Original Article

Under-Nutrition Among Children Under Five Years

Socio-Demographic and Child Caring Factors Responsible for Under-Nutrition among Children between 6-59 Months in Sindh, Pakistan

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ABSTRACT

Objective: To determine the association between socio-demographic and child related factors with under-nutrition among children having age between 6-59 months in Hyderabad, Sindh.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Pediatric department, Liaquat University Hospital Jamshoro from August 2020 to February 2021.

Materials and Methods: Children belongs to either gender, aged between 6–59 months were included. Socio-demographic profile of child as well as parents and child's caring practices was recorded using a semi-structured written questionnaire.

Results: Total 384 children included while mean age of participants was 24.4±11.4 months. Prevalence of stunting, wasting and underweight were 52.6%, 17.2% and 30.2% respectively. A statistically significant association ($p<0.05$) between different factors with the nutritional status of children include child age, birth order, diarrheal and measles morbidity, parental education, father occupation, family income, house type, health seeking behavior and vaccination.

Conclusion: Prevalence of under-nutrition is high in Hyderabad. Child age, birth order, diarrheal and measles morbidity, parental education, father occupation, family income, house type, health seeking behavior and vaccination are associated with the nutritional status of children.

Key Words: Malnutrition, Nutritional status, Stunted

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INTRODUCTION

Malnutrition is a critical global public health problem a fundamental cause that contributes considerably to morbidity and mortality among children that is induced by a number of interconnected variables. Under-nutrition endangers children's physical and cognitive development, increases infection risk, effecting school performances and effecting physical work capacity. Nearly half of all children deaths around the world resulting from the under-nutrition.[1-3]

Globally, over 2 billion people are affected by malnutrition. Roughly over 150 million children under five years of age are stunted, over 50 million are wasted, and approximately 17 million are seriously wasted. Nearly half of children under five in the world with stunting and two-thirds of all wasted children under five in the world lives in Asian countries. Despite the decline in malnutrition among the developing countries, still about 71 million malnourished children residing in India, Nigeria and Pakistan.[4, 5]

Pakistan is amongst the top ten countries in the world where over half of the population under five is stunted, wasted, or both. According to the national nutritional survey 2018, malnutrition is on the rise in Pakistan with nearly one in three children (28.9%) being underweight, four out of ten being stunted (40.2%), and 17.7% suffering from wasting.[6]

Early nutritional deficiencies are linked to poor reproductive outcomes, work capacity, intellectual performance, and overall health in adulthood and

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adolescence in the long run.[2,7] As per UNICEF the major factors of childhood under nutrition can be grouped into 3 major underlying factors as; domestic food insecurity, unhealthy domestic environment and inadequate care, and absence of healthcare services.[6] These sequentially are influenced by employment, poverty, income, dwelling, remittances and assets which are also affected by political and socio-economic factors. Keeping in view such findings regarding factors responsible for malnutrition in children under five years, this study has been conducted to determine the association between socio-demographic and child related factors with malnutrition (under-nutrition) among children having age less than five years in Hyderabad, Sindh.

MATERIALS AND METHODS

Cross-Sectional study was conducted at the Pediatric department, Liaquat University Hospital Jamshoro from August 2020 to Feb 2021. Children visited the pediatric out-patient and/or admitted in pediatric unit during the study duration, aged 6–59 months, regardless of gender, anthropometric measurements not appropriate for their age and whose guardians/parents given permission of participation were included. Whereas, with associated illnesses like congenital abnormalities (like congenital heart diseases), renal failure, metabolic disorders and endocrine disorder and their parents unwilling to take part in the study were excluded.

Children were selected through non-random purposive sampling technique. Sample size of 384 was calculated using standard formula $n=z^2p\ (1–p)/d^2$, where 'z' representing the confidence level of 95% (keeping the value of 1.96), 'p' is the estimated prevalence of malnutrition in under-five children in the Sindh which is 51.6% based on available information[2] and 'd' representing 5% (0.05) significance level.

