

Major factors responsible for child malnutrition: A review

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Abstract

Pakistan is one of the countries in which children suffer from malnutrition, and problems of stunting, wasting and under-weight are common among children. The narrative review was planned to examine published research on child malnutrition, factors associated with malnutrition, gender discrimination regarding nutrition and their related outcomes. Studies included were those based on data related to child malnutrition in Pakistan. Total 12 articles from the preceding five years were reviewed to assess the nutritional status prevailing in Pakistan. Most of the studies used the World Health Organisation z-scores for the assessment of stunting and wasting. Majority of the studies had a cross-sectional design. Other studies conducted in South Asian countries were also used to make a comparison and to see if the prevalence of child malnutrition and the factors associated with malnutrition were the same as in Pakistan or not. It was concluded that maternal health and maternal education were the most important factors for enhancing the probability of child malnutrition. No gender difference existed in terms of child malnutrition. Economic conditions and financial status of the family played an important role in child malnutrition.

Keywords: Child health, Malnutrition, Maternal health, Growth disorders.

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Introduction

Proper and adequate diet is necessary for healthy immune system and physical and mental development of children. It is therefore necessary to pay attention to nutrition. Under-nutrition or malnutrition simply means inadequacy of healthy diet. Malnutrition plays a significant role in worldwide childhood deaths.¹ Generally, under-developed and developing countries face the problems of malnutrition.² About 96% children in Pakistan do not get proper diet, such as soft food, milk, fruit and vegetables etc., in early childhood.³ It was

estimated that globally, 30% of children aged five years or less are stunted and 19% are wasted.⁴ Child's health plays a vital role in the socio-economic development of a country. Pakistan is one of the countries where prevalence rate of malnutrition is high.⁵ It has been estimated that in Pakistan 428 out of every 100,000 deaths of children aged <5 years are credited to malnutrition.⁶ Malnutrition results in deficiency of vitamin A and iron-deficiency anaemia and hence, become the cause of stunting, which is less height relative to age, and wasting, which is less weight relative to height. The major factors for child malnutrition observed by the United Nations Children's Fund (UNICEF) are food insecurity and unhealthy environment, inadequate care and absence of healthcare facilities.^{7,8} There are several other factors that can affect the nutrition status of a child, including poor or low income, illiterate family or parent, knowledge about the use of healthcare facilities etc.

The problem of malnutrition is a burden on South Asian countries India, Pakistan and Bangladesh as more than half of children affected by malnutrition live in the region.⁹ As reported by the National Health Survey, the prevalence rate of stunting is 30-40% and it is 14% for wasting in Pakistan.¹⁰ The two emerging factors responsible for stunting and wasting are poverty and illiteracy in Pakistan.¹⁰ The prevalence rate of child malnutrition is higher in Sindh compared to other regions of the country.⁶ The current narrative review was planned to examine the factors that played a significant role in malnutrition, prevalence of malnutrition in various regions, comparison of prevalence in rural and urban areas, and gender discrimination related to nutrition and to provide recommendations that may form the bases for future research.

Methodology

Different statements regarding child malnutrition or stunting and wasting in Pakistan were used to gather relevant literature. Studies included for review related to 2015 onward and contained data from Pakistan. Geographical regions in which the research was conducted were also analysed. Some studies used secondary data from the Pakistan Demographic and Health Survey (PDHS)⁶ and some used primary method of questionnaire to obtain data from various big and small

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towns of Pakistan. It was seen that studies had used body mass index (BMI) of children by taking weight and height into consideration for the assessment of malnutrition. Also used were mid-upper arm circumference (MUAC) and the World Health Organisation (WHO) z-scores for stunting, including height for age (HAZ) stunting, underweight (WAZ) and weight for height (WHZ) wasting.

Research articles were also selected by considering geographical regions. PDHS provides data covering all the four provinces. Total five studies collected data from Sindh, two each used data from Balochistan and Punjab, and one from Khyber Pakhtunkhwa (KPK).

