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CAUSES OF UNDER-FIVE MORTALITY IN DISTRICT QUETTA BALOCHISTAN

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ABSTRACT

Child mortality in underdeveloped nations, including Pakistan, is a crucial well-being indicator shaped by diverse factors. The occurrence of child mortality is associated with various socioeconomic factors the most important is maternal education. Pakistan has made noteworthy progress in reducing child mortality over the years, transitioning from 141 deaths per 1,000 live births in 1990 to 69.5 deaths per 1,000 live births in 2019. However, Balochistan, one of Pakistan's provinces, stands out with notably high maternal mortality rates (298 deaths per 1,000 live births), the highest Infant Mortality Rate (IMR) at 48, and the highest under-5 mortality rate (U5MR) at 53. This research study investigates the underlying causes of under-five mortality, focusing on the level of parental education associated with under–five mortality within the Quetta district. The investigation focused on child mortality in peri-urban areas of the Quetta district, utilizing an explanatory sequential mixed-methods approach. A sample of 400 families, representing 216,352 children aged 0-59 months, was selected through a multistage sampling process. Quantitative data collected via survey interviews underwent thorough statistical analysis using bivariate and multivariate logistic regression in SPSS (version 20). Simultaneously, qualitative insights were extracted from 12 health professionals through purposive sampling and two focus group discussions. The information about mothers' educational background revealed that a sizable number of mothers were illiterate, with 317 participants (or 79.3%) falling into this category. Additionally, 74 participants (18.5%) had an elementary education, while only nine participants (2.3%) had a secondary education. While, father's education contains those 213 individuals, or 53.3% were determined to be illiterate, while others had varied degrees of education. To be more specific, 108 individuals (27.0%) had completed their primary education. A smaller proportion had completed their secondary education (58/ 14.5%), gained matriculation (12/3.0%), or even graduated (9/2.3%). When mother education was examined, it was discovered that illiterate women have a higher risk of their children dying before age five ($p = 0.005$). Maternal education significantly influences child mortality rates, as affirmed by both healthcare professionals' observations and existing literature. Educated parents are better equipped with essential knowledge about prenatal and postnatal care, can recognize warning signs of illness in their children, adhere to recommended health practices, and seek timely medical care. The promotion of parental education emerges as a fundamental strategy in the global effort to reduce child mortality and provide every child with a chance to thrive.

Keywords: Mortality, infant mortality, under-five mortality, socioeconomic factors, parental education, maternal education

INTRODUCTION

The child rate of mortality, according to the United Nations Children's Fund (2022), is the probability that a child will die before the age of five out of every 1000 live births. Children make up around one-third of the world's population. Globally, 5.2 million children died before turning five in 2019, with the impact being greater in developing nations (UNICEF, 2020). Low and middle-income countries (LMICs) have child mortality rates that are much higher than high-income countries (HICs), with a rate that is 18 times higher in LMICs (WHO, 2019). According to Lozano et al. (2011), Pakistan is ranked 154th out of 195 nations in terms of healthcare quality and accessibility. Although Pakistan has accomplished some achievements in decreasing child mortality from 141 deaths per 1,000 live births in 1990 to 69.5 deaths per 1,000 live births in 2019 (UNICEF, 2020), it still has one of the highest mortality rates for children under the age of five, exceeding the global rate of 37 deaths per 1,000 live births as of 2020. In comparison to the other four provinces of Pakistan, Balochistan has the greatest frequency of preventable fatalities among mothers, babies, and young children, according to data from the Multiple Indicators Cluster Survey conducted by the Government of Balochistan in 2019. With 298 fatalities per 1,000 live births, the maternal mortality rate (MMR) is frighteningly high. In comparison, the infant mortality rate (IMR) is 48 and the under-5 mortality rate (U5MR) is 53. The province has the highest Infant Mortality Rate in comparison to other provinces in Pakistan, and only 38% of deliveries there are attended by qualified birth attendants (Bashir et al, 2022).

