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Research Article

Breastfeeding Practices and Childhood Nutritional Outcomes in Rural India

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Abstract

Objective: To investigate the factors in relation to childhood nutritional outcomes and breastfeeding practices in rural and urban India.

Methods: The research was conducted through a literary review of various public health interventions and research exclusive to breastfeeding, maternal nutrition, and child nutrition outcomes in India.

Results : There were several factors related to childhood malnutrition and the termination of exclusive breastfeeding in regard to the mothers rural and urban setting.

Conclusion: Childhood malnutrition can be directly linked to the termination of exclusive breastfeeding practices and a shortened duration of breastfeeding. There are several varying factors that impact breastfeeding rates and maternal nutritional including: maternal autonomy, gender of the child, age of the mother, socio-economic status of the mother, and the current lacking Indian healthcare infrastructure. Interventions based on the rural and urban areas will contribute to the reduction of child mortality and increasing exclusive breastfeeding rates.

Keywords: Breastfeeding; Breastfeeding Practices; Infants; India; Nutrition; Children

Introduction

With a population of 1.38 billion in 2020, India is one of the largest countries in the world and continues to grow, which 65,7% of Indian population live in rural areas, according to The World Bank [19]. The increased population necessarily creates a societal demand for better healthcare infrastructure and services – such as access to food, water, and other basic human needs. However, much of India's population continues to struggle. Specifically, childhood mortality rates remain a great concern and are directly correlated with a mother's nutritional status and breastfeeding practices. Maternal malnutrition is correlated with a lack of access to healthy foods, improper hygienic practices, and infectious communicable diseases [12]. There are various factors that influence childhood nutritional outcomes in rural and urban India, but the source of positive childhood nutritional outcomes begins with a proper nutrition and breastfeeding practices by the mother. The nexus between maternal malnutrition and poor breastfeeding practices significantly influences childhood nutritional outcomes.

Health outcomes in rural and urban areas in India

In 2020, the majority of the country is composed of a rural population that accounted for 898 million people, while the urban population accounted for almost 482 million people or 34,6% of the total population [19]. Life expectancy at birth for India is 66.3 years [6]. There are large discrepancies between birth rates, death rates, and infant mortality rates between the rural and urban areas. Figure 1 below describes such discrepancies, with urban areas showing better health outcomes overall.

Scope and limitations of breastfeeding and healthy childhood outcomes

Health outcomes and health care access varies between India's states as there are a limited number of providers to serve the comprehensive needs to all citizens [6]. The rural states suffer the most due to a decreased number of health care workers compared to urban areas. There is a positive correlation between the existence of a large healthcare workforce and the successful implementation of

India Vital Statistics of Rural and Urban in 2016		
	Rural	Urban
Birth rate (per 1,000 population)	22.1	17
Death rate (per 1,000 population)	6.9	5.4
Infant Mortality (per 1,000 live births)	38	23

Table 1: India Vital Statistics: Birth Rate: per 1000 Population: Rural in 2016 [3].

health educational programs. With greater health work force density, there is an increase in the number of vaccinations, successful child deliveries, and infant survival [6]. These health care workers are vital in providing basic health care services to rural populations, who are unable to understand the importance of proper breastfeeding techniques and nutrition.

Despite the significant health inequalities in rural areas, many of these some features are replicated in urban areas. Healthcare access in urban areas is facilitated by the private sector, which is costly compared to the public sector, which mainly caters to the poverty-stricken groups. The public sector's focus on poverty-stricken groups creates a problem for populations living above the poverty line in urban areas. Those populations living just above the poverty line in urban areas are forced to go to privatized care, which is costly and time consuming where most Indian citizens pay costs out of pocket. The increasing population offers another unique set of challenges as the Indian infrastructure continues to grow. The biggest challenge is reducing the miscommunication between current health care services offered and the intended beneficiaries, who are often unaware of the services available to them.

The infrastructure of the Indian Medicine system in 2018 was comprised of 23.582 hospitals, which house 710.761 beds, according to Ministry of Health and Family Welfare [9]. There is a very limited amount of care available to the greater population relative to Indian's total population. There is a large differential between the number of doctors in rural areas and the number of doctors in urban areas, with 0.12 doctors per 1,000 persons in rural areas compared to 1.13 doctors per 1,000 persons in urban areas [6]. Due to the limited number of services available, many citizens are left to take care of their health needs by private providers, which are expansive and vary in care quality. Not only are there low numbers of physicians and medical professionals in rural areas, but also many are unqualified to the job. A staggering 63% of physicians in rural areas have no medical training compared to 20% in urban areas [6]. Untrained physicians can be especially dangerous for expectant mothers or small children, who would be more at risk for infectious illnesses. Medical staff would be unable to treat their patients properly. An increase in educated health care practitioner workforce density can improve health outcomes, with an ideal level of 2 practitioners per 1000 persons, where more education and implementation of basic public health services can take place, thus improving child deliveries and lowering infant mortality [6]. The challenge is great in addressing all of India's rural and urban populations where a limited number of health care workers leads to many patients going untreated, resulting in poor care for soon to be mothers and increased child mortality rates.

