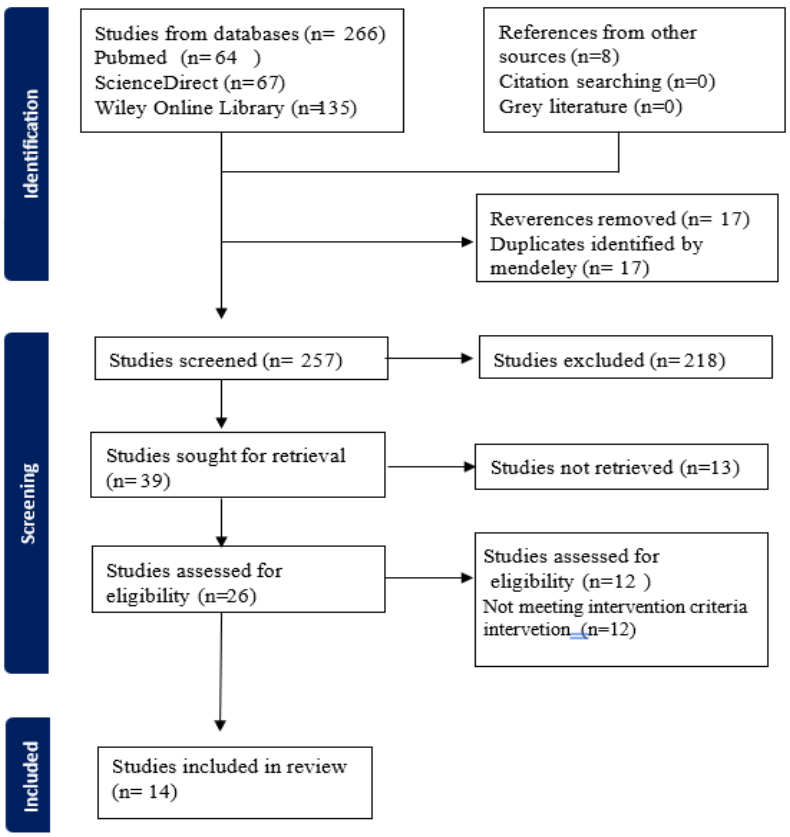


Figure 1. Prisma diagram

Results

The 14 studies analyzed covered a wide range of geographical regions, with the most extensive distribution from Ethiopia (3 studies) and Tanzania (2 studies), and 1 study each from Zimbabwe, Jordan, South Africa, East Africa, the Sub-Saharan region, crisis-affected countries (such as Bangladesh, Uganda, South Sudan, Palestine and Yemen) and refugee camp contexts. The research designs were classified through the data extraction process and further analyzed. Five studies were qualitative, three used *cross-sectional* designs, two employed *mixed-methods study designs*, two were descriptive quantitative, one was a case study, and one was desk research. Of the 14 articles assessed using the JBI (12 articles) and MMAT (2 articles) tools, 10 were categorized as high quality (category A), and four as moderate quality (category B). Each study was analyzed based on country and region, study design and approach, service context, focus of MPDSR implementation stages (identification, reporting, assessment, and response), and key findings, barriers, and supporting strategies. The results of the data extraction process from all selected studies are outlined in Table 1.

