

Risk Factors of Malnutrition in under 5 Year Children Admitted at DHQ Teaching Hospital, Dera Ghazi Khan

SHAKEEL AHMAD¹, TAYYABA RAFIQUE², NUSRAT HUSSAIN³, ASMA AKBAR⁴

ABSTRACT

Background: Malnutrition is a disorder resulting from not having enough food or enough of right food, for a long time. It is associated with more than 50% of all childhood mortality in developing countries with the risk of mortality being 5 – 8 folds among severely compared to moderately malnourished children. Child mortality continues to be a public health priority worldwide. In Pakistan it is estimated that nearly 40% to 50% of children under 5 years are stunted, 12% severe underweight, 13% moderate to severely wasted.

Aim: To determine the factors leading to malnutrition in children 6 months to 5 years of age admitted in Teaching Hospital Dera Ghazi Khan.

Study design: Cross sectional survey

Setting: Department of Pediatrics, Teaching Hospital, Dera Ghazi Khan.

Duration of study: Six months from 01-01-17 to 30-06-17.

Sample size: The sample size was calculated to be 200 using standard WHO formula for sample size calculation.

Sampling technique: Non-probability consecutive sampling.

Data collection procedure: 200 patients fulfilling the inclusion criteria were selected from indoor Pediatric Medicine department of Teaching Hospital Dera Ghazi Khan. After taking informed consent of parents their bio-data including name, age, sex and addresses were recorded.

Results: There were 200 patients in total. Males were 115(57.5%) whereas females were 85(42.5%). Mean age of the patients was 28.65±15.34 months, mean weight was 12.05±2.57kg and mean for percentile of weight for age was 32.20±27.05. When the frequencies of various risk factors were evaluated it was found that delayed weaning (> 6 months later) was present in 77(38.5%) of the patients. Low maternal education where mother was not even primary was present in 82(41%) of the patients. There was lack of proper vaccination in 52(26%) of the patients. Larger family size with > 2 kids younger than 5 years was identified in 97(48.5%) and under-feeding with < 2 bottles per day feeding was identified in 147(73.5%) of the patients. No significant effect of age or gender was found on the frequencies of various risk factors of malnutrition in the study population.

Conclusion: Malnutrition is a commonly encountered problem in our setting and the most commonly responsible risk factors include under-feeding and larger family size followed by low maternal education, delayed weaning and lack of vaccination.

Keywords: Risk factors, Malnutrition, Stunting, Underweight, Wasted.

INTRODUCTION

Malnutrition is a pathological condition resulting from deficiency of one or more nutrients and has a wide range of clinical manifestations¹. Child nutritional status is an essential component of a country's overall human development. Preschool children are in the developmental stage (functional) of life, any impairment in their growth can reduce physical, mental and intellectual potential². Child malnutrition is the single biggest contributor to under-five morbidity and mortality³.

Based on the NCHS/WHO reference, overall prevalence estimates of underweight, wasting and stunting were 17.8%, 7.4% and 10.9% compared to 11.3%, 7.6%, and 13% respectively calculated according to the WHO 2006 reference⁴. In 2001, it was noted that malnutrition caused 54% deaths in children living in developing countries⁵. The World Health Organization through the Millennium Development Goal 4 has recognized that

^{1,4}Assistant Professor of Paeds medicine, Ghazi Khan Medical College, Dera Ghazi Khan.

²Consultant Gynecologist, THQ Hospital Kot Chutta, Dera Ghazi Khan.

³Senior Registrar, Paeds Medicine, Nishtar University, Multan

Correspondence to Shakeel Ahmad,

Email: dr_leghari190@yahoo.com Cell: 0333-6105065

improved nutrition is crucial in reducing the under-5-years mortality, especially in the developing countries⁶. In Pakistan, malnutrition is present in 50-60% of children⁷. The prevalence of underweight children was 29.7%, stunting was 16.7% in the National Health Survey of Pakistan (NHSP)⁸.

Studies conducted in developing countries have identified several risk factors of under nutrition which are food unavailability, poor infant feeding practices, poverty, low maternal intelligence, low parental education, maternal depression, rural residential area, short previous birth interval, parents having many children under five years and older age of infant, low socioeconomic status of household and lack of immunization. Low maternal nutritional knowledge is the key determinant of growth faltering⁹.

According to one study conducted in Pakistan, 8.4% of mothers started exclusive breast feeding while pre lacteal use was seen in 31.6%. Around 21% of 2-3 months old babies received complementary food and 19% of 6-8 month-olds were only breastfed¹⁰.