Unfortunately, difficulties in accessing health care services have been shown to form significant barriers in initiating breastfeeding within the first hour of birth [15].

How feeding methods affect childhood health outcomes in India

India continues to battle the effects of child malnutrition and high mortality rates. Malnourished children are faced with faltering immunity and stunted growth, which causes damage to their mental and social development [1]. The importance of proper breastfeeding practices cannot be emphasized enough, as it curbs many of the foregoing developmental problems. Breastfeeding protects children from exposure to various health risks, which is especially important where a significant Indian population lacks access to healthcare services. The agents in breast milk positively influence brain biochemistry, which is important for development [1]. Proper breastfeeding practices lead to a child's future success. For example, educational achievement and higher IQ scores were attributed to the increased duration in which children were breastfed, thus showing that small improvements in child nutrition led to an increase in a child's cognitive ability the longer they were breastfed [1].

In addition, the benefit of breastfeeding is that breast milk protects children in environments where the risk of exposure to communicable diseases is high. Aside from a heightened risk of disease exposure, there are other factors that could potentially harm the child. Breast milk serves as the first line of defense to reduce the risk exposure of such harmful environmental pathogens. Therefore, breastfeeding exclusively in a neonate's formative years is extremely valuable because it is one of the simplest health interventions that could take place to positively impact the health of millions of neonates, which results in a healthier population as adults. For example, such practices help reduce the risk of anemia and stunted growth in later years [1]. The positive health outcomes

from breastfeeding cannot be ignored where the benefits to neonates are invaluable. The disparity in health services between rural and urban areas can be remedied in a cost-effective manner by educating both populations on the importance of breastfeeding and the value to a child's development. Educating these populations on the importance of exclusive breastfeeding methods would serve as an efficient health intervention that would help maintain proper child and maternal health outcomes.

WHO recommendations for breastfeeding

The World Health Organization (2015) recommends exclusive breastfeeding (no additional foods or drinks, including water), which is the best means of providing natural food for an infant. Exclusive breastfeeding means that no additional food or drink, including water, should be given to the infant for specified period of time. The World Health Organization [20] and UNICEF [21] came up with recommended guidelines to enable mothers to implement and preserve exclusive breastfeeding for six months. WHO [20] and UNICEF [21] recommend that

- Breastfeeding should be initiated within the first hour of life,
- Breastfeed as much as the infant wants or needs, and no use of bottles, treats or pacifiers.
- When it comes time for a child to wean, WHO recommends that it should be started after 6 months after an infant's birth and breastfeeding should still be continued [20].

In order to maintain optimal population health outcomes and reduce child mortality, exclusive breastfeeding is a necessary practice for mothers, with the foregoing recommendations in mind.

Benefits of breastfeeding for mother and child

Overall, breastfeeding is extremely beneficial for mother and child. Breastfeeding protects infants against infectious and chronic diseases due to its immunologic response and produces a quicker recovery response. Breastfeeding enhances a child's development within the following areas: Gross and fine motor, Language, Vision/hearing and, Personal and social development. Breastfed babies have are significantly advantageous in psychomotor and social capabilities versus those who were bottle-fed. Children who were breastfed in the early weeks of their life from their mother had a higher level in intelligence at age 8 than those who did not receive any breast milk [1]. Not only does the child receive the benefits of breastfeeding the mother does as well. It will reduce the risk of certain cancers for mothers including breast cancer and ovarian cancer. It promotes a sense of bonding between mother and child that promotes sensory and cognitive development.

Determinants of termination of breastfeeding in India

There are differences in exclusive breastfeeding duration among urban and rural areas. There was a higher correlation of breastfeeding in rural areas compared to urban areas. Babies delivered at private healthcare facilities than at home were more likely to terminate breastfeeding earlier. One possible reason for these differences is that private hospitals or institutions may be offering other forms of feeding to infants, including bottle feeding, which may lead to the termination of exclusive breastfeeding [7].

