

Healthcare Awareness Improves Infant Health: A Case Study of Bahawalpur, Punjab, Pakistan

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Abstract

The infant mortality rate is considered a key indicator of the state of a community's public health and social development. Developing countries especially Pakistan has the highest infant mortality rate. This case study highlights the impact of healthcare awareness programs to reduce the infant mortality rate in Bahawalpur, Pakistan. The in-depth analysis indicates that healthcare awareness programs change the care-seeking behavior and attitude of the local people toward professional maternal and newborn healthcare. Moreover, knowledge of newborn care, skilled birth attendance and danger signs of illness among rural communities contributes to decreasing the infant mortality rate in Bahawalpur, Pakistan.

Keywords: Infant mortality rate, Health awareness, Professional Healthcare, Community intervention, Care-seeking behavior, Maternal health

Introduction

As per the WHO constitution, the health of children in any country is a shared responsibility. Every country should take it seriously as it affects the well-being of all children living in other countries the same way. Moreover, the infant mortality rate is an important indicator of any country or community's public health and social development. In most countries around the world, diarrhea, pneumonia, malnutrition, low birth weight, short gestation, and respiratory and other infections are the main causes of infant deaths. Mainly preventable diseases are associated with infant deaths. Additionally, determining factors of infant mortality rate are also linked with demographic factors and vary across different groups and communities such as ethnicity, region, race, income status, and education level (WHO 1981).

Globally, lower infant and child mortality are linked with several factors including the promotion of healthcare knowledge/awareness. Researchers have indicated the various demographic and social factors that significantly contribute to the decline in the infant and child mortality rates, such as rural/urban areas, ethnicity, wealth status, and education level. The education level is linked with healthcare awareness because mothers with education have more awareness and knowledge about the importance of healthcare-seeking behavior. They seek regular prenatal, natal, and post-natal care from the health professional, and have knowledge about newborn care, prevention of infectious diseases, nutrition and timely utilization of the healthcare system in case of complications (Pestronk et.al 2003).

In developing countries like Pakistan, there is more need to promote healthcare knowledge as these countries do not have enough doctors or healthcare professionals such as nurses and midwives to serve the people and educate the mothers about necessary measures that need to be taken pre-birth, birth, and post-birth stages for the sake of mother's health and babies' healthy life. The analysis of the demographic health survey 2017-18 showed that mother with a good education level compared to uneducated mothers significantly affects the decline in child mortality rate in Pakistan (Asif et al. 2022).

Unfortunately, Pakistan has the highest infant mortality rate one infant death in 22 live births and Japan has the lowest one death per 1,111 live births in the world. Apart from the provision of healthcare facilities in Pakistan, the infant mortality rate is linked to a lack of proper infant care, and socioeconomic determinants play a significant role in the survival of infants, healthcare knowledge or awareness is one of the crucial factors that can contribute to the decline of the infant mortality rate (Naveed et al.2011).

According to multiple indicator surveys and world bank reports (2014, 2018; 2022), the infant mortality rate at the national level and provincial levels have declined. In Pakistan, it was 64 in 2014 and decreased to 57 in 2018. At the provincial level (Punjab) it was 75 and declined to 60 in 2018. Moreover, the same trend has been observed in Bahawalpur, in 2014 the infant mortality rate was highest at 83 and reduced to 60 in 2018. Through in-depth analysis, this case study will analyze how and what contributes to changes in the infant mortality rate from 2014 to 2018 in Bahawalpur.

Infant mortality rate		
	2014	2018
Pakistan	64	57
Punjab	75	60
Bahawalpur	83	61

Source: Multiple Indicators Survey (MICS) 2017-2018, Bureau of Statistics Punjab, Pakistan and World Bank, 2022

Literature review

Infant Mortality

Infant mortality is higher in developing and low-income countries as they contribute 50% of total child mortality cases worldwide and Pakistan is one of them that has the higher Infant mortality rate along with India and Nigeria (Lozano et al. 2011; Oza et al. 2014).

Ashworth & Waterlow (1982) linked under-five child mortality with the infant period (early months of childbirth) and said 80% of the death happen in the first 6 months of the child's life, this indicates that most attention should be given to the early months of the infant because of greater risk of death at this age. If proper care such as prevention from diarrhea, respiratory infections, malaria, and malnutrition, is not given in the first 6 months it leads to an increase in the infant mortality rate. Moreover, exclusive breastfeeding is a significant component to reduce the infant mortality rate in developing countries (Woodbury 1922).

