

CHAPTER 2

REVIEW OF LITERATURE

2.1 Factors affecting IMR and NMR in India

The number of children who died under the age of five declined from 9.88 million (2000) to 6.28 million (2013). In children aged between 1 to 59 months, neonatal mortality rate dropped at a rate of 2-9% per year in 2013 as compared to 4-9% in 2000. This relatively minute decline of NMR has led to the worldwide failure to achieve Millennium Development Goal 4. One of the major causes of infant morbidity and mortality is serious bacterial infection (i.e., sepsis, pneumonia, and meningitis) in neonates.³⁴ The common factors that correspond to inadequate use of neonatal care facilities include poor identification of disease, socio-cultural beliefs of neonatal isolation, traveling time to the health facility, less quality care, lack of funds for getting health care etc. People prefer to seek care from non-government organizations, however most of them cannot afford. The Janani Shishu Suraksha Karyakram was established with an aim to break the barriers in terms of technical and financial constraints.³⁵

Mortality among newborns: The limitations

About one-fifth of all live births and a quarter or more of all newborn deaths worldwide are from India. In 2013, about 0.75 million deaths of newborns occurred in India, the greatest number ever reported from any area of the globe.³⁶ The present NMR is 28 for every 1000 live births. The aim of lowering the death rate of children below

five years to 20 or less per 1000 live births by 2035 may be difficult to achieve if requisite measures are not taken up timely.

The long-term burden of neonatal mortality

The number of newborn and infant deaths has decreased considerably during the last two decades. The number of newborn fatality was reduced from 1.35 million in 1990 to 0.75 million in 2013.³⁶ Neonatal and infant deaths have dropped in recent years; particularly newborn fatality was declined by 33% between 2000 and 2013, compared to 17% between 1990 and 2000.

Trends and forecasts in neonatal mortality

The NMR was 44 per 1000 live births in 2000 versus 28 per 1000 live births in 2013. The pace of decrease, however, has trailed below the targeted newborn mortality. The average annual reduction rate (AARR) of neonatal mortality was slightly lower (3.5%) as compared to the declining infant mortality rate (IMR) (4.0%). The reason for this disparity is the greater AARR of post-neonatal infant fatalities, i.e., infant deaths (1-12 months), as compared to newborn deaths. The predicted NMRs for 2017 and 2020, based on the AARR were 24 and 22 per 1000 live births, respectively. The NMR rates were anticipated to reach 20/1000 in 2017 and 18/1000 in 2020. The AARR for NMR was zero during pre-NRHM period (2003-2005) and it grew by 2.8% per year during NRHM period (2006-2008). Between 2009 and 2011, when the program was completely implemented, it was increased to 4.6% every year. Further reduction of NMR is expected in the coming years.⁸

Causes of Neonatal Mortality

In 2013, assessment of the causes of global neonatal mortality led to the identification of two major causes of high NMR in India (a) preterm delivery and (b) infections. Liu et al. (2012) revealed asphyxia at birth and anomalies to be the leading causes of newborn deaths other than preterm.³⁶⁻³⁷ Around three-quarters of newborn deaths occurred in the first few days (the first week after birth). Amongst, one-third of neonatal death occurs within 24h.³⁸⁻³⁹ Baqui et al. (2006) elaborated on the causes of death of neonates at several instances – the majority of neonatal deaths (97.8%) occurred during the first week due to asphyxia, amongst three-fourths of deaths were due to prematurity and congenital malformation. About 70% of them died within 24h due to sepsis while 30% died in the second week due to other infections. Neonatal morbidity is a substantial burden on the healthcare system and the community at large. Bang et al. (2005) performed an extensive study on the effects of common diseases on newborns in rural areas of India. Respiratory tract infections, diarrhea, pneumonia, etc. were observed to be the major causes of morbidity in newborns.^{38, 40}

LBW and preterm birth

LBW babies had an 11-13 times greater likelihood of dying than NBW babies.⁴¹ In fact, neonatal deaths are five times more common in LBW/preterm babies.⁴²⁻⁴³ About 30% of newborns in India have been reported to be born LBW (<2500 g) that accounts for about 42% of the global report. Amongst 40% of them were born preterm.⁴⁴ Besides, 3.5 million newborns are reported preterm every year in India. LBW babies are likely to die more than 10 times as compared to normally born babies.^{41,44}

Sepsis in newborns

In India, the prevalence of newborn sepsis is extremely high. According to hospital-based studies, the frequency is 30 per 1000 live births, while community studies showed the prevalence up to 17% of all live births.^{41,45} About one-fifth of newborns' death due to sepsis happened in the hospital; 50% of them have been related to cultural practices-related sepsis. Moreover, prolong hospitalization of babies may affect neurodevelopmental processes and affect their growth and development.⁸

