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Maternal and Infant Mortality: A review of determinants, trends and health care services utilization

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ABSTRACT

Maternal and infant mortality rates have decreased worldwide in recent decades, but some underdeveloped regions continue to struggle because of superstitions, erroneous beliefs, and restricted access to high-quality healthcare. The main factors influencing maternal and newborn mortality, new trends, and the usage of medical services are the main topics of this narrative review. In order to further minimize avoidable deaths among women and newborns, the report highlights the significance of community knowledge, equitable access to healthcare facilities, and enhanced health systems.

Key words: MMR, IMR, Determinants, Trends, Healthcare Access.

Objective: To examine the body of research on the causes and patterns of IMR and MMR.

INTRODUCTION

A nation's socioeconomic growth, healthcare quality, and equity in access to healthcare services are all significantly impacted by maternal and newborn health. Neonatal survival and long-term child outcomes are directly impacted by the mother's health before to, throughout, and after pregnancy. Maternal and newborn mortality continue to be significant public health issues despite international efforts and improvements in health infrastructure, especially in low- and middle-income nations. Health hazards are nonetheless made worse by elements like poverty, a lack of access to trained birth attendants, low levels of female education, hunger, and cultural obstacles. Achieving the Sustainable Development Goals pertaining to health and well-being still depends on bolstering maternal

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and child health initiatives, particularly in underprivileged communities.

The quality and accessibility of obstetric and reproductive healthcare services are reflected in the maternal mortality rate (MMR), which is calculated as the number of maternal deaths per 100,000 live births. Preventable problems like bleeding, hypertension, infections, and unsafe abortions are frequently the cause of high maternal mortality. Improving prenatal care, emergency obstetric services, and institutional deliveries dramatically lowers MMR, according to research. However, due to unequal healthcare infrastructure and budgetary constraints, there are still differences in the performance of the health systems in urban and rural areas. In order to sustainably reduce maternal fatalities and advance gender equality in health outcomes, policy programs that prioritize maternal health education, skilled attendance at birth, and postpartum care are crucial.

A sensitive indicator of a country's general health is the infant mortality rate (IMR), which is calculated as the number of newborn deaths under one year per 1,000 live births. IMR is closely related to postpartum care, nutrition, birth circumstances, and maternal health. Inadequate breastfeeding techniques, premature birth problems, and neonatal infections are the main causes of infant mortality. Although IMR has significantly decreased internationally as a result of improvements in maternal healthcare utilization, vaccine coverage, and newborn intensive care services, disparities still exist within socioeconomic groups. Maternal and infant mortality rates can be further decreased by strengthening the continuum of care from pregnancy to early childhood through integrated health programs.

Souza, JP., et al. (2024) in their studies the various factors that affect maternal health and mortality in their study, highlighting the fact that social and economic disparities are just as much of a factor in mother deaths as medical conditions. It emphasizes how better health systems and more widespread societal change can lead to a shift from high to low maternal mortality. The study emphasizes how critical it is to address social determinants and provide access to high-quality healthcare. To guarantee maternal well-being and lower avoidable mortality, comprehensive, multisectoral initiatives are required.1

Yuya, M., et al. (2024) in their study found important variables associated with maternal death in women experiencing serious obstetric difficulties. The chance of dying was greatly enhanced by pre-existing medical disorders, cesarean delivery, postpartum hemorrhage, and ICU admission. Uterine rupture and bleeding continue to be the main causes of maternal fatalities despite the availability of prophylactic interventions.

The study highlights the necessity of more robust interventions, including blood banks, safe cesarean procedures, and thorough PPH care.2

Tajvar, M., et al. (2022) in their study thorough reviews and examined data from throughout the world on the ecological and individual factors that influence maternal mortality at all income levels. The majority of the determinants were associated with low- and lower-middle-income countries, according to 121 studies from 33 countries. Maternal education, access to healthcare, sanitation, and socioeconomic position were important variables. The study found that the causes and trends of maternal mortality around the world are significantly influenced by income level.[3]

Hamal, M., et al. (2020) in their study completed a review that identifies structural and intermediate factors impacting maternal mortality and health service utilization in India by integrating quantitative and qualitative evidence using a thorough approach. According to the study, maternal health outcomes in India are significantly influenced by structural factors such as economic class, caste, education, gender, religion, and culture. Service use and mortality are also influenced by intermediary factors such domicile, maternal age, parity, and media exposure. Maternal outcomes and access to care are determined by these intermediary factors, which are influenced by structural factors. Social power disparities result in unequal access for underprivileged women, and the health system itself plays an important autonomous role.[4]

Bakshi, R. K., et al. (2025) in their study examined nationwide patterns revealing a dramatic drop in India's maternal death rate from 1,287 per 100,000 live births in 1957 to 97 in 2023. Better socioeconomic circumstances, healthcare facilities, and government initiatives like Janani Shuraksha Yojna (JSY) and Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) are all associated with this change. The drop has been mostly attributed to increased use of prenatal, institutional, and postnatal care. However, geographical differences and avoidable causes like bleeding and infection continue to be obstacles to reaching the 2030 Sustainable Development Goals target.[5]