In another study, most significant risk factors leading to malnutrition in children were bottle feeding (present in 70% of children), followed by large family size (39% of cases with >2 children and 29% of cases with >5 children), delayed weaning (27.6%), early weaning (8.4%),

uneducated mothers (23.2%), lack of immunization (23%), history of measles (20%), LBW (2.2%), and prematurity (10.4%)¹¹

MATERIAL & METHODS

Two hundred patients fulfilling the inclusion criteria were selected from indoor Pediatric Medicine department of Teaching Hospital, D.G. Khan. After taken informed consent of parents their biodata name, age, sex and addresses were recorded. The detailed history of risk factors of malnutrition in children i.e., weaning started at more than 6 months of age, maternal education less than 5 class, lack of vaccination (according to extended programme of Immunization of Pakistan), large family size i.e. number of children more than 2 under 5 years of age, under feeding i.e. less than two bottles per day will be taken. All the information was taken from mother, if mother was not available then information was taken from father of a patient. All these information were obtained on a specified proforma.

RESULTS

There were 200 patients in total. Males were 115 (57.5%) whereas females were 85(42.5%) (Graph 1). Mean age of the patients was 28.65±15.34 months ranging from a minimum of 6 to a maximum of 60 months. Mean weight was 12.05±2.57 kg ranging from a minimum of 7 to a maximum of 20 kg. Mean for percentile of weight for age was 32.20± 27.05 (Table 5).

When the frequencies of various risk factors were evaluated it was found that delayed weaning (> 6 months later) was present in 77(38.5%) of the patients. Low maternal education where mother was not even primary was present in 82 (41%) of the patients. There was lack of proper vaccination in 52 (26%) of the patients. Larger family size with > 2 kids younger than 5 years was identified in 97 (48.5%) and under-feeding with < 2 bottles per day feeding was identified in 147 (73.5%) of the patients (Graph 2).

When the effect of gender was noted on the frequencies of various risk factors it was found that among 85 females mean age was 26.14±16.35 months, mean weight was 11.72±2.91 Kg, mean for percentile of weight for age was 35.11±27.47. Among 115 males, mean age was 30.50±14.33 months, mean weight was 12.30±2.26 Kg and mean for percentile of weight for age was 30.04±26.65. Delayed weaning was found to be present 32/85 (37.65%) females as compared to 45/115 (39.13%) with a p-value of 0.884. Low maternal education was found to be present in 35/85 (41.1%) females as compared to 47/115 (40.86%) male children with a p-value approaching 1.000. Lack of vaccination was present in 27/85 (31.7%) females as compared to 25/115 (21.7%) males with a p-value of 0.142. Larger family size was identified in 44/85 (51.7%) females as compared to 53/115 (46%) males with a p-value of 0.475. Under feeding was identified in 61/85 (71.7%) females as compared to 86/115 (74.7%) males with a p-value of 0.631 (Graph 3).

Graph 1: Gender distribution in the patient population.