Gender Differences

Gender is also an important aspect to pay attention to when assessing child malnutrition. Literature indicated that there was no significant relation between malnutrition and gender.^{11,12} There may be a chance of girls getting more stunted and wasted due to their physiological structure. The occurrence of severe malnutrition was found higher in female child compared to male children.¹¹ Usually male children need more calories for development and growth so they are more vulnerable of being stunted and wasted.¹³

Child Age

All the 12 studies reviewed demonstrated child malnutrition and under-nutrition on a specific age group (Table). Primary school students, children aged 05-14 years, 10-14 years and those aged <2 years were used by separate studies. Four articles each had children aged 06-59 months and 0-59 months. The prevalence rate of severe child malnutrition was found in those aged <5

years.^{11,12} The prevalence rate of stunting, underweight and wasting was observed as moderate among children aged <2 years.⁶

In some South Asian countries, the prevalence of underweight was observed to be higher among children aged 7-12 months compared to those aged <6 months.^{14,15}

Discussion

Malnutrition is a common problem in most developing and under-developed countries. Malnutrition includes under-weight, feeling of weakness and low energy level among children, improper growth and less interest in eating and drinking.¹⁶

It was observed that inadequate diet is the risk factor for child malnutrition.¹⁷ Low consumption of vitamin A, and iron deficiencies are responsible for stunting and wasting.⁶

Several other factors, such as maternal health, also played an important role in child malnutrition. Intake of iron supplements during pregnancy have significant role in child malnutrition.⁶ Significant association of maternal health was found with child malnutrition.¹⁷ BMI of mother was also a risk factor for child malnutrition.¹³ Other maternal factors were also associated with malnutrition.¹³ Not only maternal health, but mother's age and education must also be taken into consideration. Prevalence rate of stunting was observed to be higher with teenager mother.⁶ Mother's age at the time of marriage was also shown to be associated with child malnutrition.¹³ Significant relationship was observed between malnutrition and mothers education.¹² Educated mothers

Table: List of articles reviewed.

Articles	Subjects	Number of participants	Assessment of Malnutrition	Geographical Region
Laghari et al. (2015) ¹¹	Children	511	MUAC	Shanghar, Sindh
Ali et al. (2015) ²⁰	Parents & Child	446	WHO z-scores	Nowshera, KPK
Khan et al. (2015) ²¹	School going	684	WHO z-scores	Bahawalpur, Punjab
SMART (2016) ³⁵	Mother & Child	415	MUAC	Umerkot, Sindh
Mehmood et al. (2016) ¹²	Guardian	100	WHO z-scores	Rawalpindi, Punjab
Khan et al. (2016) ²³	Children	3964	WHO z-scores	Thatta and Sujawal, Sindh
Achakzai and Khan (2016) ¹⁷	Children	104	WHO z-scores	Quetta, Balochistan
Zainab and Kadir (2016) ²²	Children	385	BMI	Karachi, Sindh
Mustufa et al. (2017) ³⁶	School going	6363	BMI	Lasbela, Balochistan
Tariq et al. (2018) ⁶	Children	984	WHO z-scores	Pakistan (PDHS)
Qureshi et al. (2019) ¹⁶	Children	106	MUAC	Kotri, Sindh
Khan et al. (2019) ¹³	Children	3071	WHO z-scores	Pakistan (PDHS)

BMI: Body mass index

MUAC: Mid-upper arm circumference

WHO: World Health Organisation

PDHS: Pakistan Demographic and Health Survey.

usually have more exposure to media, and they have a broad social circle.¹⁸ Mother's education has more effect compared to father's education.¹⁹

Mother's knowledge about follow-up after delivery can also enhance the risk of being stunted. Association of child malnutrition was observed with inadequate feeding status.¹⁶ Children who were not exclusively breastfed were found to be at more risk of being stunted and wasted.²⁰ Attention must be paid towards vaccination of the child. Education of mothers also played a role here. It was observed in a study that usually children do not receive any vaccination except polio.²⁰ Number of children also affects child malnutrition.²¹ Usually at first, the elder child is the only one in whom parents make all the investments. Then the attention of the mother gets diverted with the arrival of subsequent children. In such a situation, one of the elder or younger child is at risk of developing malnutrition. The younger child is significantly at more risk.¹¹ Significantly, child's age and stunting are related. This is may be due to the fact that stunting is a chronic malnutrition, so the older child suffers for a longer duration compared to the younger one (Table).²² Family system also matters in terms of child malnutrition. Child in a joint family system is observed at high risk. Women living in nuclear family find themselves more empowered compared to women living in a joint family.²¹ Child malnutrition in joint families is associated with gender. Mostly in joint families, boys are dearer to the parents.²¹