Level of maternal education in Balochistan

Quetta	51 %
Chaghi	21.4%
Kharan	16.7%
Sibi	26%
Zhob	19.5%
Kalat	21.4%
Mastung	20.8%
Ghawadar	31%

SMART Survey Balochistan (2017/18)

In many nations, education for mothers has been showed to have a substantial effect on under-five mortality. A study assessed the key effects of rural-urban and maternal schooling on U5MR using the national family health surveys conducted in India from 1992–1993 and 2019–21. Children from urban families with mothers who completed post-secondary education had a lower U5M risk than children from rural families. Even after taking predictors into account, maternal education, especially secondary education, continued to be a protective factor for U5M in both rural and urban settings. (Bashir,2016). To prevent the U5M from dropping much more, there is a need to put more emphasis on secondary education for girls. According to research, raising mothers' educational levels dramatically drops the probability that their under-five children will pass away. Lower levels of U5M were found in babies born to moms with primary and secondary education as well as higher education (Moradhvaj & Samir, 2023) than in babies born to mothers with less education.

Prenatal care (ANC) is a chance to encourage a happy pregnancy experience and increase mom and child survival. Maternal education was strongly connected with the use of ANC and is another factor in the importance of prenatal care for the child's long-term growth and development. reduced wealth quintiles, and decreased maternal education, in general, better nutrition, prenatal care, postnatal care, and usage of institutional facilities during labor are provided to educated women and women in more affluent households, which lowers the risk of infant mortality (Kumar, Choudhary & Srivastava, 2019).

A study that used data from the 1992–1993 Indian National Family Health Survey to examine the effect of 'low' levels of maternal education on the closest factors of child mortality found that more educated women are more likely to use effective healthcare facilities to treat their children's illnesses and common diseases that are fatal among under–five children. Investigations are conducted on 22 outcomes, including those related to illness management, service use, child mortality and morbidity, and healthy behavior. Except for neonatal death and the efficient treatment of diarrhea, maternal education is a significant predictor of each of the outcomes, and even modest levels of education improve the chances of children growing up healthy and developing good health habits. (Bashir & Shah,2020).

According to Basu and Stephenson (2005), the study examines how women's education affects child health and fertility in Uganda. The analysis makes use of a regression discontinuity approach and the time of a nationwide reform that eliminated primary school fees in 1997 to identify causal linkages. All grade levels up to the end of secondary school saw an average improvement in educational achievement of nearly one year as a result of the reform. Women with greater education levels display many beneficial traits. (Bashir,2019). They typically postpone and lower overall fertility, prioritize early child health interventions, and have fewer undernourished children. The study also investigates the factors underlying these outcomes. Another study discovers that the observed patterns are influenced by the fact that women with higher levels of education are more likely to postpone marriage and utilize contraception before their first pregnancy.

Few studies have been able to establish a causal link between maternal education and under-5 mortalities, despite the demographic literature's suggestion that mother schooling is a major factor in determining children's odds of survival in low- and middle-income countries. (Bashir and Huma, 2017). Using a two-stage residual inclusion approach and incorporating individual-level data from Demographic and Health Surveys, the study reexamined the examples of Malawian and Ugandan universal primary education reforms. According to their findings, educating moms for an additional year decreased the likelihood that a child would die before the age of five in Malawi by 10% and in Uganda by 16.6% (Andrian**o** & Monden, 2019).

A study uses quasi-experimental modifications in the period of exposure to a school stipend program for identification to investigate the impact of maternal education on child mortality in Bangladesh. According to findings from the instrumental variable estimation, every additional year of education for mothers reduces baby and under-five mortality by roughly 20%. According to the study, an education stipend scheme can encourage maternal education, which in turn lowers child mortality. The results have significant policy ramifications for regions where infant death rates are still high: education changes are required to encourage women to attend school, which would significantly lower child mortality (Wu, 2022).

OBJECTIVES OF THE RESEARCH

- To examine the socio-economic cause of under-five- mortality.

RESEARCH QUESTIONS

- Does the educational level of mothers influence under-five mortality?

RESEARCH HYPOTHESIS

- Level of mother education is likely to be related to under-five mortality.