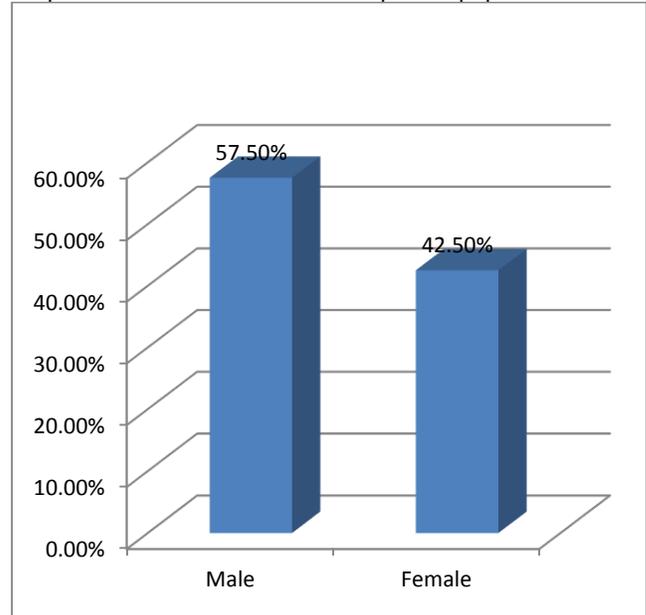


Table 1: Characteristics of the study population

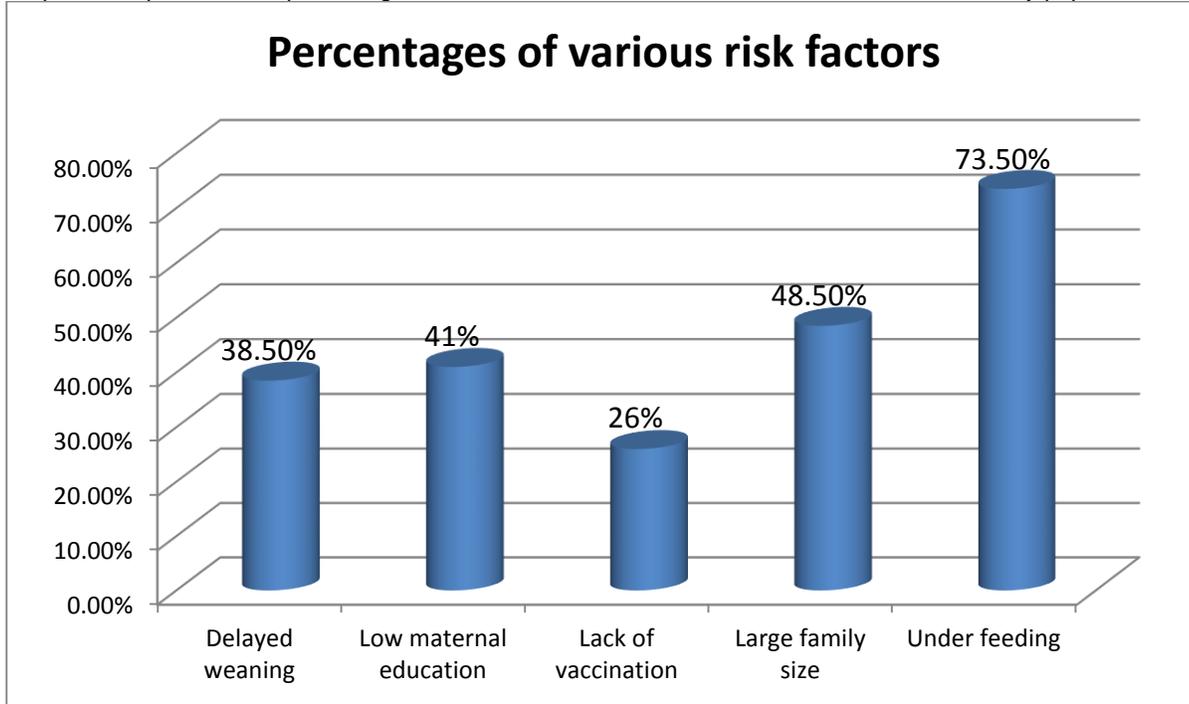
Total patients	200
Males	115(57.5%)
Females	85 (42.5%)
Mean age (months)	28.65±15.34
Mean weight (Kg)	12.05±2.57kg
Mean percentile of weight for age	32.20±27.05

When the effect of age was noted on the frequency of various risk factors it was noted that in age group it was noted that in age group 6 months to 20 months, there were 70 patients in total, males were 35/70 (50%) while females were 35/70 (50%), mean weight was 9.56±1.32 Kg while mean percentile of weight for age was 36.39±26.28. In age group 21-35 months there were 62 patients in total, males were 33/62 (53.2%) while females were 29/62 (46.8%). Mean weight of the patients was 12.21±1.27 while mean percentile of weight for age was 32.98±27.04. In age group > 35 there were 68 patients in total, males were 47/68 (69.12%) while females were 21/68 (30.88%). Mean weight was 14.48± 1.95 while mean percentile of weight for age was 27.16 ± 27.40. Delayed weaning was found in 25/70 (35.71%) patients in age group 6-20 months, it was present in 28/62 (45.16%) patients in age group 21-35 months and 24/68 (35.29%) patients in age group > 36 months (p-value = 0.430). Low maternal education was found in 26/70 (37.14%) patients in age group 6-20 months, 25/62 (40.32%) patients in age group 21-35 and 31/68 (45.59%) patients in age group > 35 (p-value = 0.596). Lack of vaccination was present in 16/70 (22.85%) patients in age group 6-20 months, 15/62 (24.19%) in age group 21-35 months and 21/68 (30.88%) patients in age group > 35 months (p-value=0.520). Large family was present in 31/70

(44.29%) patients in age group 6-20 months, 30/62 (48.38%) in age group 21-35 and 36/68 (52.94%) in age group > 35 (p-value=0.596). Under feeding was identified in 49/70 (70%) patients in age group 6-20 months, 43/62

(69.35%) patients in age group 21-35 months and 55/68 (80.8%) patients in age group > 35 (p-value = 0.236) (Table 2).

Graph 2: Frequencies and percentages of various risk factors of malnutrition identified in the study population.



Graph 3: Effect of age on the frequencies of various risk factors for the study population.