Financial status also affects child malnutrition. Poor and unhygienic food is responsible for malnutrition. That is why the prevalence rate is higher in developing and under-developed countries. Mostly those children suffer from malnutrition who belong to a low-income family. Household and economic conditions are also associated with child malnutrition.²³ Place of residence and wealth index was observed to be associated factors for child malnutrition.¹³ Significant association of such socio-demographic variables was seen with stunting and wasting.¹⁷ Stunting, wasting and under-weight are associated with household wealth.²³

It was observed that no significant difference exist across child malnutrition.¹¹ The place of residence was significantly associated with malnutrition. Children living in rural areas were at most risk of developing child malnutrition. This is perhaps due to the fact that the child living in urban area enjoys better socio-economic status and avails better health facilities. Moreover the literacy rate of rural area is quite low which enhances gender discrimination. The female child living in rural area has higher chances of becoming victim to child

malnutrition.²¹

Malnutrition in South Asia

Malnutrition is a major issue in South Asia where economic conditions are poor and resources are limited. Wealth index has always been an important factor playing a role in child malnutrition. The wealth index was negatively associated with malnutrition and the risk of being malnourished was higher among poor children.²⁴ Economic status, social status and national per capita income were also considered to be associated with child malnutrition.²⁵

Children who had suffered from diarrhoea in the past were found to be malnourished or underweight.¹⁴ Statistically significant relation was observed between child's nutritional status and diarrhoea status.²⁶ Malnourished child had low resistance against infectious diseases, like diarrhoea or respiratory infection.²⁷ They usually have more probability of dying and those who survive will suffer from frequent cycle of recurring illness.²⁷

Not only in Pakistan but in other South Asian countries as well the effect of mother's education was somewhat significant.¹⁵ Maternal literacy was considered an important factor contributing towards child malnutrition.²⁷ Educational status of mother had prominent effect on nutritional status of children.¹⁴ More than half the proportion of mothers of malnourished children did not have adequate knowledge regarding the diet requirement of the child and nutritional value of food items.²⁷ Mothers with education up to secondary level were likely to have a malnourished child.²⁶ Infant feeding practices were highly associated with wasting. This association was not significant in studies conducted in Ethiopia, India, Kenya, Uganda and Zimbabwe.^{28,29} However, benefits were well established for the survival and development of children.^{30,31}

Family size and household economic status did not have effect on chronic malnutrition, but it exerted its effect on acute malnutrition.¹⁵ Size of household affected malnutrition in other South Asian regions with resource constraints. Usually children having three or more siblings were exposed to malnutrition compared to children with smaller families.¹⁵ Rural-urban disparity also existed in nutritional status of children.³² These disparities were due to the differences in the economic level and inaccessibility of health and educational facilities.²⁴ It can be assumed that children living in rural areas were more vulnerable to malnutrition, but in a study conducted in Bangladesh children from urban areas were more stunted.²⁴ In Pakistan, we observed that children from

rural areas were victims of malnutrition.²¹ Economic status, maternal education and spouse education contributed more to the rural-urban disparity compared to the age and working status of mothers.³² Not only mothers' education but fathers' educational level was also considered a vital factor. Father's education contributed to decision-making regarding the selection of food for family.²⁴ Bringing up the educational level of father had great impact on child malnutrition in Nepal and Bangladesh.³²

Another characteristic observed in resource-constraint regions of South Asia is the type of fuel used for cooking. Mothers who cooked food with wood instead of gas or electricity were more likely to have malnourished children.²⁶ In South Asia, programmes for complementary food and feeding are needed for the prevention of child wasting.³³ Pakistan is suffering from child malnutrition due to the unavailability of hygienic food. Iron deficiency may be a cause of child malnutrition. In regions of South Asia where fish (15% iron absorbed) is often a part of a meal, iron deficiency will probably not be a general problem.³⁴

Conclusion

It was observed that malnutrition is a major problem compared to obesity and underweight. There is need for proper healthcare facilities to avoid risk factors that enhance the probability of being a victim of malnutrition. Mothers must follow the dietary pattern prescribed by the doctors during pregnancy and also must visit doctors for follow-up after delivery. Like in other South Asian countries, Pakistan should promote educational seminars regarding parental education.

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