

*Review Article*

Relationship Between Maternal Education And Under-Five Mortality Rate In Low And Middle Income Countries - A Literature Review

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ABSTRACT

Introduction: The attainment of mother's education has been rising significantly around the world. There has been ample information in low and middle income countries that argues mother's education has positive impact towards decrease of infant and child mortality rate. On an average, every one year increase in maternal education corresponds about 7-9% decline in under-five mortality rate (U5MR). Furthermore, a number of associations have been identified between maternal education and child mortality in many literatures. However, it is unknown about the true relationship between maternal education and U5MR. Thus, the current study examines the importance of U5MR in relation to maternal education and to undertake literature reviews to identify these associations in resource limited settings.

Methods: Three international data base such as Global health, Pubmed and Science direct have been identified for relevant literatures. Google scholar and United Nation's website has also been searched extensively for this purpose.

Results: The maternal education has a strong influence on under-five mortality than neo-natal and infant mortality rate. Since beginning, the research studies suggest that maternal education has unique importance in determining child health outcomes. After that, other studies from developing countries have argued a linear relationship between maternal education and child mortality. However, the current studies have questioned about the casual relationship between maternal education and child mortality.

Key words: Mother education, Infant mortality, Childhood mortality, under five mortality, South Asia and low income countries.

INTRODUCTION

In 2013, around 6.3 million children die (e.g. about 17,000 per day) before they reach fifth birth day. These deaths mostly occur in sub-Saharan Africa and South Asia.

^[1] The average global under five mortality rate (U5MR) has declined from 90 deaths in early 1990 to 46 deaths per 1,000 live births in 2013 which was a reduction of almost 50% globally. ^[1] This death was a cut in

almost half (i.e. from 12.7 million to 6.3 million), saving around 17,000 lives every day. ^[1] In Eastern and Southern Africa, the annual rate reduction of U5MR was 5.3% in 2013 and has managed to reduce U5MR by 55% since-1990. But still at high rates of mortality in these countries with one in every 13 children die before reaching age of 5. In West and Central Africa, there have been around 44% reductions in U5MR

between 1990 and 2013 with an annual reduction rate of around 3.8%. Still, it has been experienced with all most one in every eight children dying before the age of five. Further, in sub-Saharan Africa, around 48% decline in U5MR between 1990 and 2013 with an annual reduction rate of 4.2% has been noticed. ^[1]

Though, the global average of U5MR has been reduced (in sub-Saharan Africa, it is 48% decline in U5MR from 179 in 1990 to 92 in 2013, in West & Central Africa, it is 44% decline in U5MR from 197 in 1990 to 109 in 2013, in Eastern & Southern Africa, it is 55% decline U5MR from 165 in 1990 to 74 in 2013 and in South Asia it is 56% decline of U5MR from 129 in 190 to 57 in 2013) but still a significant challenge lies in Saharan Africa, South Asia, the Middle East and North Africa regions. ^[1]

These improvements of child survival were mainly due to the increment of mother's education and other proximate determinants. A variety of studies found that a uniform linear inverse relationship between mother's education and child mortality. ^[2] Moreover, the strength of association between maternal education and child mortality has been noticed stronger than other socio-economic variables such as father's education and house income. Also, the child survival rate is higher with the additional year of mother's education irrespective of the initial condition of mother such as her socioeconomic, cultural, primary health care etc.

However, the relationship between maternal education and child survival is so striking that it needs to be more explored. The objective of this paper is to recognize the importance of U5MR in relation to maternal education and identify the different associations that exist between maternal education with child survival and the impact of mother's education with child mortality

and other proximate determinant of child mortality.

METHODS

Literature search strategy

Different literatures were searched especially from Global health, Pubmed, Science direct, and United Nations websites. Firstly, the keywords maternal education was put in global health database followed by mother's education. When the keywords were searched in combination with 'OR' the search result was 984. Secondly, the keywords child mortality, childhood mortality and U5MR were searched combined with 'OR' and 1705 articles were found. Thirdly, the keywords developing countries, South Asia and low income countries were searched in combination with 'OR' and the result was 35643 articles. After that, when the selected 'OR' combinations were combined with 'AND', the final search result was 52 articles. Then, only those article were selected which possessed the most relevance with the proposed research topic. Subsequently, the abstracts were reviewed and few articles were identified for comprehensive reading. Then, full versions of PDF or full articles were searched in specific journal sites. In this way, from Global health 5 full articles were finalised. All articles after 1980 were taken into consideration without any specific year limit.