Perinatal asphyxia

Intrapartum or perinatal asphyxia-related diseases may result in neonatal fatalities leading to stillbirths. The incidence has been estimated to range from 2-16.2% and the mortality rate from 38.5-74% based on community-based studies. A comprehensive hospital-based study reported that about 2.8-5.6% of all newborns experienced moderate to serious asphyxia, with a mortality rate of about 8.7%.⁴⁶

2.2 Mixed method design

A study conducted on ASHAs in rural areas of India by Sarin et al., (2016) reported that family members, healthcare system, and socio-cultural conditions cause a remarkable impact on the role of ASHA in the region. The study further reported that the source of income being a motivating factor for ASHA, low incentive of their job also caused distress in the family.⁴⁷ Another study, based on focus group discussion of ASHA in remote areas of Orissa observed no correlation between motivation and dissatisfaction with the incentives. Lacking in the healthcare system and inappropriate

tasks allotted to ASHA often demotivated them. While, stakeholder participation and gender mainstreaming were affirmative factors towards the functioning of ASHA.⁴⁸

A study by Prabhughate et al., (2018) highlighted challenges faced by community health workers in order to modify the behaviours of individuals and also while changing the harmful local practices of maternal and newborn care. ASHAs faced most critical challenges while managing and facilitating a safe delivery.⁶⁸ Another study reported inappropriate monetary incentives and poor functionality of healthcare system to be important factors that affect proper functioning of ASHA in the community.¹⁹

2.3 Newborn care practices at home and in community

Infant care practices of mothers such as cord care, early breastfeeding, and maintenance of body temperature were evaluated. Only a few mothers practiced all the newborn care activities listed. Hygienic cord care was practiced by only one-fourth of mothers. The common materials applied to the cord were ghee, ash, and talcum powder. The use of gentian violet on the umbilical cord was recorded as well. It was higher among those with at least one ANC examination than those without ANC examinations. Its use was higher among those who delivered at home than those who gave birth in a hospital.⁴⁹ There was a lack of documentation for everything related to proper care of eyes, umbilical cord stump, and newborn issues for which adequate management is needed. There was insufficient guidance about the high-risk status of the infant. Established neonatal services other than immunization were insufficient and, in particular, physical examination and counselling services need to be reinforced.⁵⁰

Many dangerous and unwanted neonatal care activities were practiced as a part of their culture, such as home deliveries performed by untrained birth attendants, repeated use of turmeric powder with oil or ghee on the umbilical stump, bathing the baby immediately after birth, initiating breastfeeding after 24 hours, and not giving colostrums to their baby. The prohibitions from the elderly family members due to family traditions were the key reason. The immunization status of the babies was low. The awareness of the mothers was low and their newborn care practices were unsafe. This should be improved by proper coverage with established health services.⁵¹

The most prevalent practice of childbirth was home delivery in Bangladesh. The majority of women understood how to dry the baby, swaddle the baby after birth, and care for the cord. To cut the cord, sterilized instruments were used. Shortly after birth, some of the harmful practices were noticed such as early bathing, applying substances to the umbilical cord, not practicing exclusive breastfeeding, and providing prelacteal feeds such as water, honey, and other foods.⁵²

Another study reported home deliveries carried out by local dais and relatives. Bathing the baby soon after birth was a common procedure in-home delivery. In most of the home deliveries, fingers were used to clean the air passage, and newborns were not weighed at birth. In most of the cases, rooming-in was provided. Injection tetanus toxoid was administered by unqualified practitioners to some of the neonates. The use of a sterile cord tie such as clip, bands, or thread to tie the cord, no application to the cord, and breast milk as the first feed were significantly higher in-hospital deliveries. It is critical to reorient health care providers and train mothers on safe delivery practices and early neonatal care.⁵³

Focus group discussions in a rural maternity hospital with new mothers and their caregivers, and in-depth interviews with health professionals at the community level revealed the termination of the practice of colostrum withholding and the barbaric branding practices. However, recurring unhealthy cultural values and behaviours have been discovered, such as withholding hot or cold nutritious foods, inadequate movement after delivery, isolating husband and wife for a year or more after birth, applying different substances to the newborn's umbilical stump and eyes, and providing prelacteal feeds. Community-level health workers should target antenatal and postpartum women, their caretakers, and elders for counselling and behaviour modification.⁵⁴

