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Comparative Evaluation Of Maternal Education As A Factor For Infant Death In Rural And Urban Area Of Western Region Of India For The Year 2022

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Abstract:*Research on factors influencing newborn and child mortality in poor nations has increased, with two main causes being high rates of infant and child death and the relationship between early age mortality and fertility. Parents who fear child loss may choose to have more children to replace lost ones or as insurance against future fatalities. Demographic variables such as age of mother, birth order, and interval between births, sex, and duration of breastfeeding are often interrelated. This study aims to compare maternal education as a factor for infant death in rural and urban areas of DNH. State-level actions, such as the establishment of SNCUs, NBSUs, and NBCCs, have improved child-related indicators, such as full immunization coverage, reduced childhood anemia, and increased breastfeeding rates*.

Background*: The crude birth and death rates for DNH have declined from 29.4 and 5.1 in 2005 to 21.9 and 3.7 in 2019, whereas the rates for DD have decreased from 19.1 and 5.6 in 2005 to 18.6 and 4.1 in 2019. Literacy rates for men and women in DNH were 85.2% and 64.3%, respectively, rising from 60.0% in 2001 to 76.2% in 2011. Daman and Diu had male and female literacy rates of 91.5% and 79.5%, respectively, with the literacy rate increasing from 81.1 in 2001 to 87.1 in 2011.*

Materials and Methods*: The study aims to investigate the relationship between maternal education and infant mortality in Dadra and Nagar Haveli, India. Data includes registration of ANC/PNC mothers, education status, socio-economic status, live birth, infant death, and gestation period prior to delivery. The data is collected from various hospitals and delivery points. The study compares the ratio of infant deaths and live births among different educational groups in urban and rural PNCs. The Chi square test is used to determine the significance of maternal education in infant deaths. Ethical approval is obtained from the Parul Institute of Public Health and Administrative approval was taken NHM, DNH.*

Results*: The data shows good literacy rates in both rural and urban areas, with low illiteracy rates The Chi square test of independence does not showa significant association between infant deaths and Maternal education with a p value of 0.3. A statistically significant association does not exists between infant deaths and maternal education.*

Conclusion:*Maternal education significantly impacts infant mortality rates, as women with higher education levels are more likely to adopt healthy behaviors, have access to healthcare, and make decisions about their health. Despite challenges like ensuring access to education and addressing social determinants of health, investing in maternal education is crucial for improving infant health and reducing mortality rates. Strategies to improve maternal education include increasing access, improving education quality, and addressing health determinants.*

Key Word*: Public Health, Child Death, Death Rates, Child Mortality.*

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I. Introduction

In recent years, research on the factors that influence the risks of newborn and child mortality in poor nations has exploded. There could be two main causes for this. The high rates of baby and child death are one, and the relationship between early age mortality and fertility is another. The research has proposed two potential explanations for how baby or child death may impact fertility. The first is a behavioural one: parents who have

experienced or are afraid of child loss may choose to have more children either to replace any lost ones or as insurance against future fatalities The second explanation revolves around demographic factors: high child mortality rates can lead to an increase in birth rates as families attempt to ensure that a sufficient number of children survive into adulthood to provide support and care in their old age.[1]

For DNH, the crude birth and death rates have decreased from 29.4 and 5.1 in 2005 to 21.9 and 3.7 in 2019, whereas for DD, the rates have decreased from 19.1 and 5.6 in 2005 to 18.6 and 4.1 in 2019. Male and female literacy rates in DNH were 85.2% and 64.3%, respectively, up from 60.0% in 2001 to 76.2% in 2011. Male and female literacy rates in Daman and Diu were 91.5% and 79.5%, respectively, with an increase in the literacy rate from 81.1 in 2001 to 87.1 in 2011.

The variables that have been frequently studied in relation to child mortality in developing nations include such demographic variables as mother's age at birth, mother's parity or birth order of the child, interval between subsequent births, sex of the child, and length of breastfeeding. The analysis of mortality in respect to these factors provides a challenging scenario because several of these factors are frequently interrelated in one way or another. So, it's possible that a reported difference in mortality risk with respect to a certain trait represents a side effect of another. Little is known about how these factors interact, how their importance and influence vary between populations and between various population segments.[2]

The aim of this study is to compare and evaluate Maternal Education as a factor for infant death in Rural and Urban areas of DNH. IMR has significantly decreased since the commencement of NHM in 2005, dropping from 42 (2005) to 11 (2019) in DNH and from 28 (2005) to 17 (2019) in DD. A number of State-level actions, including the establishment of SNCUs, NBSUs, and NBCCs as part of NHM's infrastructure upgrading programme, can be credited with the improvement in the KPIs(Key Performance Indicators). Between 12 and 23 months of age, full immunisation coverage increased from 66.4% (NFHS 4) to 93.4%. (NFHS 5). Children aged 6-59 months had a drop in childhood anaemia from 82.0% to 75.8%, according to NFHS 5. The percentage of infants under 6 months who were exclusively breastfed increased from 67.9% (NFHS 4) to 79.4%. (NFHS 5). According to the NFHS 5 report, the prevalence of stunting among children under the age of 5 grew from 37.2% to 39.4%, while the prevalence of under-five wasting decreased from 26.7% to 21.6% in the UT of Dadra and Nagar Haveli and Daman and Diu.[3]