Gender disparities contribute to the differential in health outcomes between infant girls and boys. Boys tend to have greater health outcomes and females tend to breastfeed 0.45 less months than boys and with the shorter duration of breastfeeding for females they had an increased probability of dying before the age of 5. Indian females are breastfed about two weeks shorter than their male counterparts and second born girls were the most at risk [4]. Females would have a lower duration of exclusive breastfeeding and males would have more access to better sources of protein. Also, children under the age of five there are 108.5 female deaths for every 100 male deaths [4]. The earlier termination of breastfeeding in females can be linked to the low female-male ratio in India because of the higher female mortality rate also known as the "missing women" phenomenon [7].

Part of the reason these disparities exist can be attributed to the prevalence and duration of breastfeeding. Although the reason the disparity exists is not entirely clear, some would argue that sex selective abortions, which result in higher male preference through childhood, could potentially be part of the reasoning. The lack of understanding in the importance of breastfeeding practices is attributable to the heightened infant mortality rate in females. An understanding which is also partially due to a cultural norm that serves to hinder child health care outcomes.

Religious affiliation impacts breastfeeding duration practices even when other factors such as socioeconomic status, age, and education are considered. In comparing Muslims, Sikhs, Christians, and Hindus, Sikhs and Christians had the highest level of termination of breastfeeding compared to other groups. Some have argued that specific religious beliefs influence the termination of breastfeeding, but actually religious texts are, in fact, very supportive of the practice of breastfeeding. Reinforcing the hypothesis that cultural factors other than religion affect the duration of breastfeeding of Indian mothers [7].

Malnutrition in adolescent mothers

In light of the health risks infants and children face, there are a number of variables that contribute to the negative health outcomes in adolescent mothers as well. During the adolescent period, many adolescent women are undergoing rapid physical and emotional changes, thus experiencing a pregnancy when the body is not ready can "damaging the reproductive tract, pregnancy-related complications, such as anemia, pregnancy-induced hypertension, preterm labor, maternal mortality, perinatial and neo-natal mortality and, low birth weight" [5]. All of these negative health outcomes can lead to higher risk exposure to infection, leaving adolescent women with fewer options to help them recover from sickness. This problem adds to infant morbidity and malnutrition [5]. Within rural settings, teens (ages 15-19) are more likely to have children than those who live in rural areas. Malhotra., *et al*. 2008, found that there is a higher correlation in the duration of breastfeeding with an increase in the mother's age. This could potentially be due the fact that older mothers are exposed to greater feeding practices.

Women overall in India are limited to certain resources and do not have the same opportunities as men. Even in everyday life all their moves are watched from inside and outside their own homes. There are factors of autonomy and the correlation between exclusive breastfeeding and maternal autonomy within the first 3-5 months of life. The mother's autonomy it is related in dimensions including household decision making, child related decision making, financial autonomy, mobility autonomy, acceptance of domestic violence and experience of domestic violence. Mothers who had higher levels of financial autonomy were more likely to breastfeed their infants as well as mothers who had higher participations in decision making within their own households. Overall, improvements in autonomy for mothers would increase levels of exclusive breastfeeding and the duration [16].

Challenges in breastfeeding

Prelacteal feeding, a tradition in rural Indian culture, is the practice of feeding of neonatal babies before the initiation of breastfeeding. Prelacteal feeds could be honey, milk, water, sugar or sugar water. Delaying the initiation of breastfeeding and promoting other foods can hinder the success of breastfeeding and promote infection. In the rural northern state of Uttar Pradesh this is a commons practice usually is associate with a higher caste, younger age, and those who gave birth at home [14]. Prelacteal feeding can pose a danger to the health of the child with the promotion of infection and other communicable diseases. Practices such as these will take time to change due to their traditions in time, the usage of women' support groups may help reduce this custom and help increase the rates of exclusive breastfeeding. Efforts through community-based strategies should be made, especially within rural areas to discourage prelacteal feeding and encourage exclusive breastfeeding.

In addition, residing in rural areas of the Central region was associated with delayed Early initiation of breastfeeding [15]. Birthing at home, by caesarean delivery or receiving delivery assistance from non-health professionals were associated with decreased likelihood of early initiation of breastfeeding. India's early initiation of breastfeeding prevalence of 41.5% was well below the recommended level of 90% [15].

