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Maternal and child health care services: prevention of complications, reduction of maternal, neonatal and child morbidity and mortality rate: A narrative review

Vilma Ajijul Jana

Management and Science, University Shah Alam Malaysia

Corresponding author: vilma_ajijul@msu.edu.my

Abstract

Background: Maternal and child health (MCH) services are critical interventions that improve maternal and child health outcomes globally.

Purpose: To review maternal and child health services: prevention of complications, reduction of maternal, neonatal, and child morbidity and mortality rates: Narrative review

Method: A narrative review method was used to synthesize current evidence on effective MCH interventions.

Results: Evidence from global and regional literature highlights effective interventions including antenatal care, skilled birth attendance, emergency obstetric care, postnatal care, immunization, and nutrition programs.

Conclusion: The need for strengthened health systems, community participation, and policy support is emphasized to achieve Sustainable Development Goals (SDGs) 3.1 and 3.2.

Suggestion: Implementing frequent CHW home visits is vital in the Prevention of Complications, Reduction of Maternal, Neonatal and Child Morbidity and Mortality Rate. Aim for multiple visits during both antenatal and postnatal periods, as the strongest neonatal mortality reduction (24%) occurred in studies with ≥ 3 visits and integrated antenatal plus postnatal care, Package interventions into comprehensive home-based care

Keywords: Child Health; Maternal Health; Morbidity Reduction; Neonatal Mortality; Preventive Interventions.

INTRODUCTION

Maternal and child health remains a public health priority worldwide. Despite progress, approximately 295,000 women die annually from preventable causes related to pregnancy and childbirth, while 2.4 million neonatal deaths and 5 million under-five deaths occur each year (World Health Organization, 2022). Sustainable Development Goals 3.1 and 3.2 emphasises preventing maternal deaths and reducing neonatal mortality by 2030. As of 2020, the global maternal mortality ratio was approximately 223 per 100,000 live births, and neonatal mortality rate was 17 per 1,000 live births (World Health Organization, 2023; UNICEF, 2023).

Intensifying preventive and curative MCH services could avert up to 4.2 million maternal, neonatal, and child deaths annually by addressing the most

common causes of mortality (Bhutta, Das, Rizvi, Gaffey, Walker, Horton, & Black, 2013). While these interventions are proven effective, implementation barriers such as workforce shortages and health inequities persist. In Malaysia, found that, staff shortages and misdistribution of health workers left remote indigenous villages under-served. Integrating community-based approaches and health education could enhance outcomes in Malaysia and similar contexts (Chew, Lim, Low, Lau, Kari, Shamsudin, & Rajan, 2022). Strategic investments and targeted policies are crucial to ensure healthier futures for women and children globally. As of 2020, the global maternal mortality ratio was approximately 223 per 100,000 live births (World Health Organization, 2023). Neonatal mortality rate was 17 per 1,000 live births

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globally (UNICEF, 2023). This statistic implies an accelerated efforts to reach the SDG target.

Therefore, this narrative review is driven by these critical factors that underscore its global importance: Persistent Global Health Challenges: Despite advancements, maternal and child mortality rates remain high, especially in low- and middle-income countries. The World Health Organization (WHO) reports that most maternal deaths are preventable with access to quality care during pregnancy, childbirth, and the postpartum period. Preventability of Deaths: A significant number of maternal and neonatal deaths are due to preventable causes such as postpartum haemorrhage, infections, and complications from preterm births. Implementing evidence-based interventions can substantially reduce these fatalities (Gülmezoglu, Lawrie, Hezelgrave, Oladapo, Souza, Gielen, & Hofmeyr, 2016). Need for Quality and Continuity of Care: Effective maternal and child health services require a continuum of care from prenatal to postnatal periods. Studies highlight that community-based interventions and consistent care can lead to a 25% reduction in neonatal mortality (Lassi, Haider, & Bhutta, 2012).

Addressing Health Disparities: There are significant disparities in maternal and child health outcomes across different regions and populations. Factors such as socioeconomic status, education, and access to healthcare services contribute to these inequities. A comprehensive review can identify these gaps and suggest targeted interventions (Anyanwu, Maduka, Ayo-Farai, Okongwu, & Daraojimba, 2024).