Methodology:

This research study investigates the underlying causes of under-five mortality, focusing on the level of parental education associated with under–five mortality within the Quetta district. The investigation focused on child mortality in peri-urban areas of the Quetta district, utilizing an explanatory sequential mixed-methods approach. A sample of 400 families, representing 216,352 children aged 0-59 months, was selected through a multistage sampling process. Quantitative data collected via survey interviews underwent thorough statistical analysis using bivariate and multivariate logistic regression in SPSS (version 20). Simultaneously, qualitative insights were extracted from 12 health professionals through purposive sampling and two focus group discussions.

Result:

Section-1: Univariate Analysis

This section included the frequency and percentages of the questions:

Table No-1: Demographic data (n=400)

Demographic characteristics		**F**	**%**
Deceased child age	0-11	249	62.3
	12-59	151	37.8
	Total	400	100.0
Respondent age	15-24	274	68.5
	25-34	126	31.5
	Total	400	100.0
Number of children	1-5	41	10.3
	5-8	236	59.0
	9-12	123	30.8
	Total	400	100.0
Mother education	Illiterate	317	79.3
	Primary	74	18.5
	Middle	9	2.3

	Total	400	100.0
Father education	Illiterate	213	53.3
	Primary	108	27.0
	Middle	58	14.5
	Matric	12	3.0
	Graduate	9	2.3
	Total	400	100.0
Marriage duration	1- 5	40	10.0
	6-10	237	59.3
	11-15	123	30.8
	Total	400	100.0

Table -01 shows demographic details for the sample of 400 participants. The table's rows are organized according to several demographic characteristics, and each gives the frequency (F) and relative percentage (%) of participants.

In the category "age of children who die" there are two main age ranges for children who pass away: 0 to 11 and 12-59 months. According to the table, 249 participants (62.3%) lost children between the ages of 0 and 11 months, while 151 people (37.8%) lost children between the ages of 12 and 59 months. In the age of respondents, the sample included 126 respondents (31.5%) who were between the ages of 25 and 34 and 274 respondents (68.5%) who were between the ages of 15 and 24. Moving on to the number of children, it is evident that individuals have various numbers of kids. In particular, 41 people (10.3%) had 1 to 5 kids, 236 participants (59.0%) had 5 to 8 kids, and 123 participants (30.8%) had 9 to 12 kids.

The information about mothers' educational background revealed that a sizable number of mothers were illiterate, with 317 participants (or 79.3%) falling into this category. Additionally, 74 participants (18.5%) had an elementary education, while only nine participants (2.3%) had a secondary education. While, father's education contains those 213 individuals, or 53.3% were determined to be illiterate, while others had varied degrees of education. To be more specific, 108 individuals (27.0%) had completed their primary education. A smaller proportion had completed their secondary education (58/ 14.5%), gained matriculation (12/3.0%), or even graduated (9/2.3%).

Section-B: Binary Regression and Qualitative Analysis

Demographic factors		deceased child age		OR	P. Value	C.I 95%	
		0-11	12-59			L	U
Mother education	Illiterate	203	114	.754	.005	1.250	3.611
	Primary	46	28				
	Middle	0	9				
Total		249	151				
Father education	Illiterate	114	99	-.436	.002	.489	.855
	Primary	90	18				
	Middle	36	22				
	Matric	9	3				
	Graduate	0	9				
Total		249	151				
Marriage duration	1- 5	13	27	. .840	.004	.398	.862
	6-10	153	84				
	11-15	83	40				
Total		249	151				

Hosmer and Lemeshow Test			Model Summary	
Step	Chi-square	Sig.	Method	Nagelkerke R Square
1	49.480	.000	Enter	.102

the findings of a binary regression analysis investigating the association between demographic variables and mortality among children under five (U5) in a dataset of 400 participants. With the use of the odds ratios (OR), p-values, and confidence intervals (95% C.I.) shown in this table, it is possible to comprehend how various demographic factors relate to U5 mortality. When mother education was examined, it was discovered that illiterate women have a higher risk of their children dying before age five (OR = 0.754, 95% C.I. = 1.250-3.611, p = 0.005). According to Gupta et al. (2018), this shows the crucial role that maternal education has in the health outcomes of children, as educated women are more likely to obtain better healthcare resources for their kids and make informed decisions. While, regarding fathers' educational level, fathers with elementary or no education have higher U5 mortality than those with higher education (OR = -0.436, 95% C.I. = 0.489-0.855, p = 0.002). As educated men promote maternal and child health practices, parental education is equally crucial for children's survival (Bashir, S., Zia, M. F., & Abrar,2020).