Table 1. Data Charting

Ref.	Country/ Service Context	Study Design	MPDSR Stages	Key findings	Barriers	Supporting Factors
A1 [8]	Ethiopia/ RS	*Qualitative study*	All stages	Dishonest reporting due to fear of law and litigation	*Blame culture*, fear of sanctions	Policy support, national guidelines
A2 [9]	Tanzania/ Primary health care facility	*Cross-sectional*	Report, assess -ment	No evidence of change based on audit results	Lack of guidelines, minimal training	Formal system in place, MPDSR coordinator
A3 [10]	Ethiopia/ hospital and health center	*Cross-sectional*	All stages	Low reporting coverage and quality	Limited human resources, lack of training	Sector collaboration, community participation
A4 [11]	Sub-Saharan Africa/ Health Facilities	*Mixed-Method*	All stages	Poor documentation, non-specific review results	Low motivation, blame culture	The audit team has been trained
A5 [12]	UNHCR East and Horn of Africa and Great Lakes Region/ Camp. Refugee Camps	*Quantitative* descriptive analytic	All stages	Incomplete audit, late reporting	HR constraints, weak documentation	System support & community engagement
A6 [13]	Tanzania/ Hospital	*Qualitative study*	All stages	Internal audit is well established through community engagement and collective review.	-	Management engaged, community reporting.
A7 [14]	Jordan/ Hospital	*Cross-sectional*	All stages	Incomplete documentation hinders the whole process	Legal fear, lack of an information system	-

Ref.	Country/ Service Context	Study Design	MPDSR Stages	Key findings	Barriers	Supporting Factors
A8 [15]	Sub-Saharan Africa/ Health Facilities	*Mixed-Method*	All stages	Weak documentation system and data accuracy	High workload, no incentives	Staff commitment, multidisciplinary participation
A9 [16]	Zimbabwe/ District Health Facility	Descriptive quantitative	All stages	Many deaths are not reported or are reported late	Forms not available, limited human resources	-
A10 [17]	Bangladesh, Uganda, South Sudan, Palestine, and Yemen/ Camp. Refugee Camps	Case Study	All stages	Implementation varies, still pilots	Infrastructure damaged, data inaccurate	International agency support
A11 [5]	Camp countries. Refugee/ Humanitarian crisis	Consultative Qualitative Study	All stages	The data was manipulated due to reputation	*Blame culture*, limited infrastructure	Strong leadership, collaborative approach
A12 [18]	Ethiopia/ National	Multi-sited qualitative case study	All stages	Only 10% of maternal deaths were reported	Underreporting, limited budget	National guidelines, increased awareness
A13 [19]	South Africa/ hospital	Qualitative - Multiple Case Study	All stages	Audits become routine practice	Limited human resources, change resistance	Integration of audit into the system, use of PPIP
A14 [20]	Sub-Saharan/ Regional Africa	Descriptive desk research	All stages	Low level of reporting and implementation of recommendations	Limited budget, lack of regulatory strategy	Electronic reporting, socialization campaign

As outlined in Table 1, the majority of the included studies indicate that MPDSR implementation remains suboptimal across its core stages—identification, case reporting, analysis, and response. These limitations are commonly linked to systemic barriers, including inadequate infrastructure, prevailing socio-cultural dynamics, and shortages in both workforce and funding. To uncover recurring insights across the literature, a thematic synthesis was applied, integrating both inductive and deductive analytical approaches. In addition to the main MPDSR phases, the review highlighted several overarching factors at the organizational level both facilitators and constraints that significantly shape the operationalization of MPDSR in varied contexts. The results of this analysis formulated key themes and their subthemes that reflect both challenges and strategies in MPDSR implementation across contexts (Table 2).