RESEARCH METHOD

A narrative review methodology was utilised to synthesise current evidence on effective MCH interventions. Literature searches were conducted using PubMed, WHO databases, and Google Scholar from 2016 to 2023 - electronic databases were systematically explored: PubMed/MEDLINE – for biomedical and clinical studies; Scopus – for multidisciplinary and global research coverage; Web of Science – for citation tracking and quality peer-reviewed literature; ScienceDirect – for access to full-text scientific articles; Google Scholar – to identify additional grey literature and non-indexed relevant articles; WHO, UNICEF, and CDC websites – for global health reports, guidelines, and policy

documents. Keywords included “maternal health,” “child health,” “neonatal mortality,” “preventive interventions,” and “morbidity reduction.”

Inclusion criteria focused on systematic reviews, WHO, UNICEF guidelines, and key global reports addressing interventions in low- and middle-income countries. Articles are compiled in a computer file, thoroughly validated, analysed and synthesized. Articles not in English or lacking direct relevance to preventive MCH services were excluded.

RESEARCH RESULTS

Maternal Health Care Services

1. Antenatal Care (ANC)

ANC plays a crucial role in preventing maternal morbidity and mortality by early identification and management of pregnancy complications such as pre-eclampsia, infections, and anaemia. ANC attendance is directly linked to reduced maternal and perinatal mortality. Inadequate ANC increases the risk of maternal mortality by up to threefold due to missed opportunities for early diagnosis and intervention (Hlongwane, Bozkurt, Barreix, Pattinson, Gülmezoglu, Vannevel, & Tunçalp, 2021). Women who attended at least four ANC visits had a 42% lower risk of maternal complications such as severe bleeding, hypertensive disorders, and infections compared to women with no ANC visits (Neupane & Doku, 2013). WHO recommends at least eight ANC contacts to improve maternal and fetal outcomes.

2. Skilled Birth Attendance and Emergency Obstetric Care

Skilled birth attendance and access to emergency obstetric care are essential for preventing maternal deaths from obstructed labour, haemorrhage, sepsis, and hypertensive disorders. Quality intrapartum care is the most critical period for saving maternal and newborn lives. Recent studies found that skilled care during delivery prevents life-threatening complications, including obstructed labour, postpartum haemorrhage, and sepsis by ensuring timely interventions and referrals (Koblinsky, Moyer, Calvert, Campbell, Campbell, Feigl, & Langer, 2016). Access to comprehensive emergency obstetric care (CEmOC) remains crucial in reducing maternal deaths from direct causes such as haemorrhage, sepsis, obstructed labour, and hypertensive disorders.

Vilma Ajijul Jana

Management and Science, University Shah Alam Malaysia
Corresponding author: vilma_ajijul@msu.edu.my

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Scaling up CEmOC coverage has been shown to reduce maternal mortality ratios by up to 75% in high-burden countries (Campbell, Calvert, Testa, Strehlow, Benova, Keyes, & Bailey, 2016).

3. Postnatal Care

The first 48 hours after childbirth is the most critical period for both mothers and newborns. Most maternal and newborn deaths occur during this time. Fact sheet reports that approximately 2.3 million newborns died in the first 28 days of life in 2022, and highlights that about one-third of these deaths occurred on the first day, with nearly three-quarters within the first week underscoring the critical importance of immediate postnatal care (World Health Organization, 2024). In a recent review of maternal deaths, 24.53% were directly attributed to postpartum haemorrhage, underlining its status as the leading direct cause of maternal mortality in Malaysia (Chin, Maluda, Goroh, Lim, Dhanaraj, & Ibrahim, 2023). Highlighted Ministry of health's recommendation of home visits on days 1, 2, 3, 4, 6, 8, 10, 15, and 20 postpartum for mothers without risk factors and a clinic visit on day 30 postpartum. These visits focus on monitoring the mother's physical recovery, mental well-being, and the newborn's development. Integration of traditional practices such as body massages, herbal baths, and dietary restrictions to restore balance and promote healing are also recommended. These practices are often integrated with modern medical care, providing a holistic approach to postnatal recovery (Arifin, Cheyne, Maxwell, & Yousuf, 2021). WHO recommends that all women receive postnatal care within 24 hours of birth, and at least three additional postnatal contacts in the first six weeks to ensure optimal health outcomes. Malaysia's structured postnatal care aligns with these recommendations, particularly in ensuring accessible and affordable services.