Likewise, the same procedures were followed for Pubmed and the final result was only 9 out of 28973 articles. After reading the abstracts 3 PDF were finalised for reading.

Lastly, when the keywords were searched through Science Direct, some articles were repeated as in Global health and Pubmed along with some other new articles. Finally, a total collection of around 14 articles published after 1980 were considered for final literature review.

Key definition

Under 5 Mortality Rate:

UNICEF defines 'it is the probability of dying between birth and exactly five years of age expressed per 1,000 live births'. This includes both infant and child mortality rates. ^[3]

RESULTS

Various studies have demonstrated a significant relationship between maternal education and child mortality in developing countries.

A study in Nigeria based on data from the World Fertility Survey in ten low income countries, Caldwell and McDonald has shown the importance of maternal education in reducing child under-five mortality. Their study argues that the mortality rate among the children with mothers having primary schooling, secondary and tertiary education are 20-50 %, 30-60 % and 60-90 % lower respectively than children of uneducated mothers. Further it elaborates that the impact of mother's education in declining child death is relatively higher than parental education. It has been successfully observed in countries like Srilanka and Bangladesh where child mortality is significantly lower because of mothers schooling. However, this study also states that father's education without mother's education has little impact on reducing child mortality. ^[4]

Cleland and Van Ginneken studied the paper of Cochrane et al. ^[2] with data from 33 countries and found a linear relationship between maternal education and childhood under-five mortality. There is about 7-9 % decline in child under-five mortality with each one year increment in maternal education. ^[5] Also a follow-up study done by Bicego and Boerma a work of Filipino children of central Philippines states that the probability of using preventive health services increases by about 4 %

during first year of life for every one year increase in maternal education. ^[6] Further, the study of Katherine and George about differential effect of mother's education on mortality of boys and girls in India found that there is a reduction in mortality of all children below five years irrespective of sex with improved mother's education. ^[7]

Also, Buor revealed that higher education of mother influences lower childhood mortality except neonatal mortality and infant mortality. It shows that the neonatal and infant mortality rate among children of mothers having primary education is more in comparison to those with no education. So this study concluded that there is a strong inverse relationship between education of mother with childhood mortality. ^[8] A small study in Indonesia conducted by Streatfield et al illustrates that educated mothers are more aware about correct immunization schedules. On the other hand the study also says that specific knowledge about vaccine and immunization are of more importance than formal education for better child health as well as declining childhood mortality. ^[9] Also the outcome of Rozenzweig and Schultz with census data for urban Columbia ^[10] and Bicego with survey data of rural Hiati, ^[11] recommend that even if mother's education is compromised still better access to health services enhances child survival significantly, thereby constricting the effect of education.

The results from ecological studies of China and Costa Rica are also consistent with the previous study of Bicego and Boerma. ^[6] It argues that improved physical access to health services narrows the effect of education differential on childhood mortality. Likewise, a comprehensive study of Latin American countries has demonstrated a greater availability of basic amenities and services are more important than individual assets and characteristics

(e.g. maternal education) which was cited by Bicego and Boerma. [6] Similarly, in Pakistan Agha studied that child health may improve with increased mother's education as the educated mother may practice more effective preventive and curative health care measures. Her education may contribute to fertility factors like child spacing and birth order. The significant factor is the maternal age which plays vital role in reducing child mortality. [12]