India focused on the post-neonatal period (the time between the first month and first year of an infant) and maternal health to control the infant mortality rate as it is a very sensitive time in the infant's life which required intense care such as immunization coverage and diarrhea and maternal health also affects infant's health as babies of mothers who take iron and folic acid with other nutritious food items do not suffer from malnutrition, low birth weight and develop a strong immunity to deal with infectious diseases which leads to reduce the probability of dying before the first birthday or year of age (Anand et al. 2000).

Health Awareness

Khan (2019) conducted a study to observe the socioeconomic determinants of infant mortality in Pakistan and the study results highlighted lack of education and healthcare awareness are among the leading causes of infant mortality rate along with cultural beliefs and healthcare coverage.

A study in Pakistan revealed that mothers or families who do not know the danger signs and complications of pregnancy are unable to utilize timely professional healthcare and seek traditional birth

attendance which has higher risks due to a lack of skilled birth knowledge and care facilities. Most of the time families are not prepared for the delivery such as transportation arrangements and baby bags with necessary items required at the time of delivery. So, birth preparedness and knowledge of danger signs are significant components of seeking on-time professional healthcare and need to be promoted among families at the local level to reduce the number of traditional birth attendance (Safdar et al. 2002).

A study on the determinants of infant mortality rate in Ethiopia showed the strong link between mothers' education and infant survival and explained education is an element of awareness as educated mothers have more knowledge about the importance of timely and skilled healthcare, immunization and seeking professionally advised newborn care compared to traditional health practices. They seek professional maternal care through all critical stages antenatal, natal and postnatal, and skilled birth attendance. They know the critical time during pregnancy, delivery and post-delivery and the importance of timely access to the professional existing healthcare system. Education modifies the mother's behavior and attitude to refuse normative and traditional healthcare methods and motivates them to aware of preventable diseases and adopt preventive practices for infant survival (Vikram et al. 2010; Aslam 2012; Bicego 1993; Ikeako et al. 2006).

Antenatal/Prenatal Care

At the beginning of the 1990s, Pakistan had a high infant mortality rate of around 86 deaths in 1,000 live births now it is decreased to 54 but it is still high. The analysis of the demographic health survey indicates the leading factors such as not attending antenatal care, living in rural areas and unskilled birth attendance are significantly linked with the increased infant mortality rate in Pakistan. Additionally, mothers who had non-skilled birth attendance experienced a high risk of infant mortality rate. The study results suggested initiating healthcare awareness programs among families at the local level, especially in rural areas to promote knowledge about the utilization of antenatal care, post-natal care and skilled birth attendance (Patel et al. 2021).

Skilled Birth Attendance

According to the World Health Organization (2014), good healthcare which includes antenatal, postnatal care and skilled birth attendance can reduce 3-4 infant deaths. Moreover, research studies also indicate that mother's/family members' knowledge about delivery at a health care facility or with the presence of

skilled health professionals/ staff is proven to be a good indicator to reduce the neonatal mortality rate. As non-skilled birth attendance increased the high risk of neonatal mortality rate(Lau et al. 2013; Målqvist et al. 2008; Ahmed et al. 2001; Zanconato et al. 2006).

Newborn care

Research proved that neonatal (first 28 days of life) and post-neonatal (death probability from 28 days to first 11 months of the infant) mortality both contributes to the infant mortality rate, so newborn care from birth till the first year of life is very important. These two stages are linked in different ways as neonatal mortality is more associated with care during pregnancy and infant mortality is mostly linked with post-neonatal care (delivery and after the delivery period) but both require essential care of newborns and mothers. In developing countries, neonatal deaths contribute to around 60% of infant mortality, meaning the first 28 days are critical for infant life and need crucial healthcare knowledge and healthcare-seeking behavior for the survival of infants. The survey was conducted to observe the determinants of infant, post-neonatal and neonatal mortality in rural areas of Pakistan. The survey results reported Diarrhea, tetanus (maternal immunization part of antenatal care), and respiratory infection as three major reasons for neonatal, post-neonatal and infant mortality. Moreover, complications during pregnancy and delivery are the important cause of neonatal deaths and infectious diseases such as diarrhea and acute respiratory and cord care (a key element of neonatal care) accounted mainly for the post-neonatal and infant mortality rate. The study recommended the need for social mobilization and promotion of healthcare-seeking behavior such as antenatal and postnatal visits, skilled birth attendance, newborn care, immunization and give preventive healthcare knowledge among women at the local level such as prevention of infectious diseases like diarrhea (Fikree et al. 2002).