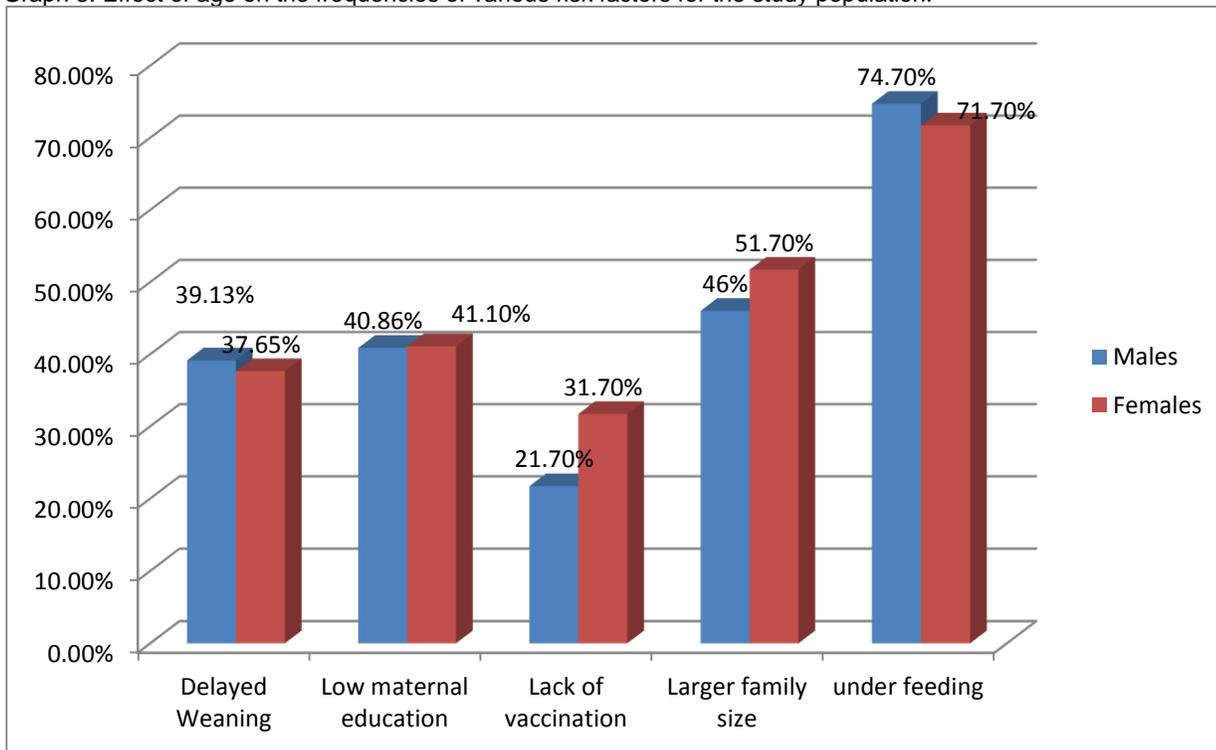


Table 2: Effect of age on the frequencies of various risk factors among different age groups.

Characteristic		Age 6-20 (n=70)	Age 21-35 (n=62)	Age > 35 (n=68)	P-value
Delayed weaning	Present	25	28	24	0.430
	Absent	45	34	44	
Low maternal education	Present	26	25	31	0.596
	Absent	44	37	37	
Lack of vaccination	Present	16	15	21	0.520
	Absent	54	47	47	
Large family	Present	31	30	36	0.596
	Absent	39	32	32	
Under feeding	Present	49	43	55	0.236
	Absent	21	19	13	

DISCUSSION

Malnutrition is an important indicator of child health. A significant contributing factor to infant and child mortality, poor nutritional status during childhood also has implications for adult economic achievement and health¹². While known to be a major public health problem in low-income countries, childhood malnutrition is also present in middle-income countries, particularly among marginalized populations. Anthropometric indicators that are commonly used to measure malnutrition in a population are stunting, wasting, and underweight. Stunting (extremely low height-for-age) represents cumulative growth and is an indicator of past or chronic malnutrition or illness. Wasting (extremely low weight-for-height) is an indicator of current nutritional status. Underweight (extremely low weight-for-age) reflects both low height-for-age and low weight-for-age and therefore reflects both cumulative and acute exposures¹³.