After getting ethical approval from the Ethical Review Committee (ERC) LUMHS, and informed consent from the parent or guardian of the participants, data was collected using a semi-structured written questionnaire. Children information regarding socio-demographic details, economic condition, parent's information, history of documented diseases, breast feeding status, initiation of weaning time, healthcare seeking behavior etc. were inquired. A digital scale (automated weighing scale) with 100 gram (0.1 kg) gradients was used to determine the child's weight. Height of children (< 2 years) was computed using a length board (infantometer, Baby Weight Machine Unique YRBB-20, China) while height of children (> 2years) measured using a stadiometer up to 0.1 cm (MS Scale Bathroom Camry BR9011). Anthro-plus calculator was used to evaluate the nutritional status of participating children.

Collected information was exported to SPSS version 23.0 and analyzed. Multivariate logistic regression analysis model was applied. Significance level was set as $p<0.05$.

RESULTS

Total 384 children participated in the study. The overall mean age of participants was 24.4±11.4 months. Majority 98(25.5%) of children belongs to age 36-47 months. Mothers of 219(57.0%) participants were had no formal education whereas, amongst the fathers of participants, 117 (30.4%) don't have any formal education. Total 124 (32.3%) had family income of 21 to 30 thousand rupees /month, most 180(47.0%) lives in a joint family.

Figure 1 is demonstrating the under-nutrition status of study participants. Most of the participants had stunted growth. (Figure 1).

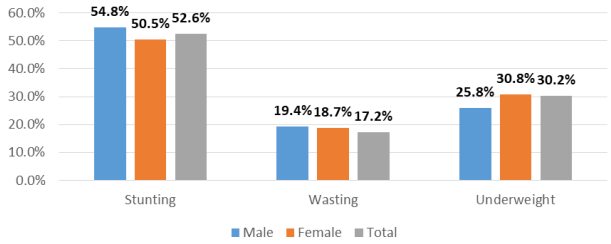

Figure No.1: Gender-wise distribution of under-nutrition details among study participants

Table I is showing the association between child characteristics and under-nutrition among the study participants. Statistically significant association ($p<0.05$) between child's age, birth order, history of measles and diarrhea with the nutritional status.

Parental factors like maternal (mother) education, paternal education, paternal (father) occupation, family type, family income per month and house type showed a statistically significant relation ($p<0.05$) with the under-nutrition. (Table 2).

Total duration of breastfeeding, time of weaning initiation, hand washing practice prior to meals, vaccination status and health seeking behavior had a statistically significant association ($p<0.05$) with under-nutrition. (Table 3).

Table No.1: Multiple logistic regression model for association between Child characteristics and under-nutrition among study participants

	Stunting		Wasted		Under-weight	
	O.R. (C.I. 95%)	P value	O.R. (C.I. 95%)	P value	O.R. (C.I. 95%)	P value
Gender						
Boy	Reference					
Girl	1.87 (1.62-1.95)	<0.001	1.16 (0.70-1.70)	0.360	1.44 (0.92-2.09)	0.254