Methods

The purpose of this research study is to observe the impact of healthcare awareness to reduce the infant mortality rate in Bahawalpur. Therefore, the research holds the statement “A higher level of healthcare awareness leads to a decrease in infant mortality rate”. The independent variable is healthcare awareness, and the dependent variable is the infant mortality rate. The various indicators such as neonatal and postnatal care, Immunization, feeding practices, protection from pneumonia and skin-to-skin contact, danger signs, diarrhea, and prevention of malaria & dengue are used to measure the independent variable; healthcare awareness (WHO 2022; UNICEF 2019). Moreover, determinants of infant mortality rate; dependent variable and concept definition are assessed through UNICEF (2019). A qualitative, small-n case study method is used to assess the role of healthcare awareness on the infant mortality rate in

Bahawalpur, Pakistan. The cases include one City from Bahawalpur division Punjab, Pakistan as this city has the highest infant and child mortality rate. It will include the within-case analysis from 2014-2018. The unit of analysis is City. This is a typical case study. This case study will assess the relationship between healthcare awareness and infant mortality rate through in-depth analysis. It will examine how and why healthcare awareness contributes to decreasing the infant mortality rate.

Infant Mortality Rate

According to UNICEF (2019), The infant mortality rate is defined as the expected death rate between birth and the first year of infant/child indicated as the number of infant deaths per 1,000 live births.

Preterm birth, diarrhea, respiratory infection, low birth weight, complications during pregnancy, neonatal sepsis (signs of fast breathing and high heart rate among infants less or younger than 2 months), birth asphyxia (signs of low breathing and low heart rate) are the most common and important causes of infant mortality rate in the world, especially South Asia.

Health Awareness

Health awareness is an important indicator to reduce neonatal, infant and child mortality rates. Research indicates that if families/mothers know the maternal and newborn care components, the importance of seeking timely and professional healthcare significantly contributes towards lower infant mortality rate and improving infant and maternal health. Health awareness components include knowledge about prenatal care such as antenatal visits during pregnancy, natal care; skilled birth attendance and newborn care at birth and postnatal care; essential components of newborn care after delivery such as skin-to-skin contact, cord cares, exclusive breastfeeding, preventive practices for infectious diseases, danger signs of illness immunization and others (Lassi and Bhutta 2015; Bhutta et.al 2013; UNICEF 2018; Abuqamar, Coomans & Louckx 2012).

Bahawalpur

Bahawalpur is situated in the south region of Punjab, Pakistan and people have an agricultural and feudal background. In 2014 MICS survey indicated that Bahawalpur has a higher infant mortality rate which pushes international development partners such as UNICEF to initiate newborn healthcare-focused programs in Bahawalpur to increase the infant survival rate. This remarkable couple health workers

program was initiated in 2014 and an assessment of this program was done in 2018. This paper will analyze the components of the couple health workers' program and its link with the infant mortality rate.

Health progress in Bahawalpur from 2014-2018		
	2014	2018
Diarrhea	15.1 (0-59 months reported cases)	11.5 %
No advice treatment sought for diarrhea	27.9	19.6
Seeking skilled birth attendance	41.2	60.6
Traditional Birth Attendance (TBA)	55.1	38.5
Delivery at the health facility	40.7	58.7

Source: Multiple Indicators Survey (MICS) 2017-2018, Bureau of Statistics Punjab, Pakistan

Results and Discussions

The data on the infant mortality rate from 2014-2018 is used to analyze the role of the healthcare awareness program to reduce the infant mortality rate in Bahawalpur.