Childcare in itself to new mothers can be a challenge and many safe practices need to be instilled to help infants survive and thrive. In order to reduce the infant mortality rates, the Home Based Postnatal Newborn program was implemented in 2011. Accredited Social Health Activists (ASHAs), a woman between the ages of 25-45 years would act as channel amid local health systems. ASHAs would conduct six postnatal home visits for newborn care while receiving incentivized income. Mothers were questioned on their safe newborn care practices. These safe newborn practices include: safe breastfeeding, keeping the cord clean, wrapping the baby, kangoroo care, delaying bath and hand washing. From this program that mothers had adopted some safe practices but there was a rift between practices that were adopted and being informed of the practices. Thus, mothers need to be fully aware of safe breastfeeding practices to instill to improve childhood health outcomes [18].

Profile of Indian mothers in rural and urban areas and their current feeding practices

A large percentage of mothers in India live within rural areas and work within agricultural systems. These mothers present a unique challenge, as their children are more likely to exhibit higher rates of under 5 mortality. The rural areas in which they live offer limited access to health care and overall, their socio economic status tends to be lower than compared with urban areas, thus mothers working within the agricultural field are at hindrance to ensure

their child's survival [17]. Although breastfeeding is considered to be a universal practice, mothers working in these rural areas may find it more difficult to engage in exclusive breastfeeding for a number of reasons. Mothers must work hard in the fields and going into labor is a great concern, thus breastfeeding within the first hour of life would prove to be burdensome when they have to. The practice of exclusive breastfeeding would also be difficult to maintain while working in the fields because mothers would be unable to feed the infant. Due to this the new infants are left at home with the infants siblings to be taken care of [17]. These factors contribute to the lower levels of exclusive breastfeeding and the expiration of feeding with rural areas.

In the urban areas, there found to be similar areas as the rural areas. There is a lack of exclusive breastfeeding within urban slums along with a variation of other safe practices [13]. Newly married urban women tend to have great fertility concerns and familial pressure dictates family size [13]. Urban women tend to experience more of the traditional messages of certain 'hot' and 'cold' foods to eat during pregnancy, but exclusive breastfeeding is becoming the norm and delaying breastfeeding or prelacteal feeding seems to be disappearing from this environment [13]. Although there are great differences between the rural and urban setting, one large similarity is that women tend to be second class citizens and do not have much of a say in individual choices.

UNICEF definition of malnutrition

Severe acute malnutrition as defined by UNICEF [21] as "the percentage of children aged 6 to 59 months whose weight for height is below minus three standard deviations from the median of the WHO Child Growth Standards, or by a mid-upper-arm circumference less than 115mm, with or without nutritional oedema." In underprivileged populations, malnutrition can be correlated with poor diet and many communicable diseases, shown below in Figure 2, it explains the basic, underlying, and immediate causes of child and maternal under nutrition. 22% of the disease burden in India is caused by child malnutrition [4]. India's prevalence of child malnutrition is among the highest in the world this produces a catastrophic effect for: economic growth, mortality, and morbidity [1]. Overall, malnutrition and undernutrition can be attributed to unsuitable feeding methodologies; poor care practices and exposure to high levels of infection within the first 2 to 3 years of a child's life [1].

UNICEF Conceptual framework of the determinants of child undernutrition

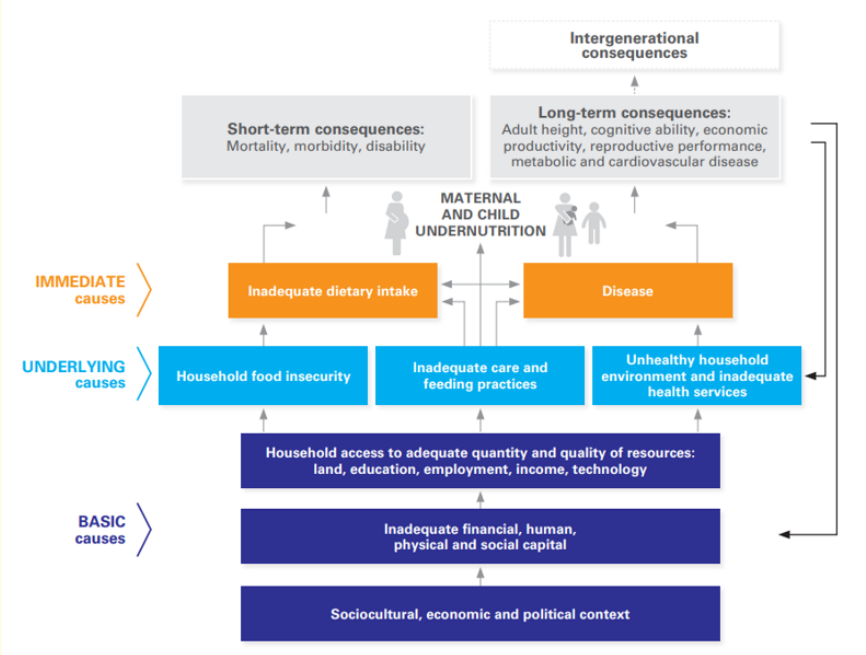

Figure 1: Conceptual framework of the determinants of child undernutrition [21].