Table 2. Mapping Data

Reference Number	Tema	Sub Tema
[8], [11], [14], [5]	Identification	1. Limitations in medical documentation
[8], [10], [7]		2. Lack of trained health workers
[8], [12], [5], [20]		3. Health workers' concerns about sanctions or lawsuits
[9], [10], [12], [5], [18]		4. Absence of a standardized mechanism in death detection and reporting
[12], [7], [5], [20]	Reporting	1. Delay in Reporting
[8], [9], [16], [5]		2. Incomplete documentation
[16]		3. Inconsistency in filling out death forms
[10], [16], [18], [20]		4. Lack of national guidelines and written policies
[14], [16], [20]		5. Consequences of low compliance in reporting
[8],[9],[10],[14],[7],[5]	Assesment	1. Limited resources
[9], [14]		2. Lack of adequate training
[8], [7]		3. Limited data for analysis
[8], [14], [5]		4. Blame culture in mortality evaluation
[11]		5. Death review meetings are not regularly held
[5], [9]	Response	1. Lack of a monitoring and evaluation system
[16], [20]		2. Limited budget and resources
[8], [11], [21]		3. Lack of Accountability in Recommendation Implementation
[9]		4. Lack of evidence of change in clinical practice
[11]		5. Ineffective quality improvement cycle
[10], [13], [5]	Support	1. Community and multi-sectoral engagement
[13]		2. Structured reporting system
[21]		3. Health worker training and capacity
[21]		4. Policy and leadership support
[19]		5. Integration with the health system
[8], [14], [20]	Barriers	1. Blame culture and fear of sanctions
[8], [9], [10], [14], [7]		2. Limited resources
[8], [10], [14], [18]		3. Poor documentation
[8], [10]		4. Weak follow-up
[13], [7], [5], [20]		5. Socio-cultural barriers
[7], [5]		6. Conflict and humanitarian crisis
[9], [14], [16]	Recomendation	1. Training
[5], [20]		2. Strengthening the reporting system
[7], [5]		3. Human Resources allocation

A. Identification

Identification of maternal and perinatal deaths remains challenging in most studies due to limited medical documentation, inaccurate recording, and health workers' fear of sanctions or prosecution [8][10][18][20]. In Ethiopia, only about 10% of maternal deaths are reported, while in East African refugee camps, deaths often go unrecorded, especially during the referral process [12][5]. This is in line with the findings that fear of litigation inhibits truthful reporting in developing countries [22][23].

B. Reporting

Inconsistent MPDSR reporting remains a significant obstacle, mainly due to the absence of national guidelines, inadequate information systems, and prolonged reporting delays. In Tanzania, few facilities have written policies on MPDSR [2], while in refugee camps, reporting can be delayed by more than a month [5]. A culture of blame and concern for institutional

reputation also encourages data manipulation [8][5][18]. These barriers are exacerbated by staff fatigue, lack of written guidance, and incomplete documentation [24][25]. A systematic review [22] concluded that untimely reporting and a lack of valid data are triggers of the "cycle of failure" syndrome, leading to demotivation and decreased MPDSR engagement.

C. Assessment

Not all facilities hold regular review meetings, and the quality of assessments is often low due to understaffing, training, and a culture of blame [8][9][11][18][20]. 2 Study confirm that a culture of blame and lack of local capacity undermines the quality of MPDSR assessments [23] [26]. In line with the literature, which shows that low-quality narrative summaries and action plans are not measurable, as seen in reports from studies in Tanzania and Nigeria [25].

D. Response

The response phase emerged as the most underperforming component of the MPDSR cycle. In many studies, although recommendations were formulated, follow-ups were inadequately implemented or even ignored [8][11][20]. Barriers such as limited budgets, minimal human resources, and the absence of monitoring systems emerged in many studies [9][16][5][20]. A review of reports in 32 LMICs found that while recommendations were often presented, <30% follow-up was seen in subsequent reports, indicating weaknesses in the response system [27].

E. Supporting Factors

Several enablers were identified, despite the prevailing challenges, as revealed by the analyzed studies. Community engagement, strong leadership, national policies, and structured training and reporting systems have been important in supporting the successful implementation of MPDSR[10][13][21][5]. In South Africa, for example, the integration of audits into routine systems and the use of PPIP software have helped to make perinatal audits a sustainable practice [19]. This is consistent with the MPDSR global review that policy support, leadership, and a culture of learning without blame are critical success factors characteristic of effective "action cycles" [15] [23].

F. Barriers

Various systemic barriers affect MPDSR implementation. Blame culture, fear of litigation, and lack of legal protection for whistleblowers are recurring issues [8][14][18]. In conflict countries and refugee camps, limited infrastructure, workforce, and security compound the challenges [5][7]. The scoping review identified several barriers to the implementation of MPDSR, including resource constraints, a prevailing blame culture, inadequate documentation, inaccurate data reporting, and limited action on follow-up recommendations [17].