Cord care

Sinha et al., (2013) reported the use of non-sterile thread to secure the cord by trained birth attendants and instructed mothers to apply several coats to the cord stumps of the newborns.⁵⁵ Only a few mothers practiced breastfeeding within an hour and a very limited number of babies were breastfed exclusively for six months. Most of them were given prelacteal feeds and colostrum. This demonstrates that undesirable cultural and traditional practices were still prevalent in the population, such as giving prelacteals and late initiation of breastfeeding. Mothers need active support, care and privacy for good feeding, not only from their families and communities but also from the entire healthcare support system.⁵⁶ Approximately half of the deliveries took place at home and the baby was bathed with warm water and dried with clean cloth by most mothers. Within one hour of birth, only some mothers started breastfeeding. Most of the mothers did not feed colostrum to their babies because of traditions. Correct awareness and correct practices about newborn care have been lacking among mothers in most

cases. This should be promoted by increasing coverage with the available health services.⁵⁷

2.4 ASHA knowledge and practices of HBNC

Stalin et al. (2011) highlighted that knowledge of ASHA did not increase immediately after training. This may be due to prolonged accumulation of pre-training knowledge of HBNC over the years or shortage of regular training. Three months after practices, there was a significant increase in ASHA's awareness. This could be due to learning by doing; it shows that ASHA need regular practical trainings.⁵⁸ ASHAs' knowledge and expertise in neonatal care are inadequate primarily postnatal care such as diagnosis of ill newborns, breastfeeding support and KMC. Significant variability was found in ASHA workers' self-reported and field practice results.⁵⁹

2.5 Effects of HBNC on the health of newborns

At the end of three years of home-based newborn care (HBNC) intervention, Bang et al., (1999) from Gadchiroli in Maharashtra, India, showed substantial reductions in NMR. The training was conducted on village health workers by doctors in essential neonatal care practices, including resuscitation and danger sign recognition. They were competent to give injections of antibiotics (gentamicin) and oral cotrimoxazole to newborn babies. They made 8-12 postnatal visits to assess the weight, temperature, and complications or illnesses of the newborn babies. Home-based neonatal care, including sepsis control in the population, was approximately 50% appropriate, reliable, and also reduced neonatal and infant mortality.⁶⁰

Bhutta et al., (2005) listed 16 potential low cost therapies that could minimize neonatal mortality. The 90% coverage of intrapartum and postnatal packages had similar impacts, which were two to three times greater than those of prenatal care alone. Their research also showed 90% coverage of all settings-outreach and home-based newborn care reduced 18-37% of neonatal fatalities. It is vital to emphasize that in situations with high newborn mortality, family and community care have the greatest positive impact.⁶¹

Puri et al., (2008) analyzed home-based newborn care activities in the Chandigarh slum and urban area and reported that 8.4% of home deliveries were carried out by untrained workers and 61.9% by trained workers. The mothers/in-laws/neighbours performed these home deliveries. Within 6-12 hours, the majority of newborns were bathed after birth. The practice of applying kajal (a black substance) was found to be significantly higher in slums than in urban slums. The study also highlighted the prevalence of various unhealthy neonatal care practices such as delay in the initiation of breastfeeding, giving prelacteal feed, etc., which are prevalent especially in the slums.⁶²

Saggurti et al., (2019) evaluated the impact of newborn care intervention on improving newborn health care practices in rural India. The groups that received intervention performed better than the control groups in terms of timely breastfeeding initiation, KMC initiation, and delayed bathing. Awareness about acceptable neonatal procedures through self-help groups improved newborn care practices.⁶³ Johansson et al., (2019) conducted a study on healthy mothers who had normal pregnancy and childbirth, as well as healthy newborns. They were often discharged between six to twelve hours after delivery. A new postnatal midwifery care model was introduced and

provided to the mothers for a certain postnatal period. Postnatal home-based care was popular among the mothers who were discharged early after delivery. Mothers who had a positive outcome in the postnatal care period recommended the same model for application in future.⁶⁴

Evaluation of the efficacy of the HBNC voucher scheme and use of various services related to mother and child health in Assam was conducted. ASHA received vouchers from the mothers when the required visit of the baby was made. ASHA earned the incentives only after submitting six vouchers. After six months of intervention, significant changes were observed in HBNC such as prenatal and postnatal care, the availability of iron-folic acid, and vaccination. HBNC was executed in order to improve knowledge of maternity and child care practices of the health workers and also for the caregivers.⁶⁵ Some studies have shown that neonates and infants with potential sepsis could be detected by field workers. A major proportion of sepsis in neonates (not severe) may be managed carefully with oral antibiotics and gentamicin injection through IM route.^{60, 66}