Community Interventions

Healthcare awareness is defined as the knowledge of mothers or families about the important indicator of maternal and infant care which includes antenatal, natal and postnatal care, skilled birth attendance, danger signs during pregnancy, danger signs of the infant during the post-neonatal period such as fast/low breathing, low/fast heart rate, core care, exclusive breastfeeding, immunization, preventive practices of diarrhea and respiratory infection. The government's responsibility is not just to build health facilities and increase health coverage in the communities. The awareness among local communities to utilize these services is as important as the availability of health facilities. If the government builds educational infrastructure such as schools or colleges in the communities, it does not mean it will influence equally all categories of people and they will utilize the available resources. The awareness to utilize the available resources, their importance and the knowledge of the consequences of non-utilization should be promoted and delivered to the people to sensitize the significance of the usage. Similarly, in the case of healthcare, usage of available healthcare facilities depends on the classification of people or the demographic characteristics such as ethnicity, gender, rural/urban areas, education level, income level, cultural texture

and others. Most rural communities require awareness about the available health facilities, the significance of utilization of the existing health system, and the consequences of the non-utilization of the prevailing health services. They do not know how important is to professionally seek maternal care, visit health facilities for newborn care, to know about preventive health practices to save infant life.

Health awareness contains various elements and needs serious implications according to the health conditions of the community which is mostly based on health indicators such as infant mortality, child mortality rate and maternal mortality rate. The promotion of the right knowledge at the right time to the relevant members is extremely important for the improvement of health indicators and this is a continuous process.

In Bahawalpur government of Punjab experienced a high infant mortality rate (83) in 2014, despite the provision of health facilities at the local level and lady health workers initiatives at the household level not much improvement has been observed in the reduction of infant mortality rate.

Afterward, in collaboration with UNICEF, they realized there are some unserved areas where no health awareness is provided due to tough conditions and strict cultural barriers of the areas. Lady health workers are not working in those areas because it requires security and transportation to move from one community to another. People are not willing to interact with female health workers and it is safe for female health workers to move around the area alone. Under this hard situation, they introduced a couple of health workers' programs consisting of one male and one female health worker and make sure both had blood relations as per the community's cultural values. The vehicle was provided to the couple (sister/brother, husband/wife, son/mother, nephew/uncle, niece/uncle) and they were trained on the health indicators. It was convenient for the couple to move around the area and provide health knowledge among local communities. The male health worker educates the male members of the community and the female health workers educate the female members of the households. This was a great success as they cater to the needs of the community as per cultural values.

Moreover, they revised the training manual of the community health workers, couple and lady health workers. They added more awareness indicators on newborn care as the first 28 days of newborn which is also called neonatal care is critical and needs serious health care practices. Research indicates that neonatal death contributes hugely towards infant mortality, so it requires to pay more focus on neonatal care to reduce the infant mortality rate. The government of Punjab focused on neonatal care and designed health awareness programs to educate the local communities on the importance of following neonatal care practices.

(Bhutta and Lassi 2015) discussed community interventions-based community participation and health-care awareness are significant to reduce infant and neonatal mortality because newborn care practices such as cord care, exclusive breastfeeding, skilled birth attendance, immunization and management of infectious diseases in infants are preventive measures and these preventive health practices have a positive health outcome to minimize the risk of infant mortality. They emphasized establishing women's groups at the local and mobilized them about newborn health practices.

The couple's health workers program did the same job in remote areas of Bahawalpur, they established women and men support groups to mobilize the whole family on various health indicators as the knowledge of male members is also important to change healthcare-seeking behavior.

Couple health works project is initiated with the concept of educating both husband and wife about maternal and infant care practices. This excellent project works well in the areas where people do not have enough knowledge and cultural beliefs are strong on traditional healthcare practices. This project acknowledged the significant role of the male member in seeking professional healthcare for mother and infant survival. The intervention of male health workers with female health workers generates positive results in healthcare-seeking behavior for mothers and infants which increased pregnant women's access to professional healthcare facilities and modify attitudes towards newborn care practices over traditional. The MNCH authority planned this project in collaboration with UNICEF in Bahawalpur.