G. Recommendations

To enhance the implementation of MPDSR, various studies suggest ongoing capacity-building for health workers, improving reporting mechanisms through digitalization and standardization, and assigning a specific coordinator to maintain audit continuity [9][14][16][7][5][20]. Additionally, the need for context-specific training and broader system-level support is particularly emphasized in regions affected by humanitarian crises [17].

Discussion

Across numerous low- and middle-income countries, including those affected by humanitarian emergencies, the operationalization of MPDSR is still constrained by entrenched systemic and structural limitations. These difficulties span the entire MPDSR process, from case identification and reporting to review and response, highlighting persistent weaknesses in essential health system components, including record-keeping, workforce capacity, and accountability structures [1-14]. These interconnected challenges frequently undermine the continuity of surveillance activities and the translation of mortality findings into meaningful improvements in clinical practice. Addressing these limitations requires coordinated interventions that strengthen both institutional capacity and routine health service delivery.

Maternal and neonatal mortality reporting and review mechanisms are frequently excluded from national health information systems (HMIS), limiting the capacity for consistent, data-informed analysis. [22] [15]. The case study in Bangladesh demonstrates that, despite the MPDSR information system being digitized since 2014, challenges such as incomplete data, inadequate monitoring, and irregularities in review meetings continue to hinder the program's effectiveness [28]. However, an approach based on dashboards, scorecards, and action plans, down to the managerial level, is considered to strengthen the utilization of information for contextualized, local interventions. Integrating mortality surveillance data into existing information systems may improve reporting consistency, facilitate timely identification of service gaps, and support decision-making across different administrative levels. Nevertheless, digital infrastructure must be accompanied by appropriate staff training, data verification procedures, and regular performance evaluations.

Fear of legal sanctions or litigation also creates a blame culture that inhibits honest reporting and constructive evaluation [8][14][5]. This phenomenon highlights the limited application of the 'no-blame' culture principle in clinical audit, a key element of the WHO Quality of Care Framework [4]. Establishing confidential review procedures and encouraging multidisciplinary participation may help create a supportive environment in which healthcare professionals can openly discuss preventable deaths and identify systemic weaknesses without fear of individual punishment.

In terms of response, many studies show that audit recommendations are often not systematically followed up on or even ignored [8][11][21]. The absence of monitoring systems and low institutional accountability reflect weak data-driven learning, which should underpin quality improvement in maternal and infant care [9][5]. A study in Ethiopia found that, despite the integration of death reporting into weekly surveillance, data accuracy and completeness remain low. The lack of training and analysis at primary facilities also hinders the effectiveness of audit responses [29]. A review of 32 MPDSR documents originating from various low- and middle-income settings revealed that fewer than 30% of the proposed recommendations were implemented. This indicates a persistent gap in completing the cycle of quality improvement within maternal and perinatal health services. [27]. To address this implementation gap, audit recommendations should be translated into measurable action plans with designated responsibilities, realistic timelines, and clearly defined monitoring indicators. Regular institutional feedback mechanisms are also necessary to assess whether corrective actions produce observable improvements in healthcare delivery.

Several studies have reported effective implementation of MPDSR in specific country settings. In South Africa, for example, the system has been integrated into hospital quality improvement structures through the Perinatal Problem Identification Program (PPIP), which is supported by national policies and ongoing staff training [19]. This suggests that the success of MPDSR largely depends on the presence of a responsive health system, robust governance, and strong leadership commitment to the audit process as a tool for ongoing quality improvement. Additionally, it illustrates how structural barriers, such as limited follow up, fragmented data use, and weak accountability can be addressed through integrated governance, strong leadership, and sustained capacity building. Such experiences provide useful lessons for adapting institutional arrangements and strengthening the connection between mortality reviews, clinical supervision, and routine quality improvement activities in resource-constrained settings.