Neonatal and Child Health Care Services

1. Essential Newborn Care

Immediate drying, thermal protection, hygienic cord care, and early breastfeeding initiation are lifesaving interventions. Recent studies reaffirm that immediate drying, thermal protection through skin-to-skin contact, hygienic cord care, and early

breastfeeding initiation are simple yet lifesaving interventions capable of preventing the majority of neonatal deaths (Lawn, Blencowe, Oza, You, Lee, Waiswa, & Cousens, 2014; World Health Organization, 2022).

2. Immunisation Programs

Routine immunisation prevents vaccine-preventable diseases contributing to child morbidity and mortality. Recent global reports confirm that routine immunisation prevents vaccine-preventable diseases contributing to child morbidity and mortality, with 3.5 to 5 million deaths averted annually through sustained immunisation programs (World Health Organization 2023; UNICEF, 2023).

3. Nutrition Interventions

Optimal breastfeeding, complementary feeding, and micronutrient supplementation reduce stunting and wasting and improving child survival. Breastfeeding has a significant protective effect against child morbidity and mortality. Optimal breastfeeding could prevent 823,000 child deaths annually. It reduces the risk of infections, stunting, and undernutrition, particularly in low- and middle-income countries (Victora, Barros, França, Bahl, Rollins, Horton, & Walker, 2016). Improving complementary feeding and providing micronutrient supplementation such as vitamin A reduces mortality, prevents growth faltering, and enhances cognitive development (World Health Organization, 2021 & UNICEF, 2021). Complementary feeding and formula intake among 119 infants (6-24 months) in urban daycare settings and found that, complementary foods provided ~57% of energy intake, milk formulas another ~56%, protein intake was excessive (>130% of RNI), while intakes of vitamin A, iron, zinc, fats, and essential fatty acids were below recommended levels. This result indicated a mismatch—adequate energy/protein but insufficient micronutrients—underscoring the need for improved feeding guidance and fortified foods (Khor, Saravanan, Holland, Lee, Ryerson, McDonald, & Goh, 2021). In Malaysia, a randomized pilot trial study conducted by in a low-cost flat community in Selangor where children aged under 5 received micronutrient packets daily for 4 months, found that, there is a significant improvement in haematological measures (e.g., serum ferritin & mean

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Management and Science, University Shah Alam Malaysia
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corpuscular volume), though no significant gains in anthropometry during the short follow-up, implies that, enhancing iron stores is feasible through community-based micronutrient programs; although larger-scale studies are warranted. Malaysia's National Plan of Action for Nutrition Malaysia III (2016–2025) highlights “Promoting Maternal, Infant and Young Child Nutrition” and includes strategies to reduce micronutrient deficiencies (Wang, Jalal, Song, Teo, Tan, Heng, & Lum, 2022).

Strategies to Reduce Maternal, Neonatal, and Child Morbidity and Mortality

1. Strengthening Health Systems – ensuring adequate workforce

Health system capability, especially around childbirth care, is critical for maternal and neonatal survival. Inadequate staffing, lack of essential supplies, and poor facility readiness are linked to higher maternal and neonatal mortality rates in low-income countries. Availability of skilled workforce, functional equipment, and essential medicines are necessary to provide quality intrapartum and emergency obstetric care (Campbell et al. 2023). Investments in health workforce, infrastructure, essential supplies, and emergency care readiness are critical to end preventable maternal and newborn deaths by 2030 (World Health Organization, 2023).

2. Community-based Interventions training community health workers for home visits and health promotion.

Community health workers play a critical role in improving maternal and newborn health outcomes. CHW-led home visits, health promotion, and referrals significantly reduced neonatal mortality by up to 24% and improved maternal health indicators in low- and middle-income countries. Home-based newborn care, danger sign recognition, and antenatal/postnatal counselling were key intervention components (Tiruneh, Shiferaw, & Worku, 2019).

3. Health Education and Empowerment – enhancing women's knowledge on danger signs and health seeking behaviour.

Health education interventions significantly improved pregnant women's knowledge of danger

signs, birth preparedness, and complication readiness. Women receiving structured education were more likely to attend antenatal care, deliver in health facilities, and seek timely care for complications (Singh, Pallikadavath, Ogollah, & Stones, 2012).

4. Policy and Financing – increased investment in MCH programs and universal health coverage implementation.

Policy prioritisation increased domestic and international investment in maternal and newborn health, and progress towards UHC are essential to end preventable maternal and child deaths by 2030. Countries with strong political commitment and financing for MCH have seen significant reductions in mortality rates (World Health Organization, 2023).