Prenatal care

Prenatal/Antenatal care is important for maternal and infant health as the baby's health links with the mother's health. Pregnant mothers seek 4 antenatal visits in different periods and make check-ups for blood pressure, urine, blood test and weight measurement. These check-ups determine their health status and health professionals suggest medicine according to their health situation for health delivery. Moreover, during antenatal visits mothers are informed about the key newborn healthcare components. The health professionals guide them about the importance of newborn skilled healthcare, birth preparedness, breastfeeding counseling, nutrition, knowledge of danger signs to seek timely care, and the consequences to ignore critical newborn care indicators (Bhutta et.al 2005). But these elements depend on the type of health facility normally public hospitals in developing areas do not cover the health awareness features as part of antenatal care. In urban areas, it may not be needed as mothers are literate and educated and education is linked with good health awareness. Educated mothers know about the importance of professional maternal and newborn care and they prefer to seek professional and timely healthcare.

This is most needed in remote areas due to a lack of education level and firm cultural/traditional beliefs. In rural areas of Bahawalpur, women do not have access to government hospitals, but the government of Punjab established health facilities. Every health facility has skilled health staff to deliver 24-hour services to maternity patients. Apart from the health facilities, the government also took the initiative of lady health workers to provide door-to-door health services in remote and inaccessible areas. Under this MRNCH program lady, health workers are trained on various important health indicators related to maternal and newborn care. They work at the village level and make visits at the household level to provide health awareness, particularly on maternal care, sometimes do antenatal check-ups, provide iron tablets, guide them about newborn care and counseling on breastfeeding, family planning and nutrition components. Before 2014 the training manual of the lady health workers did not contain detailed information on newborn care, instead more focused on maternal health and family planning. Women were getting antenatal care but the information component on newborn care was missing.

Skilled Birth Attendance

Skilled birth attendance indicator defines the delivery in presence of professional or skilled health staff irrespective of the place of delivery. This component is highly linked with infant mortality as research indicates that delivery without skilled staff creates dangerous consequences. The natal period which is defined as the probability of dying within the first 28 days of birth is the highest contributor to the infant mortality rate, is very critical and the newborn needs proper immediate care at the time of delivery such as exclusive breastfeeding, drying and warming the baby (Bhutta et.al 2013; 2005; Batieha et al. 2016).

That is why it is highly recommended for deliveries to a health facility or the presence of skilled health professional staff. But the situation is different in the case of Bahawalpur where skilled birth attendance was not much practiced before 2014. According to a multiple indicator survey (2014), 41.1% of women seek skilled birth attendance in Bahawalpur. Whereas 55.1% receive traditional birth care and traditional birth attendants do not have professional health experience and knowledge. The traditional birth attendant practice is more prevalent in rural or remote areas and local people often call those women “*Dai*”. She just has informal delivery experience based on cultural or traditional practices, not any formal health knowledge. This is very dangerous as she is unable to deal with delivery complications and danger signs of newborns. Despite this risky and unsafe delivery practice people in rural areas of Bahawalpur rely on traditional birth attendants compared to skilled birth attendants. There are many reasons behind this health care-seeking attitude one of them is the cultural belief that “*Dai*” is more experienced than skilled health staff and she has more knowledge about newborn care.

Moreover, people preferred delivery at home as per MICS (2014) results around 60 % of women delivered at home and in that case, they seek traditional birth attendance. “Dai” is mostly living in the same vicinity and available 24 hours; people can call her any time for examination and delivery. This is economical as she does not charge much and convenient also because people do not have transportation to take pregnant women to the health facility. It indicates that they seek delivery treatment for traditional birth attendance not just because they believe in her but also due to her availability and accessibility. During this process, they overlooked the critical care of a newborn and the dangerous consequences of not taking skilled health care at the time of delivery and even post-delivery which is defined as post-natal care.

After 2014, UNICEF took an important initiative with the government of Punjab and revised the lady health workers training manual and added various components on health care awareness and importance of seeking professional or skilled newborn health care. They also initiated a couple of health workers programs to cover the unserved areas of Bahawalpur such as the river belt. The couple health workers (CHWs) program is comprised of one male and one female health worker, and they are trained on important newborn and maternal health care indicators with a special focus on newborn care. The CHWs were responsible for visiting remote areas and promoting health awareness on skilled newborn care at the household level. They created health awareness on skilled birth attendance, cord care of newborns, danger signs of newborns such as fast breathing, low breathing, fast heart rate, low heart rate, low birth weight, and maternal health care. They established community groups with influential members of the local community and mothers/pregnant women to educate them about the critical time during pregnancy, delivery, newborn care, and the importance of preventive health practices to save infant life. After 4 years MICS (2018) results indicate the health care seeking behavioral change in people living in rural areas of Bahawalpur such as traditional birth attendance reduced from 55.1% to 38.5%, skilled birth attendance increased from 41.2% to 60.6% and 58.7% women seek delivery at a health facility compared to 40.7% in 2014.