Urban and rural childhood population nutritional status

In the rural area TamilNadu, within the village of Kuthambakkam, a study about 172 children ages 3-6 and their mothers analyzed the children nutritional status and what factors are associated with that status. Mothers were interviewed on socioeconomic status, feeding practices of children and children's immunization status. The results showed the prevalence of under nutrition was 66.5%, however, the prevalence of under nutrition among children whose mothers were illiterate was 78.6%. [2] There was a strong association between the extent of exclusive breastfeeding and nutritional status. As socioeconomic status increased as did nutritional status. This study shows the need for health education interventions for parents on the importance of dietary practices and for mothers to learn the importance of exclusive breastfeeding. Improved maternal education is one of the single most important measures to improve not only child nutrition and survival but also maternal health and household social-emotional interaction [11].

Although there is large concern over child and maternal health outcomes in rural areas, the health outcomes with urban areas are becoming concerning as well. Studies of newborn care practices in the slums of Dhaka and Karachi, have found that these were similar to those in rural areas of the South Asia region, including lack of exclusive breastfeeding, bathing the baby soon after birth and applying substances to the umbilical cord [10]. In 2012, India saw a decrease in the median months of breastfeeding continuation in comparison with the early 1990s. In the early 1990s, 50% of Indian women breastfed to 24 months, and in 2012, only 26% breastfeed to 24 months-roughly a 50% decrease in a 20-year period [8].

Recommendations to improve health status and rates of breastfeeding within Indian rural and urban areas

In order to improve the health status of all India's children more doctor, nurses and midwives are needed within rural areas. Increasing the number of medical professionals will increase the health education available for mothers. Overall, consistent policies are needed to ensure physicians are qualified to do their job to reduce the number of physicians without any medical training. An increase in the number of rural interventions and continuing successful programs will help key indicators of childhood health. Providing statewide intervention especially with attention to the rural areas due to poor health outcomes in those states. Interventions will need a focus on breastfeeding within an hour of life and community mobilization to instill a sense of pride in breastfeeding.

Within urban areas in order to effectively help the population cheaper health care would be needed. Indian's living in urban areas pay for most services out the pocket, thus hindering their ability to receive the higher level of care they need. Specific interventions tailored towards community mobilization of mothers in both rural and urban areas will increase rates of exclusive breastfeeding, child mortality and morbidity and mothers' health overall.

Furthermore, efforts to improve breastfeeding in India require a multi-pronged approach and well-coordinated child health programs [11,15]. Not only that infant feeding interventions could improve breastfeeding practices, as well as could make a significant impact in children's health and well-being in the short- and long-term [15] It is urgent that political will and funds be dedicated to these public health actions and the establishment of policies and programs for infant and young child feeding practices are central priorities [11]. Finally, it is very important to provide higher maternal education to families across India, especially in rural areas.

Conclusion

Exclusive breastfeeding, started within an hour of birth, is the most effective intervention for childhood survival and to prevent childhood malnutrition and childhood under nutrition in India. Most importantly, exclusive breastfeeding will reduce child mortality with rural and urban area to produce a healthier population overall. Teenage mothers (15-19 years) also need to be protected, as they are at greater risk of developing complications in childbirth compared to older mothers. Furthermore, actions are needed to reduce the disparity between boys and girls, which has contributed to the "mortality inequality" and explains the low proportion between men and women. There are several varying factors that impact breastfeeding rates and maternal nutrition including: maternal autonomy, gender of child, age of the mother, socio-economic status of the mother, and the current lacking Indian healthcare infrastructure.

The greater the maternal autonomy the greater the chance the child has to be healthy as mothers who feel that they have more freedom of choice, in household decisions and financial decisions,

the more likely they are to exclusively breastfeed. Rural mothers had the tough role of experiencing pregnancy and potentially birth within the agriculture system while urban mothers were more likely to feel familial pressures about their reproductive choices. Specific target interventions within the rural areas for adolescent mothers, female children and women working within agriculture improve childhood health outcomes. While women in the urban areas could receive more community support in decision making in order to improve their maternal and child's health status. Overall, precise interventions in rural areas are needed to target the mother and child, because what mothers need within the rural area is very different than what mothers need in the urban areas.

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