At the global level, MPDSR is aligned with international goals, including the Ending Preventable Maternal Mortality (EPMM) strategy and Sustainable Development Goals 3.1 and 3.2. WHO and UNFPA have emphasized that mortality audits should not operate in isolation as vertical programs, but should instead be integrated into national health systems within a broader framework of health system strengthening and quality accountability [4] [30]. Greater policy alignment may promote sustainable financing, standardized reporting mechanisms, and stronger institutional ownership of mortality surveillance and response activities.

Logistical disruptions, safety concerns, and insufficient technical capacity frequently hinder the implementation of MPDSR in conflict-affected and humanitarian settings. Literature suggests that effective responses in such environments require intersectoral coordination and

audit methods that are adaptable to the complex and changing field conditions [17]. Flexible reporting procedures, decentralized review mechanisms, and collaboration with humanitarian organizations may therefore help maintain surveillance continuity when conventional health system structures are disrupted.

Policy and Practice Implications

Based on these findings, strengthening the implementation of MPDSR needs to be done through the following steps :

1. Integrate the maternal and infant mortality audit process into the national health information system to enable real-time data-based monitoring and evaluation of policy impacts
2. Reform regulations to create an environment that supports a culture of learning and provides legal protection for whistleblowers, thereby encouraging openness and honesty in reportingMeningkatkan kapasitas teknis dan kepemimpinan tenaga kesehatan melalui pelatihan yang berkesinambungan, khususnya di wilayah terdampak krisis
3. Enhance the technical capacity and leadership of healthcare workers through ongoing training, particularly in areas affected by crisis.

MPDSR must be an integral part of a national quality strategy and health governance system that is accountable, transparent, and oriented toward learning. MPDSR can only reach its potential as a tool for saving the lives of mothers and babies through multisystem integration and support across local, national, and global levels.

Conclusion

The findings of this review indicate that efforts to implement Maternal and Perinatal Death Surveillance and Response (MPDSR) across low- and middle-income nations, including those facing humanitarian emergencies, continue to encounter a range of challenges throughout each stage of the process, from identifying and reporting cases to conducting assessments and taking action. These obstacles are primarily related to weaknesses in documentation systems, limited human resources, a lack of accountability mechanisms, and a culture of blame that undermines transparency and the effectiveness of audits. This review highlights a gap in our understanding of how MPDSR is applied, particularly in conflict-affected areas. It shows that fear of legal consequences or institutional blame can lead health workers to avoid or distort reporting. At the same time, it also highlights what enables MPDSR to work effectively in practice, such as having strong leadership, integrating the system with national health information platforms, and providing regular training and supervision to those involved. This review provides a valuable synthesis of implementation conditions across various settings, highlighting specific areas that could be strengthened to enhance program outcomes.

Nonetheless, the review has certain constraints, particularly due to the methodological variability among included studies and the limited representation of data from regions affected by conflict. Therefore, further longitudinal and contextual research is needed to evaluate the impact of policies, reporting system innovations, and legal protections for reporters in supporting a safe, transparent, and quality-oriented audit culture for maternal and neonatal care.

Limitation

This review has a few limitations. First, only a small number of studies were included. It is not that there was no relevant research available, but the review applied particular criteria, selecting only studies that directly explored how MPDSR was implemented in practice. This decision made the review more targeted, though it inevitably excluded certain viewpoints that might have contributed additional insights. A further limitation lies in the fact that several studies lacked precise demographic details, such as information about participants' identities, roles, or their geographical location, which made it more difficult to interpret how context may have influenced the implementation. As a result, it was challenging to determine how personal or local factors impacted the implementation process. Even so, since most studies focused on broader systems and policy levels, this gap likely did not significantly weaken the key takeaways.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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