Age						
6-11	Reference					
12-23	2.44 (2.20-2.85)	<0.001	1.54 (1.27-1.66)	<0.001	1.31 (1.23-2.01)	0.033
24-35	2.08 (1.51-3.41)	0.001	1.32 (1.07-2.11)	0.001	1.19 (1.13-2.30)	0.032
36-47	1.31 (1.20-1.68)	<0.001	0.51 (0.29-0.79)	<0.001	0.39 (0.25-0.81)	0.015
48-59	0.82 (0.63-0.95)	<0.001	0.61 (0.42-0.78)	<0.001	0.49 (0.33-0.79)	0.012
Child's Birth Order						
1st	Reference					
2nd	1.59 (1.14-2.56)	<0.01	1.31 (1.18-2.17)	0.001	1.28 (1.16-1.52)	<0.001
3rd	1.51 (1.25-2.40)	<0.001	1.17 (1.12-2.04)	0.001	1.44 (1.22-3.32)	<0.001
4th & above	2.5 (1.40-3.70)	0.030	2.27 (1.27-4.05)	0.001	3.08 (2.11-8.5)	<0.001
Fever in last 15 days						
Yes	Reference					
No	0.60 (0.15-1.36)	0.883	0.78 (0.32-0.53)	0.594	0.62 (0.15-1.36)	0.883
Measles in last 15 days						
Yes	Reference					
No	0.69 (0.44-0.87)	0.030	0.62 (0.40-0.96)	0.033	0.55 (0.44-0.69)	0.001
Diarrhea in last 15 days						
Yes	Reference					
No	0.65 (0.49-0.86)	0.001	0.77 (0.51-0.89)	0.001	0.60 (0.46-0.78)	0.001
Respiratory infection in last 15 days						
Yes	Reference					
No	0.98 (0.82-1.19)	0.883	0.99 (0.82-1.19)	0.872	0.94 (0.74-1.19)	0.618

Table No.2: Multiple logistic regression model for association between socio-demographic and parents factors with under-nutrition among study participants

	Stunting		**Wasted**		**Under-weight**	
	O.R. (C.I. 95%)	P value	O.R. (C.I. 95%)	P value	O.R. (C.I. 95%)	P value
Maternal education						
Bachelors/ Diploma	Reference					
High school	1.43 (1.12-1.83)	0.002	0.87 (0.5-1.95)	<0.001	0.85 (0.41-0.96)	<0.001
Primary	1.78 (1.42-1.97)	<0.001	0.45 (0.15-0.92)	<0.001	0.56 (0.34-1.85)	<0.001
Illiterate	1.86 (1.37-2.05)	<0.001	0.38 (0.22-0.68)	<0.001	0.73 (0.36-1.35)	<0.001
Paternal (Father) Education						
Bachelors/ Diploma	Reference					
High school	1.32 (1.08-1.55)	0.017	0.60 (0.20-0.95)	0.001	0.87 (0.36-0.91)	<0.001
Primary	1.40 (1.03-1.60)	0.032	0.71 (0.52-0.98)	0.001	0.51 (0.34-1.85)	<0.001
Illiterate	1.28 (0.86-1.46)	0.056	0.29 (0.12-0.69)	0.001	0.69 (0.36-1.05)	<0.001
Father Occupation						
Employed	Reference					
Unemployed	0.57 (0.22-0.89)	<0.001	0.54 (0.07-0.95)	0.004	0.49 (0.12-0.80)	<0.001
Family Type						
Joint	Reference					
Nuclear	2.03 (1.28-3.24)	0.005	1.36 (1.22-2.02)	0.001	1.70 (1.29-2.55)	0.002
Family Income / Month (PKR)						
≥ 41000	Reference					
31000-40000	1.90 (1.01-3.80)	0.040	1.19 (1.11-2.18)	0.033	0.50 (0.24-0.82)	0.042
21000-30,000	0.82 (0.42-0.96)	0.027	0.74 (0.40-0.87)	0.036	0.080 (0.40-0.95)	0.011
≤ 20,000	1.64 (1.30-2.14)	<0.001	0.59 (0.25-0.71)	0.002	0.30 (0.08-0.72)	0.017
House Type						
Cemented	Reference					
Semi Kaccha	0.72 (0.60-0.85)	0.021	0.76 (0.66-0.87)	0.001	0.85 (0.74-0.97)	0.017
Kaccha	0.57 (0.48-0.77)	0.028	0.60 (0.52-0.89)	0.001	0.66 (0.57-0.76)	0.001

Table No.3: Association between child caring practices and under-nutrition among the study participants

