

# MALNUTRITION AND ITS ASSOCIATED FACTORS AMONG CHILDREN

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## ABSTRACT

**Objectives:** To determine the prevalence of malnutrition and its associated factors among children under two years of age.

**Materials and Methods:** A cross-sectional study was accomplished at Dr. Ruth K.M Pfau Civil Hospital and Dow University Hospital (DUH), Karachi, for six months, from June 2019 to November 2019. Admitted children under two years of age diagnosed with malnutrition, underweight, stunted children, and children's mothers willing to consent were invited to the study. Participants were approached for data collection through the non-probability convenience sampling method. An adopted, validated questionnaire was used for data collection. A chi-square test was utilized to determine the association between demographic variables and the outcome variable (malnutrition).  $P$ -value  $\leq 0.05$  was counted as significant.

**Results:** Out of total 307, the mean age of the children was 13.36 months with an SD of 5.878. The mean of children age 6-59 months in the house was 4.90 with SD of 2.234 and the mean family size was 10.68, with an SD of 3.38. There was almost the same number of both genders of study children. Most child mothers (96.1%) were married and housewives, respectively. There were 56.4% of children found as malnutrition. It was found that mothers' level of education, mother's occupation, source of feeding, child immunization, and the child suffering from diarrhea and vomiting were statistically significantly associated with the malnutrition status of children  $p$ -values  $\leq 0.05$ .

**Conclusion:** The study concluded that malnutrition is a relatively prevalent health-related problem under two years of age. Mothers' level of education, mothers' occupation, source of feeding, child immunization, child suffering from diarrhea and vomiting were significantly associated with malnutrition.

**Key words:** Malnutrition, associated factors, children under two years

## INTRODUCTION

Malnutrition is the state of fewer food substances or improper intake of nutrients, leading to approximately 70% mortality of fewer than two years of age children in Asian countries<sup>1</sup>. It has been observed

that one child from the thirteen children dies due to it. Anthropometry is the scale used to measure children's weight and height growth between five years to roll out the health status regarding malnutrition. Thus, it can affect physiologically and psychologically. This can cause delay milestones in their required age<sup>2</sup>. There would be many causes of malnutrition, such as unemployment, uneducated mother, improper sanitation, inadequate diet, diarrhea, and gastrointestinal infections. The other reasons are bottle feeding, no birth space, number of children, and weakness of mothers<sup>3</sup>. The most com-

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mon disorders are gastrointestinal and respiratory in children, but pregnant women and lactating mothers have improper diet patterns or provisions can result in these common infections and more vulnerability to developing some severe mental or physical conditions<sup>4</sup>. Therefore, United Nations Children Fund (UNICEF) called it a silent crisis state<sup>5</sup>.

The global malnutrition death rate is approximately 3.5 million between one to five years of age; hence in underdeveloped countries, the death rate is more than 25%, and about 143 million 6, 16% of mortality occurs in urban areas, whereas 30% in rural<sup>6,7</sup>. Consequently, it requires vital planning to provide primary education regarding causes and demonstration of preventive measures for its reductions; along with the health provision several other factors needs should be accomplished such as the provision of job, decrease hunger, filtering water, parent's awareness, and proper sanitation<sup>8</sup>. In addition, malnutrition is more common and identified in the drought area than in other geography<sup>9</sup>.

Malnutrition also affects the current disease, which diminishes the physical activity of child<sup>10</sup>. At six months of age, the weaning diet usually begins. Still, due to several factors, this process started earlier without consultation of a pediatrician, and the provision imbalanced diet caused stunting and wasting<sup>11</sup>.

It is established that in Pakistan, males children are more familiar with a prevalence rate of stunting at 43.7%; however, wasting 15.1% at the age of fewer than five years by National Nutritional Survey (NNS)<sup>12</sup>, between under-weight childrens<sup>13</sup>. Hence this is due to several health and community problems which directly impact socioeconomic and child growth<sup>14</sup>. Therefore, the study aimed to determine the prevalence of malnutrition and its associated factors among children under two years of age.

## MATERIALS AND METHODS

This cross-sectional study design employed at two public sector tertiary care hospitals: Dr. Ruth K.M Pfau Civil Hospital and Dow University Hospital (DUH), Karachi. The study was conducted from June to November 2019. All children under two years of age admitted to the Paediatric ward, diagnosed with malnutrition by child specialists, and children's mothers willing to consent were included in the study.