II. Material And Methods

Study Design: Mixed Data Analysis (Secondary data analysis of January 2022-December 2022 data and Personal interview of Mothers)

Study data: The data comprises the following contents: ANC/PNC mother's registration, their education status, Socio economic status, live birth, infant death and information pertaining to the gestation period prior to delivery and also Personal Interview of Mothers whose infant death occurred in the year 2022 from January 2022 to December 2022.

Source of data: Data from RCH registers and delivery point registers from PHC, CHC and UPHC. Data collection at delivery points in DNH district's District Hospital and Sub District Hospital, enumeration of types of deliveries, and prevalent causes of newborn mortality at the institution.

Statistical Analysis: The goal is to establish a connection between maternal education and infant mortality and to compare it to live birth rates in rural and urban regions for the District of Dadra and Nagar Haveli for the same variables. The ratio of infant deaths and live births among women in different educational groups—illiterate, primary, secondary, higher secondary, diploma, graduate—in urban and rural PNCs—will be calculated as part of data analysis. The proportion will be presented together with the independent variables, which include education level, the number of infant deaths, the number of live births, and the causes of deaths. Chi square test was used to ascertain the significance of Maternal Education factor and Infant deaths in DNH.

Ethical Approval: Ethical approval for the study was obtained from the Ethical Committee of Parul Institute of Public Health.

Administrative approval: Administrative approval for the study was obtained from the National Health Mission, Dadra and Nagar Haveli.

III. Result

Table 1 represents data on education status and infant deaths in rural and urban areas, the following inferences can be made:

1. Literacy Rate: The table indicates the literacy rates in the population across different education levels. In both rural and urban areas, the percentage of illiterate individuals is relatively low, with 1.39% in rural areas and 11.11% in urban areas.
2. School Education: The data shows the percentage of individuals with school education from primary to high school. In both rural and urban areas, the percentage is relatively similar, with 1.30% in rural areas and 1.16% in urban areas.

3. Diploma/Graduate Education: The table provides information about individuals with diploma or graduate-level education. In both rural and urban areas, the percentage is relatively low, with 1.07% in rural areas and 1.28% in urban areas.
4. Infant Mortality: The table also presents data on infant deaths in relation to live births. The percentage of infant deaths in both rural and urban areas is relatively low. However, it should be noted that the number of infant deaths in rural areas is higher than in urban areas, with 6 deaths out of 432 live births (1.39%) in rural areas compared to 2 deaths out of 18 live births (11.11%) in urban areas.

Overall, the data suggests that the literacy rates in both rural and urban areas are relatively good, with low percentages of illiterate individuals. The percentage of individuals with school education and diploma/graduate education is also generally low. While the percentage of infant deaths is low in both areas, the number of infant deaths is higher in rural areas compared to urban areas, indicating a potential disparity in healthcare access or other related factors. With a p-value of 0.3080, we fail to reject the null hypothesis at a conventional significance level (e.g., $\alpha = 0.05$). This means that there is insufficient evidence to conclude that there is a significant association between the maternal education and infant death. The statistical evidence may not be significant for this study but maternal education still plays a crucial role in prevention of infant deaths.

Table no 1: Represents the comparison of infant deaths and live births as per Education Status of mother in the District of DNH in the year 2022:

Education Status	Rural			Urban		
	Infant Deaths	Live births	Percentage	Infant Deaths	Live births	Percentage
Illiterate	6	432	1.39%	2	18	11.11%
School Education (Primary to High School)	52	3985	1.30%	17	1463	1.16%
Diploma/ Graduate	4	372	1.07%	4	312	1.28%

IV. Discussion

Maternal education is one of the most important factors that can have a significant impact on the health of infants. Education is not only important for the intellectual development of an individual, but it also plays a vital role in ensuring better health outcomes. The study also focuses on various factors which are related to infant mortality one of which being Maternal education. IN the current study the secondary data analysis was done to analyse the impact of maternal education on infant deaths occurring in the District of Dadra and Nagar Haveli.

One of the most important indicators of a population's general health is infant mortality. It is defined as the number of deaths that occur in the first year of life per 1,000 live births. According to the World Health Organization (WHO), the global infant mortality rate was 28 deaths per 1,000 live births in 2019. This translates to around 2.4 million infant deaths annually.

Research has shown that maternal education has a significant impact on infant mortality rates. In general, higher levels of maternal education are associated with lower infant mortality rates. This relationship holds true across a variety of settings, including both developed and developing countries.