Also Bicego and Boerma in their study of 17 countries found that increase in childhood mortality was associated with low or no education. The gross educational effect and the statistical difference between mother's education and childhood mortality were found to be very low. Only 6 countries have shown a significant gross educational effect and the countries like Colombia and Thailand have a low mortality rate due to greatest educational gross effect. However, this cross country study revealed that in countries like Togo, Ghana and Senegal, even the mother's having lower education also presented low risk of neonatal death. This unusual finding may be due to error in neonatal death records and misreporting which genuinely happens with mothers without education. Moreover, this study concluded that lower level of education in mothers has greater influence on death of children during first two years of life. Mortality risk is more than twice during 1-23 month period as compared to neonatal phase due to education effect. The study also concluded that the education plays significant role in only 5 out of 17 countries after controlling economic status. [6]

Desai and Alva, by analysing the study conducted in 22 developing countries revealed that in each individual and community level factor considerably weaken the maternal education on stunting and infant mortality. So by controlling other factors like parental education, residency,

piped water and toilet facilities attenuate the influence of maternal education by 67 %. Thus, the author concluded by arguing mother's education can act as a 'Proxy for socio-economic status of the family and geographic area of residence' (p. 71). [13]

Another study in Nigeria, Adetunji noted that there is an inverse relationship between maternal education and childhood mortality and this relationship is found to be stronger in childhood than infancy. Further, it emphasises no statistical significance has been found between mother's education and infant mortality which does not ensure an inverse relationship. [14] Also, Adetunji have reviewed the work of Nigeria Demographic and Health Survey (1990) and found that the mothers with primary education had slightly higher risk of infant mortality than those with no schooling. Additionally, infants of mothers with partial secondary education had nearly similar risk of mortality as mother without schooling. [14] Further, Feyisetan conducted a study in Ile-Ife, Nigeria illustrated that less educated mother had lower infant mortality than children of women with secondary or higher education. [15]

Similarly, in a study in India, Basu and Stephenson stated that there were negative correlation between maternal education and odds of child mortality. They noted that for those women who had not completed the primary education, the odd ratio (OR) for early post-natal period was 0.83 and late post-neonatal period and toddler was 0.56, whereas those with completed primary education the OR was 0.70 for early post- neonatal and 0.68 for late post-neonatal and toddler in comparison to illiterate women. Thus, lower odds of child mortality were found in all the cases. Also, between the illiterate women and incomplete primary educated mothers, there was no significant difference between the odds of mortality among neonatal group.

Further, the study shows, women who completed primary schooling also had lower odds (OR 0.82) of neonatal mortality than illiterate women. Thus, the study concluded that though little education is the protective factor against mortality between ages 1-24 months, but there is no such positive effect on neonatal mortality even if mother has small amount of education. [16]

DISCUSSION

The findings of Caldwell and McDonald stated that maternal education and child mortality are strongly associated with each other and mother's education is important in reducing child mortality. [4] This finding is supported by Cleland and Ginneken [5] followed by Bicego and Boerma [6] arguing that for every one year increment in maternal education reduces childhood mortality. The study done by Katherine and George had also similar findings stating that education of mother declines mortality at all levels of childhood. [7]

Also, Desai and Alva found that maternal education had strong influence on health seeking behaviours such as immunization, whereas environmental factors play more vital role for nutritional status and child survival outcome. [13] Furthermore, many studies have argued that increased physical access to health facilities decreases child mortality even without mother's education. [10,11]

On the other hand, Adetuniji [14] and Basu and Stephenson [16] revealed that there is no inverse relationship between low maternal education and infant mortality. This argument is also supported by Buor [8] stating that mothers with primary education have higher neonatal and infant mortality than those of no education.

Since beginning, research studies suggest that maternal education has unique importance in determining child health

outcomes rather than parental education, health service availability and socio-economic status. [4,17] Further many comparative researches in third world countries have illustrated a linear relationship between maternal education and childhood mortality. [2, 5,17] However, recent studies question the casual association between maternal education and child health outcomes. [13,17]

CONCLUSION

The evidence revealed that there is an inverse relationship between mother's education and child death. However, it may be concluded that maternal education is strongly related with U5MR except neonatal and infant mortality which are more affected by socio-economic status. However, it can be suggested that under specific circumstances with adequate resources maternal education play significant role in promoting health seeking behaviour and effective utilization of health services.

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