The results further show the duration of marriage that there is a meaningful relationship (p=.004) between the duration of marriage and U5 mortality. Mostly in the start years of the marriage, the partner was not

aware of the child's health and health-related care-related practices. While in after spending some years both partners become aware of the health care services. This shows that in this situation, the length of a couple's marriage does not directly influence the results for the child's survival but affects it up to some extent.

QUALITATIVE DATA ANALYSIS:

Mother Education

Education stands as a pivotal variable frequently invoked to elucidate health outcomes. This investigation delves into the correlation between the extent of parental education especially mother education and child mortality, drawing on the perspectives of healthcare experts intimately involved in child healthcare. The insights gleaned from these professionals are underscored by the following quotations:

In my experience, the impact of mother education on child mortality is profound. Educated parents are more likely to recognize warning signs, adhere to recommended health practices, and promptly seek medical care for their children. This has a substantial positive effect on child survival. (Doc#7female)

Mother education is indisputably interlinked with the rates of child mortality. One of the healthcare experts shared:

During the initial days of a child's life, their vulnerability is at its peak. What I've observed is that mothers with higher levels of education tend to have healthier pregnancies, make better choices for their newborns, and proactively seek neonatal care. These actions significantly contribute to improved child survival rates. (Doc#3 male)

Educated parents typically possess a deeper comprehension of child health practices, enabling them to make well-informed decisions that positively impact the health and survival of their children.

Education empowers mothers with essential knowledge about prenatal and postnatal care. Well-educated mothers are more inclined to follow healthcare guidelines, leading to the birth of healthier infants and a reduction in child mortality. (FGD R#6male Nurse FGD)

The promotion of parental education emerges as a fundamental strategy in the worldwide endeavor to diminish child mortality and provide every child with an opportunity to flourish.

I've encountered situations where basic knowledge about hygiene and preventive measures could have saved children's lives. Illiteracy and lack of awareness can pose formidable barriers to child health. I've distinctly observed a strong connection between parental education and child mortality. Parents with higher levels of education tend to possess greater awareness of child health practices, promptly seek medical attention when needed, and provide better care for their children. (Doc#1fe male)

The impact of mother education on the well-being and survival of infants and children has demonstrated its universal significance. Maternal education emerges as a crucial determinant influencing child mortality rates. As one of the participants expressed:

Parental education plays a significant role in influencing child mortality. Mothers with higher levels of education are more likely to make informed decisions regarding their children's health, and these decisions can be life-saving. (R#10 female nurse FGD)

This shows a clear association between levels of parental education and a decrease in child mortality.

DISCUSSION

The study revealed the critical role of mother education in influencing child mortality rates, highlighting the insights of healthcare professionals who have observed the profound impact of education on child health outcomes. Research in the field of maternal and child health consistently affirms the link between parental education and child mortality. The insights shared by healthcare experts in the passage align with existing literature. Educated parents are more likely to possess essential knowledge about prenatal and postnatal care, recognize warning signs of illness in their children, adhere to recommended health practices, and seek timely medical care when needed (Khan, A., Bashir, S., Bazai, P., & Rehman, 2023).). The quantitative results found that mother education was evaluated, and it was found that illiterate mothers have a higher chance of their children dying before the age of five (OR = 0.754, 95% C.I. = 1.250-3.611, p = 0.005). This demonstrates the critical role that maternal education has in the health of children, as educated mothers are more likely to get better healthcare

services for their children and make wise decisions. When it comes to fathers' educational level, however, fathers with elementary or no education had higher U5 mortality than those with higher education (OR = -0.436, 95% C.I. = 0.489-0.855, p = 0.002). Both parental education and the promotion of maternal and child health practices by educated males are essential for the survival of children.