In our study, there were 200 patients in total with a slight males predominance as 115(57.5%) were males whereas females were 85(42.5%). This was in slight disagreement with the current available data which suggests that female children are more prone to have malnutrition and are usually affected more severely. One Bangladeshi study attempted to study the gender inequality in nutritional status and the effects of various socioeconomic, demographic, and health-programme factors on gender inequality in a remote rural area of Bangladesh. Measurements of mid-upper arm circumference (MUAC) were taken from 2,016 children aged less than 5 years (50.8% male, 49.2% female) in 1994. Children were characterized as severely malnourished if MUAC was <125mm. Independent variables included various characteristics of children, households, and mothers. Average MUAC for all children was 130mm; 33% were severely malnourished. Of the severely-malnourished children, 54.2% were female, and 45.8% were male. The gender gap persisted in the multivariate situation, with female 1.44 times more likely to be severely malnourished. This was possibly because our study was conducted in a hospital setup in which children were brought by the parents and there is an unfortunate dilemma in our society that male children are given more importance and care as compared to the females.

Mean age of the patients in our study was 28.65±15.34 months ranging from a minimum of 6 to a maximum of 60 months. Mean weight was 12.05±2.57 kg ranging from a minimum of 7 to a maximum of 20 kg. Mean for percentile of weight for age was 32.20±27.05. These are all reflective of the inclusion criteria in which we selected

patients in age range 6 months to 5 years and those with weight for age percentile below 80% of the normal. When the frequencies of various risk factors were evaluated it was found that under-feeding with < 2 bottles per day feeding was the most frequent risk factor identified in 147(73.5%) of the patients. This reflects that major cause in our setup is poor feeding which is an indirect reflection of the lower socioeconomic status these families suffered from. Second most frequently identified risk factor was larger family size with > 2 kids younger than 5 years which was identified in 97(48.5%) of the malnourished children. Larger family size can be responsible for lack of attention towards the children as the younger child seeks more attention and care. It may also reflect that in a poor socioeconomic status, more children decreases the chances of a better feeding of the child resulting in malnutrition. Next most frequent risk factor was lower maternal education which was present in 82 (41%) of the patients followed by delayed weaning (> 6 months later) which was present in 77 (38.5%) of the patients. These two are probably interlinked and suggest that poor maternal understanding of the importance of weaning can lead to malnutrition of the children. The last and least frequent risk factor was lack of proper vaccination which was present in 52(26%) of the patients. These findings were consistent with data from other studies. Like in one Pakistani study conducted in rawalpindi, which aimed to determine the risk factors for malnutrition among children presenting in outpatient department of Railway Hospital, IIMCT, Rawalpindi, studied 500 patients. It was found that children were of the age ranging from 2 months to 12 years, out of which 60% were female and 40% were male. Most significant factors were bottle feeding (present in 70% of children), followed by large family size (39% of cases with > 2 children and 29% of cases with >5 children), delayed/early weaning (36%; 27.6% - delayed weaning, 8.4% early weaning), uneducated mothers (23.2%), lack of immunization (23%), history of measles (20%), LBW (2.2%), and prematurity (10.4%)¹¹.

When the effect of gender was noted on the frequencies of various risk factors it was found that mean age and mean weight were lower among females than males with females having a mean age of 26.14±16.35 months and mean weight of 11.72±2.91 Kg as compared to that for males which had a mean age of 50±14.33 months and mean weight of 12.30±2.26 Kg. On the other hand mean for percentile of weight for age was slightly higher in females with a value of 35.11±27.47 as compared to males with a value of 30.04±26.65. Delayed weaning and under feeding were found more frequently among male children

with frequencies of 39.13% and 74.7% as compared to females having frequencies of 37.65% and 71.7% respectively. However, the difference was statistically non-significant with a p-value > 0.05. Low maternal education, lack of vaccination and larger family size were observed more frequently among females as compared to males but the difference was again statistically non-significant.

When the effect of age was noted on the frequency of various risk factors it was noted that in age group 6-20 years the most frequent risk factors were under-feeding (70%), large family size (44.29%), low maternal education (37.14%), delayed weaning (35.71%) and lack of vaccination (22.85%). In age group 21-35 months the most frequent risk factors were under-feeding (69.35%), large family size (48.38%), delayed weaning (45.16%), low maternal education (40.32%) and lack of vaccination (24.19%). In age group > 35 months, the most frequent risk factors were under feeding (80.8%), large family (52.94%), low maternal education (45.59%), delayed weaning (35.29%) and lack of vaccination (30.88%). However, the differences were statistically non-significant with a p-value > 0.05.

CONCLUSION

Malnutrition is a commonly encountered problem in our setting and the most commonly responsible risk factors include under-feeding and larger family size followed by low maternal education, delayed weaning and lack of vaccination. These areas should be focused and minimized in the community to prevent the problem of malnutrition in our country.

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