	Stunting		Wasted		Under-weight	
	O.R. (C.I. 95%)	P value	O.R. (C.I. 95%)	P value	O.R. (C.I. 95%)	P value
Initiation of Breastfeeding						
Immediately	Reference					
After an hour	1.12 (0.73-1.73)	0.467	1.60 (0.91-2.34)	0.312	1.64 (0.85-2.68)	0.825
Duration of Breastfeeding						
< 12 months	Reference					
> 12 months	0.13 (0.07-0.23)	<0.001	0.27 (0.12-0.38)	0.004	0.69 (0.54-0.88)	<0.001
Weaning Starting						
> 6 months	Reference					
≤ 6 months	1.88 (1.54-2.74)	<0.001	1.45 (1.28-1.72)	<0.001	1.16 (1.11-1.65)	<0.001
Hand Washing Prior to Meal						
Yes	Reference					
No	1.39 (1.25-1.75)	0.026	1.30 (1.14-1.49)	0.001	1.20 (1.15-1.43)	0.039
Hand Washing after Using Toilet						
Yes	Reference					
No	3.72 (0.56-5.66)	0.322	3.80 (0.74-3.75)	0.206	5.76 (0.46-9.58)	0.125
Vaccination Status						
Yes	Reference					
No	4.36 (2.32-8.71)	0.012	4.16 (2.18-7.93)	0.026	4.45 (2.77-7.14)	<0.001
Healthcare Seeking						
Yes	Reference					
No	6.8 (3.90-11.87)	<0.001	4.62 (2.83-7.53)	0.006	5.46 (3.25-9.09)	0.001

DISCUSSION

The prevalence of stunting in our study area was 52.6%, which is of Public health significance is very high "Very High" public health significance. While there is an excessive amount of wasting (17.2%) and underweight (30.2%) in children in this study. The significant prevalence of stunting indicates that these children are undernourished on a long-term basis. This might be brought on by mothers' low socioeconomic and educational standing. Findings of under-nutrition in our study is consistent with that of reported in Nutritional survey of Pakistan 2018.[8] Moreover, our findings are consistent with the studies by Asfaw et al. and Ali A. et. al., these studies have pointed the higher prevalence of under-nutrition among their study participants as mentioned in the present study.[9,5] While findings reported by Ahmada H, et al. related to prevalence of under-nutrition are not consistent with our study.[10]

The pattern of distribution of stunted growth and wasting among male and female children remain same in the present study. While male participating children were more underweight than their counterparts. These findings are consistent with the findings reported in Pakistan's national nutritional survey 2018. The pattern of gender wise distribution of under-nutrition is also in line with Fantahun W, et al and Alemayehu M, et al even though the disparity in nutritional status was similar to that found in a study done in Sindh, Pakistan by Khan GM. et. al.[11,12,3] Significant relations between maternal education and under-nutrition among children have reported by several studies. Our study findings related to maternal education, maternal employment status, father education, monthly family income and resident type are consistent with different studies conducted worldwide.[3, 11, 13-15]

Studies stated that under-nutrition among children born later in order was higher compared with those born earlier.[3, 16, 17] This may be due to the fact that maternal stores get depleted owing to multiple pregnancies resulting in lack of meeting the child nutritional requirements. Duration of breastfeeding, initiation of weaning and vaccination status had a significant association in this study. These findings are consistent with several studies reported the significant association of under-nutrition with these factors.[3, 9, 18, 19] When compared to children who started weaning after six months, children who started weaning before six months have significantly higher odds of being undernourished. The majority of kids were breastfed, which, by itself, cannot satisfy their nutritional needs, especially after six months. The absence of supplemental feeding may contribute to the explanation of why under-nutrition in children grew with age. Due to poverty and lack of access to a diet rich in nutrients,

the majority of children in Pakistan's rural areas are given wheat bread, which cannot by itself meet their nutritional needs.

CONCLUSION

The study concluded that high prevalence under-nutrition (stunting, wasting and underweight) among children 6-59 years in Hyderabad, Sindh. Different factors associated with the nutritional status of children include child age, birth order, diarrheal and measles morbidity, parental education, father occupation, family income, house type, health seeking behavior and vaccination.

Author's Contribution:

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