5. Data-driven Decision Making - using health information systems for monitoring and targeted interventions.

Implementing electronic health information systems in MCH programs improved data quality, service coverage tracking, and decision-making, resulting in better maternal and neonatal health outcomes (World Health Organization, 2007). WHO reports reaffirm that strong health information systems enable effective monitoring, planning, and targeted interventions, leading to improved maternal and child health program performance (World Health Organization, 2022).

DISCUSSION

This review highlights the importance of integrated maternal and child health services in preventing complications and reducing mortality. Despite proven interventions, implementation barriers persist, including health workforce shortages, limited infrastructure, and socio-cultural factors affecting service uptake. Estimates a global shortage of 900,000 midwives, especially in low- and middle-income countries (LMICs), limiting skilled care coverage, leading to overburdened staff and reduced quality of care (Campbell & Koca, 2021). Poor transport, inadequate referral systems, and lack of equipment prevent effective service delivery (Kruk, Gage, Arsenault, Jordan, Leslie, Roder-DeWan, & Pate, 2018). with rural areas facing greater deficits,

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Management and Science, University Shah Alam Malaysia
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leading to geographic inequities in MCH services (Kruk, Gage, Arsenault, Jordan, Leslie, Roder-DeWan, & Pate, 2018). Furthermore, Gender norms, maternal education, beliefs, and lack of autonomy affect service uptake, for example, traditional beliefs about childbirth influence health-seeking behaviour in Southeast Asia (Yadav, Sahni, & Jena, 2021).

In Malaysia, integrated MCH services have contributed to significant reductions in maternal and child mortality (Ministry of Health Malaysia, 2019). However, Indigenous and rural communities continue to face barriers due to distance, socio-cultural norms, and language differences (Gizaw, Astale, & Kassie, 2022). and Health workforce distribution remains unequal between urban and remote settings (Cheah et al., 2021). Community-based interventions are critical in bridging health system gaps. Community Health Workers interventions improve ANC and immunisation coverage in LMICs (Perry, Zulliger, & Rogers, 2014). In Malaysia, initiatives such as KOSPEN (Komuniti Sihat Pembina Negara) focus on health education and lifestyle modification at the community level, but similar targeted maternal-child health models require expansion (Ministry of Health Malaysia, 2019). Digital platforms, such as mHealth tools for pregnancy education, improve ANC attendance and skilled birth delivery rates and improve maternal health knowledge, adherence to ANC, and vaccination rates (Sondaal, Browne, Amoakoh-Coleman, Borgstein, Miltenburg, Verwijs, & Klipstein-Grobusch, 2016). However, implementation challenges include digital literacy, infrastructure costs, and data security (World Health Organization, 2021). Community empowerment strategies such as participatory approaches engaging communities in planning, monitoring, and implementing health programs, which increase sustainability and ownership is vital (Howard-Grabman, Miltenburg, Marston, & Portela, 2017).

CONCLUSION

Prevention of maternal, neonatal, and child complications and reduction of morbidity and mortality require comprehensive and integrated health care services across the continuum of care. Strategic investments in quality antenatal, intrapartum, postnatal, and child health services are crucial to address preventable causes of deaths. Additionally,

active community participation, including health education, empowerment, and community health worker engagement, enhances uptake of services and timely care-seeking behaviours. Strengthening health systems, workforce capacity, supply chains, and emergency care readiness, alongside robust policy frameworks and adequate financing, is imperative. These integrated approaches are essential to achieve Sustainable Development Goals (SDGs) targets 3.1 and 3.2 by 2030, ensuring healthier futures for women and children globally.

SUGGESTION

Implementing frequent CHW home visits is vital in the Prevention of Complications, Reduction of Maternal, Neonatal and Child Morbidity and Mortality Rate. Aim for multiple visits during both antenatal and postnatal periods, as the strongest neonatal mortality reduction (24%) occurred in studies with ≥ 3 visits and integrated antenatal plus postnatal care, Package interventions into comprehensive home-based care. Implementing frequent CHW home visits is vital in the Prevention of Complications, Reduction of Maternal, Neonatal and Child Morbidity and Mortality Rate. Aim for multiple visits during both antenatal and postnatal periods, as the strongest neonatal mortality reduction (24%) occurred in studies with ≥ 3 visits and integrated antenatal plus postnatal care, Package interventions into comprehensive home-based care. Further research is needed to evaluate digital health interventions and community empowerment strategies to address health inequities.

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