Neonatal and Post neonatal care (Infant care)

Neo-natal is the period from birth to twenty-eight days of life whereas post-neonatal refers to the care given to child between age of 28-364 days of his life. Postnatal care is provided to both mother and child immediately after birth. With the post-natal period being extremely crucial for the health of mother and child, certain necessary healthcare methods and behaviors need to be adopted. As timely or prompt recognition, diagnosis, and appropriate treatment are not conducted, then there is a high likelihood of

infant mortality (Ekwochi et al. 2015). After 2014, through the CHWs program the government promoted different components of essential care for infants among the local communities which include early breastfeeding, exclusive breastfeeding for 6 months, put the baby directly into skin-to-skin contact immediately after birth, keep the baby warm, keep the baby dry and baby wiped/cleaned soon after birth. They also educate mothers about the danger signs of illness in infants when they need immediate healthcare such as difficulty in breathing after birth, mothers were told about the measures taken to make the baby breathe normal like put the baby upside down, medicine, and an oxygen mask. Moreover, knowledge about clean, new and sterilized instruments used to cut the baby cord as home deliveries are still common in Bahawalpur and people used old blades and scissors without sterilization to cut the cord, this home-based cord care practice is very dangerous and causes serious infection. So, knowledge about using a new blade and if the instrument is not new then boiled or sterilized before use, is promoted among families to avoid unsafe health practices and bad circumstances.

Furthermore, there is common practice to use traditional knowledge about cord care and apply home-based material on cords such as ash, and animal dung and most of the time families seek this information from the traditional birth attendants. Through the community health awareness program families were informed about safe cord care practices and told to apply antiseptic material to the cord and avoid using ash and animal dung. They were also educated about the hygiene component to wash hands before touching or holding the infant. The families were not aware of the danger signs of illness in newborns.

- Not able to feed or stopped feeding over a few hours.
- Fits soon after birth.
- Fast breathing (60 breaths or more in 1 minute)
- High temperature (37.5 C or more)
- Very low temperature (35.4 C or less)
- Yellow Soles

Knowledge about the importance of vaccination of infants; Polio, Measles, Hepatitis, Typhoid, Chicken pox. Examination of the baby cord during the first two days after birth; Examine the baby cord, take the temperature, weight, height measurements, and counsel for breastfeeding. As malaria can be a lethal disease for infants, the families were given information about preventing infants from Malaria and shared how they can prevent their children from malaria. The community mobilizer educated the family members that they need to protect the child from mosquitoes. The information about preventive measures that need to be taken to prevent infants from dengue was also shared among communities and the

preventive measures included covering up water/not getting close to it, covering the body, prevention against mosquitoes, and applying mosquito repellent. The information about danger signs of pneumonia; pain in the ribs/cold, fever and breathing issues, motion and dehydration. Danger signs of diarrhea; motion/vomit/fever, dehydration, shrinking of the skin.

In 2018, the assessment of the CHWs project in Bahawalpur showed improvement in seeking professional healthcare treatment, and knowledge about newborn essential care practices. The family's knowledge has increased about the importance of maternal and infant timely and professional care, skilled birth attendance, danger signs of illness in infants and preventive measures that need to be taken to prevent the infants from infectious diseases such as diarrhea. (UNICEF, 2018).

Discussions

This paper builds on the work of Lassi and Bhutta (2015), Bhutta et.al (2013), Schell et al (2007), Abuqamar, Coomans & Louckx (2012), Pestronk et.al (2003), and Bhutta et.al (2005) that linked health awareness with neonatal and infant mortality rate. This research has focused on the role of health awareness to reduce infant mortality rates through in-depth analysis.