This proactive approach to child healthcare significantly contributes to improved child survival rates, particularly during the vulnerable early days of a child's life. Furthermore, maternal education has been shown to have a direct impact on infant and child health. Educated mothers tend to have healthier pregnancies, make better choices for their newborns, and are more likely to engage in essential practices such as breastfeeding and vaccination (Kakar, & Bashir, 2023). These actions collectively lead to the birth of healthier infants and a reduction in child mortality rates. Illiteracy and lack of awareness can indeed pose formidable barriers to child health. This aligns with global efforts to improve child survival by addressing the social determinants of health, including education (UNICEF, 2019) As a result, the study underlines the indisputable link between parental education and child mortality. Educated parents are better equipped to make informed decisions regarding their children's health, and these decisions have a life-saving impact. The promotion of parental education emerges as a fundamental strategy in the global effort to reduce child mortality and provide every child with a chance to thrive.

is crucial for improving child health and well-being.

Multiple Regression Analysis

Earlier in this section, a bivariate analysis was initially conducted to assess the relationships between the selected independent variables and the variables representing U5 mortality in the research area. The bivariate analysis revealed a significant correlation between the independent variables and U5 mortality. However, real-life scenarios often involve the influence of multiple independent variables on the dependent variable, and therefore, a significant correlation in a bivariate analysis does not necessarily imply a meaningful causal relationship. To address this complexity, it is essential to perform a statistical analysis that considers multiple independent variables simultaneously. Multivariate analysis is the most suitable analytical approach, allowing for the investigation of the impact of various independent variables on a dependent variable while accounting for the effects of other independent variables (Tabachnick & Fidell, 2007). In this study, multiple logistic regressions were employed as the chosen form of multivariate analysis. This approach adjusts for the influence of various socio-demographic and socio-cultural variables, enabling an examination of how U5 mortality changes concerning the independent variable when accounting for their associations with other independent variables.

Table No: Multiple regression association of demographic and socio-cultural factors with U 5 Mortality (n=400)

Demographic and socio-cultural factors	1	2	3	4	5	6	7	8	9	10	11
	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR	OR
	CI	CI	CI	CI	CI	CI	CI	CI	CI	CI	CI
Mother education	1										
Father education	3.391	1									
	7.362										
Marriage duration	1.636	2.12	1								
	31.50	11.78									
Mother's age at the time of first birth	.755	2.67	1.67	1							
	.145	47.67	21.77								

Table No: Multiple regression association of demographic and socio-cultural factors with U 5 Mortality (n=400)

This table presents the results of multiple regression analysis examining the intricate relationships between various demographic and socio-cultural factors responsible for Under-5 (U5) mortality. Each factor is associated with Odds Ratios (OR) and corresponding 95% Confidence Intervals (CI). Notably, the mother's education shows an (OR=1.521, CI=12.56) suggesting a significant association with U5 mortality, consistent with prior research emphasizing the multifaceted nature of maternal education's impact on child health (Smith-Greenaway, 2013). Conversely, the father's education reveals a significant positive association with U5 mortality (OR = 3.391, 95% CI = 7.362), indicating that higher paternal education is linked to reduced U5 mortality, aligning with the recognized role of parental education in child well-being (Glewwe & Jacoby, 1995).

CONCLUSION:

This comprehensive study has illuminated a complex tapestry of factors that exert influence on child mortality rates and child health outcomes. The influence of maternal education on under-five mortality is seen in several research and situations. Higher levels of maternal education are consistently related to a significant decrease in under-five mortality rates, according to the research. Mothers with a higher level of education are more likely to engage in effective healthcare practices, use prenatal and postnatal care, and make educated decisions about their children's health. Positive effects extend beyond fundamental health treatments, including diet, institutional facility use, and adherence to suggested health practices. The findings highlight the importance of education in changing mother health knowledge, encouraging healthier behaviors, and eventually contributing to the well-being and survival of children under the age of five. As a result, investing in maternal education emerges as a viable option.

RECOMMENDATION:

1. Promote Maternal Education: Recognizing the strong correlation between maternal education and child mortality, there should be a concerted effort to encourage girls' education beyond the primary level.
2. The Department of Health and relevant authorities should develop strategies, policies, and intervention programs, such as health education initiatives tailored for uneducated mothers, who face a heightened risk due to limited healthcare utilization.
3. Maternal and Neonatal Care: Increase awareness of and accessibility to prenatal and postnatal care services to reduce maternal and neonatal mortality rates

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