Mukherjee, A., et al. (2019) in their study in order to determine the distal determinants of infant mortality, they examined state-level data

from rural India. Lower infant mortality rates were linked to higher levels of female employment, literacy, and per capita income. The greatest and most significant negative connection between IMR and any component was seen in female literacy. The results show that education for rural women is the primary factor contributing to long-term declines in infant mortality.[6]

Mohamed, H. A., at al. (2022) in their study discovered that preterm, low birth weight, and birth asphyxia were the primary causes of the high neonatal mortality rate of 186 per 1,000 live births. Lack of prenatal treatment, neonatal sepsis, preterm delivery, birth asphyxia, and low birth weight were important predictors. With prompt care and better maternal health services, many of these problems can be avoided. In order to lower mortality rates, the study recommends more robust interventions for the early identification and treatment of newborn problems.[7]

Patel, K. K., & Kumar, M. (2021) in their study maternal education, birth interval, age at birth, and access to prenatal care were identified as the main variables. In order to reduce neonatal fatalities, the study highlights focused measures that emphasize maternal education, poverty reduction, and better access to healthcare.[8]

Chauhan, B. G., et al. (2022) according to their research, comprehensive prenatal and postnatal care considerably lowers both early and total infant mortality. After taking socioeconomic and demographic aspects into consideration, safe delivery by itself did not demonstrate a meaningful influence. The results underscore the necessity of enhancing mother and child health services' affordability, accessibility, and public awareness. To further lower infant mortality, the continuum of care from pregnancy to the postnatal period must be strengthened.[9]

Adem, A., et al. (2021) in their study found the preterm birth, low birth weight, newborn infections, delayed breastfeeding, and referrals from other hospitals were identified to be the main variables associated with neonatal mortality. The risk of death was more than five times higher for newborns who were not nursed within the first hour. To stop these mostly preventable deaths, it suggests improving maternal care, NICU services, and referral networks.[10]

Zaman, B., et al. (2024) according to their research, pregnancy-related

problems and IUCD complications were the primary causes of the greatest MMR patterns in mother and newborn mortality. MMR includes intrauterine contraceptive device (IUCD) difficulties, insufficient ANC, premature labor, and nutritional deficits, while IMR is associated with pregnancy complications, hypertension, and poor hemoglobin.[11]

Jelly, P., et al. (2023)) according to their research, there are a number of customs associated with pregnancy and the postpartum period, such as avoiding yellow fruits, consuming less food, adhering to social norms following childbirth, and depriving the baby of colostrum. Despite this, most mothers adhere to healthy habits that are good for both the mother and the child. The writers place a strong emphasis on encouraging beneficial behaviors while discouraging detrimental ones. To improve maternity and newborn health outcomes, moms and families should be motivated and educated.[12]

Methodology:

Databases including PubMed, Scopus, and WHO reports were used to find pertinent research from 2015 to 2025, including both quantitative and qualitative studies.

Conclusion:

The combined data from the examined research highlights the complex interactions between medical, social, economic, and systemic factors that influence maternal and newborn mortality. The impact of social determinants, such as maternal education, socioeconomic status, gender, caste, cultural practices, and access to health services, is equally important in determining maternal and infant outcomes, even though medical complications like prematurity, low birth weight, postpartum hemorrhage, birth asphyxia, and cesarean-related issues continue to be major contributors. Higher female literacy, better household income, and maternal empowerment are all consistently linked to reduced rates of mother and newborn mortality, according to several studies, underscoring the crucial role that education plays in attaining long-term health gains.

The maternal death ratio in India decreased from 1,287 per 100,000 live births in 1957 to 97 in 2023, indicating significant declines in maternal mortality across decades. Stronger health infrastructure, greater use of prenatal, institutional, and postnatal care, and the execution of government programs like the Janani Shuraksha Yojana (JSY) and Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) are all credited with these advancements. However, geographical differences still exist, and avoidable causes of maternal and newborn deaths—such as bleeding, infection, and

poor care during complications—remain significant obstacles.

Maternal mortality is disproportionately greater in low- and lower-middle-income nations worldwide, according to studies, and patterns of death are shaped by ecological and income-related factors. Economic class, caste, gender inequality, and cultural norms are examples of structural factors that have a significant impact on health outcomes and access to care. These factors frequently interact with intermediary factors like maternal age, parity, place of residence, and media exposure. The data highlights the need for comprehensive strategies that address socioeconomic injustices, empower women, and increase health literacy in order to reduce maternal and newborn mortality.

Preventable deaths are also caused by detrimental customs throughout pregnancy and the postpartum period, delayed breastfeeding initiation, and a lack of knowledge about critical maternal and newborn care. Maternal and baby health outcomes can be greatly improved by encouraging positive behaviors while discouraging negative ones, as well as by educating and motivating the community. In order to handle obstetric problems and neonatal emergencies, studies also emphasize the significance of safe delivery procedures, blood bank accessibility, NICU services, and prompt interventions.

In conclusion, multisectoral, integrated initiatives combining high-quality healthcare, social empowerment, education, and policy-driven structural reforms are necessary to reduce maternal and newborn mortality. Achieving sustainable reductions in avoidable fatalities requires strengthening health systems, guaranteeing fair access to mother and child health services, addressing social determinants, and raising community awareness. mother and newborn well-being and the long-term objective of equitable, safe, and high-quality mother and child health can only be achieved via all-encompassing and inclusive initiatives.

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