This study's results highlight the importance of community-based health awareness programs to reduce infant mortality rates in Bahawalpur. With the promotion of health knowledge about antenatal care, skilled birth attendance, immediate newborn care, danger signs of illness and preventive practices to deal with infectious diseases among infants are provided to the families at the local level, significant improvement has been observed in the health indicator which leads to decrease in infant mortality rate in Bahawalpur from 2014-2018. Before 2014 local communities did not have awareness of the significance of newborns and professional and skilled birth attendance. They mainly relied on traditional health practices, lacked danger signs of illness in infants, unaware of the need to seek timely healthcare. Most rural areas are deprived of health mobilization programs due to the cultural structure of the area which hinders women health workers to create awareness about healthcare-seeking behavior.

Although during that time the government of Punjab recognized the importance of community interventions to improve health indicators in rural areas of Bahawalpur and initiated a few projects. But those programs were more focused on antenatal visits, tetanus and family planning and lack the components of healthcare awareness on the importance of newborn care, skilled birth attendance and knowledge of danger signs of illness. As these indicators contribute a lot to reducing the infant mortality rate. After 2014, UNICEF revised the community healthcare workers' training manual and added the key healthcare awareness indicators, also initiated a couple health workers' programs in the unserved areas of

Bahawalpur. These steps impact care-seeking behavior and change the attitude of local people towards on-time and skilled healthcare that contributes to reducing the infant mortality rate in Bahawalpur.

Conclusion

The government of Punjab needs to develop and implement healthcare awareness programs at the local level in areas where the infant mortality rate is high. Most of the population lives in rural areas and lacks the importance of professional health care-seeking practices which have adverse effects on infant health and lead to an increase in mortality rates.

But to initiate these effective health awareness strategies/interventions in the communities, especially in remote or rural areas, it is necessary to understand the prevailing health practices and local belief systems. Good behavior change strategies can only be introduced by understanding the local community structure and the reasons to exercise the existing health practices.

References

- Ahmed, S., Sobhan, F., & Islam, A. (2001). Neonatal morbidity and care-seeking behaviour in rural Bangladesh. *Journal of tropical pediatrics*, 47(2), 98-105.
- Anand, K., Kant, S., Kumar, G., & Kapoor, S. K. (2000). "Development" is not essential to reduce infant mortality rate in India: experience from the Ballabgarh project. *Journal of Epidemiology & Community Health*, 54(4), 247-253.
- Ashworth, A., & Waterlow, J. C. (1982). Infant mortality in developing countries. *Archives of Disease in Childhood*, 57(11), 882-884.
- Asif, M. F., Pervaiz, Z., Afridi, J. R., Safdar, R., Abid, G., & Lassi, Z. S. (2022). Socio-economic determinants of child mortality in Pakistan and the moderating role of household's wealth index. *BMC pediatrics*, 22(1), 1-8.
- Aslam, M., & Kingdon, G. G. (2012). Parental education and child health—understanding the pathways of impact in Pakistan. *World Development*, 40(10), 2014-2032.
- Batieha, A. M., Khader, Y. S., Berdzuli, N., Chua-Oon, C., Badran, E. F., Al-Sheyab, N. A., ... & Al-Qutob, R. E. J. (2016). Level, causes and risk factors of neonatal mortality, in Jordan: results of a national prospective study. *Maternal and child health journal*, 20(5), 1061-1071.
- Bicego, G. T., & Boerma, J. T. (1993). Maternal education and child survival: a comparative study of survey data from 17 countries. *Social science & medicine*, 36(9), 1207-1227.
- Ekwochi, U., Ndu, I. K., Osuorah, C. D., Amadi, O. F., Okeke, I. B., Obuoha, E., ... & Obumneme-Anyim, N. I. (2015). Knowledge of danger signs in newborns and health seeking practices of mothers and care givers in Enugu state, South-East Nigeria. *Italian journal of pediatrics*, 41(1), 1-7.