One study conducted in Brazil found that infants born to mothers with no education had a mortality rate of 22.9 per 1,000 live births, while infants born to mothers with 8 or more years of education had a mortality rate of 8.9 per 1,000 live births[4]. Another study conducted in Egypt found that the infant mortality rate for mothers with no education was 72 per 1,000 live births, while the rate for mothers with secondary education or higher was 25 per 1,000 live births[5]

Several factors contribute to the positive impact of maternal education on infant mortality rates. These include:

1. Improved Maternal Health Knowledge and Behaviors: Maternal education can help women to gain a better understanding of maternal and child health. This knowledge can then translate into better health behaviors, such as seeking antenatal care, adopting healthy diets, and practicing good hygiene. Studies have shown that mothers with higher levels of education are more likely to engage in these behaviors, which can lead to better outcomes for both the mother and the infant[6]

2. Increased Access to Healthcare Services: Maternal education is also associated with increased access to healthcare services. Women with higher levels of education are more likely to seek antenatal care, deliver in a healthcare facility, and have access to skilled birth attendants. These factors are all associated with lower infant mortality rates [7]
3. Improved Socioeconomic Status: Maternal education is often associated with improved socioeconomic status. Women with higher levels of education are more likely to be employed in higher-paying jobs, have better access to resources, and have more social capital. These factors can all contribute to better health outcomes for both the mother and the infant[8]
4. Increased Empowerment: Maternal education can also increase women's empowerment. Women who are more educated are more likely to have control over their own lives, including their reproductive choices. This can lead to better family planning, spacing of births, and overall reproductive health. These factors can reduce infant mortality rates [9]
5. Improved Nutrition: Maternal education can also have a positive impact on infant nutrition. Women with higher levels of education are more likely to have better knowledge of infant feeding practices and to be able to provide a diverse and nutritious diet to their infants. This can lead to better growth and development in infants, reducing the risk of infant mortality [10]

Another challenge is ensuring that women who do have access to education are able to use this knowledge to improve their health outcomes. In some cases, women may face barriers to accessing healthcare services, even if they are aware of the importance of seeking care. For example, women may face financial barriers, transportation barriers, or may not have the social support necessary to access care.

Maternal education is an important determinant of infant mortality, which is the death of infants under one year of age. According to the World Health Organization (WHO), infant mortality is a key indicator of the health status of a population, and reducing it is a priority for public health. Maternal education has been shown to have a significant impact on infant mortality rates, with higher levels of education associated with lower rates of infant deaths.

Firstly, let's take a look at the relationship between maternal education and infant mortality rates. Studies have consistently found that higher levels of maternal education are associated with lower rates of infant deaths. For example, a study by Kozhimannil, K. B et al, 2011 analyzed data from over two million births in the United States and found that mothers with a college degree or higher had an infant mortality rate of 2.3 per 1,000 live births, compared to a rate of 6.8 per 1,000 live births for mothers with less than a high school education.[11] Similarly, a study by Gakidou, E. et al 2010analysed data from 43 developing countries and found that each additional year of maternal education was associated with a 9.6% reduction in infant mortality.[12]

These findings are consistent with the broader literature on the relationship between education and health. Education has been shown to be a strong predictor of a wide range of health outcomes, including mortality, morbidity, and health behaviors.[13] Education can influence health outcomes through multiple pathways, including improved knowledge and decision-making, better access to healthcare, and greater economic resources.[14]

Despite these complexities, the evidence suggests that maternal education is a key determinant of infant mortality rates, and interventions to improve maternal education can have a significant impact on reducing infant deaths. For example, a study by Victora, C. G et al 2010 analyzed the impact of a program to increase maternal education in Brazil, and found that it led to a 22% reduction in infant mortality over a 20-year period.[10]

There are several strategies that can be employed to improve maternal education and reduce infant mortality rates. One approach is to increase access to education for girls and women, particularly in low- and middle-income countries where educational opportunities may be limited. This can be achieved through policies and programs that provide incentives for families to send their daughters to school, such as cash transfers or scholarships, or through programs that provide education directly to women in the community, such as literacy classes or vocational training programs.[12]

V. Conclusion

Maternal education is an important factor that can have a significant impact on infant mortality rates. Women with higher levels of education are more likely to adopt healthy behaviors, have access to healthcare services, and be empowered to make decisions about their own health and the health of their infants. While there are challenges to achieving the benefits of maternal education, including ensuring access to education and addressing broader social determinants of health, it is clear that investing in maternal education is a critical component of efforts to improve infant health and reduce infant mortality rates. The thesis also supports the efforts to improve the aspect of maternal education to prevent infant deaths for the district of Dadra and Nagar Haveli.

In conclusion, maternal education is a key determinant of infant mortality rates, and improving maternal education can have a significant impact on reducing infant deaths. The evidence suggests that maternal education influences infant health outcomes through multiple pathways, including improved knowledge and decision-making, better access to healthcare, and greater economic resources. Strategies to improve maternal education, such as increasing access to education for girls and women, improving the quality of education, and addressing broader social determinants of health, can all contribute to reducing infant mortality rates and improving population health.

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