- Fikree, F. F., Azam, S. I., & Berendes, H. W. (2002). Time to focus child survival programmes on the newborn: assessment of levels and causes of infant mortality in rural Pakistan. *Bulletin of the World Health Organization*, 80, 271-276.
- Frey, R. S., & Field, C. (2000). The determinants of infant mortality in the less developed countries: a cross-national test of five theories. *Social Indicators Research*, 52(3), 215-234.
- Ikeako, L. C., Onah, H. E., & Iloabachie, G. C. (2006). Influence of formal maternal education on the use of maternity services in Enugu, Nigeria. *Journal of obstetrics and gynaecology*, 26(1), 30-34.
- Khan, Q. (2019). REVIEWING THE SOCIO-CULTURAL CAUSES OF INFANT MORTALITY IN PAKISTAN. *Journal of Sociology*, 3(1), 43-51.
- Lau, C., Ambalavanan, N., Chakraborty, H., Wingate, M. S., & Carlo, W. A. (2013). Extremely low birth weight and infant mortality rates in the United States. *Pediatrics*, 131(5), 855-860.
- Lozano, R., Wang, H., Foreman, K. J., Rajaratnam, J. K., Naghavi, M., Marcus, J. R., ... & Murray, C. J. (2011). Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis. *The lancet*, 378(9797), 1139-1165.
- Målqvist, M., Nga, N. T., Eriksson, L., Wallin, L., Ewald, U., & Persson, L. Å. (2008). Delivery care utilisation and care-seeking in the neonatal period: a population-based study in Vietnam. *Annals of tropical paediatrics*, 28(3), 191-198.
- MICS. (2014). MICS 2014 Final Report. Bureau of Statistics Punjab. Government of The Punjab, Pakistan. Retrieved from <https://bos.gop.pk/finalreport>
- MICS. (2018). Multiple Indicator Cluster Survey. Bureau of Statistics Punjab. Government of The Punjab, Pakistan. Retrieved from <https://bos.gop.pk/mics>
- Naveed, T. A., Ullah, S., Jabeen, T., & Sabir, S. (2011). Socio-economic Determinants of Infant Mortality in Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 8, 728-40.
- Oza, S., Lawn, J. E., Hogan, D. R., Mathers, C., & Cousens, S. N. (2014). Neonatal cause-of-death estimates for the early and late neonatal periods for 194 countries: 2000–2013. *Bulletin of the World Health Organization*, 93, 19-28.
- Patel, K. K., Rai, R., & Rai, A. K. (2021). Determinants of infant mortality in Pakistan: evidence from Pakistan Demographic and Health Survey 2017–18. *Journal of Public Health*, 29, 693-701.
- Safdar, S., Inam, S. N., Omair, A., & Ahmed, S. T. (2002). Maternal health care in a rural area of Pakistan. *J Pak Med Assoc*, 52(7), 308-11.
- The World Bank. (2022). Mortality rate , Infant (per 1,000 live births)-Pakistan. Retrieved from <https://data.worldbank.org/indicator/SP.DYN.IMRT.IN?locations=PK>
- UNICEF, USA (2019, March 14). Infant Mortality rate Definition and Guide. [https://www.unicefusa.org/stories/infant-mortality-rate-definition-and-guide/35658?utm_campaign=20221001_TOT&utm_medium=CPC&utm\[E2%80%A6\]ogle_delve &initialms=CPC TOT 2022 TOT 20221001 Google delve&gclid=Cj0KCQjwn P-](https://www.unicefusa.org/stories/infant-mortality-rate-definition-and-guide/35658?utm_campaign=20221001_TOT&utm_medium=CPC&utm[E2%80%A6]ogle_delve &initialms=CPC TOT 2022 TOT 20221001 Google delve&gclid=Cj0KCQjwn P-)

[ZBhDiARIsAH3FSReGvHokmUdksBXM8zczcyneieIX1C_oKcrcS5nhMzelAUKdMb5JBw_UaAl4ZEALw_wcB](#)

UNICEF. (1996). *The state of the world's children*. Oxford University Press for UNICEF.

Vikram, K., Desai, S., & Vanneman, R. (2010). Maternal education and child mortality: Exploring the pathways of influence. *College Park: University of Maryland*.

Woodbury, R. M. (1922). The relation between breast and artificial feeding and infant mortality. *American Journal of Epidemiology*, 2(6), 668-687.

World Health Organization. (1981). *Development of indicators for monitoring progress towards health for all by the year 2000*. World Health Organization.

Zanconato, G., Msolomba, R., Guarenti, L., & Franchi, M. (2006, February). Antenatal care in developing countries: the need for a tailored model. In *Seminars in Fetal and neonatal Medicine* (Vol. 11, No. 1, pp. 15-20). WB Saunders.