Moreover, patients with a mid-upper arm circumference <115 mm or weight-for-height/length criteria were diagnosed. Mothers who were unwilling to consent, aged more than two years, and outpatients were excluded from the study. The study sample was calculated on OpenEpi version 3.0. It was calculated by taking the prevalence of 27.6% underweight, 95% significance level, and 5% margin of error. The total sample size was 307 of both male and female gender. Non-probability convenience sampling method was used for data collection. Data was collected after approval from the Institutional Review Board (IRB) of Dow University of Health Sciences, Karachi. Written informed consent for data collection was also granted from the Medical Superintendent of Dr. Ruth K.M Pfau Civil Hospital and (DUH) Karachi. All subjects were approached at the pediatric ward of both hospitals. Data was collected in the Morning. The validated tool was adopted to collect the data from previously published research studies and the reliability of the tool was 0.83. The primary author also obtained written permission for the questionnaire used in the current research through email. Data was entered and analyzed by using SPSS version 21. Quantitative variables like the child's age was presented with mean  $\pm$  standard deviation. While, data of qualitative variables such as gender, family size, child mothers' marital status, child mothers' education, and child mothers' occupation were presented in frequency and percentages. A Chi-square test was utilized to determine the association between demographic variables and the outcome variables (malnutrition). P-value  $\leq$  0.05 will count as significant.

## RESULT

Table 1 shows the socioeconomic characteristics of the study participants. The mean age of the children was 13.36 months, with an SD of 5.878. There were, on average, 4.90 children of age 6-59 months in the house, and the mean family size was 10.68 with an SD of 3.38. There was almost the same number of both genders of study children. Most child mothers (96.1%) were married and housewives, respectively.

Table 2 depicts the water and sanitation conditions of the houses of study participants. 76% of houses have no water treatment before giving it to the child. Most (90.9%) of the houses have a latrine; among them, 99.6% were WC. The majority had a handwashing facility near the toilet. However, only 56.4% of mothers washed their hands before feeder

**Table 1: Socioeconomic characteristics of study participants**

Characteristics	n	%
Age of the child	13.36±5.878	
Birth order of the child	2018.00±0.624	
Number of children 6-59 months of age in the household	4.90±2.234	
Family size	10.68±3.338	
<b>Sex of the child</b>		
Male	156	50.8
Female	151	49.2
What is the child's mother's current marital status?		
Married	4	1.3
Divorced	8	2.6
Widowed	295	96.1
What is the highest level of education for the child's mother?		
They did not attend formal school at all	261	85.0
Primary education	36	11.7
Secondary education and above	10	3.3
What is the occupation of the child's mother?		
Housewife	295	96.1
Private job	12	3.9

preparation. Surprisingly, only 31% of mothers washed their hands before feeding the baby. However, almost all mothers washed their hands before milk preparation.

Table 3 depicts environmental and behavioral factors of child health and caring practice. 38.1% of children for whom breastfeeding was initiated immediately after birth, whereas 53.4% of children after 1 to 24 hours. Exclusively breastfeeding was given to 40.7% of children. The source of feeding for 66.4% of children was breastfeeding. More than three times a day, breastfeeding was given to 65.8% of the children. Almost two-thirds of the children were not immunized. Nearly 70% of children were ill in the last two weeks. Three-fourths of the children had diarrhea in the previous month.

Table 4 exhibited the mother's care and the child's malnutrition status. Two-thirds of the children's mothers had an antenatal check-up with a mean visit of 4.30. It was found that 62.5% of children were born at hospitals. There were 56.4% of children found as malnutrition.

**Table 2: Water and sanitation condition of the house of study participants**

Condition	n	%
Do you treat water before giving it to the child?		
Yes	74	24.1
No	233	75.9
Do you have a latrine?		
Yes	279	90.9
No	28	9.1
If it is yes for question 11, What type of latrine do you have?		
WC	278	99.6
Commode	1	0.4
Is there a handwashing facility near the toilet?		
Yes	272	97.5
No	7	2.5
Occasion child or their mother wash their hand by using soap Before feeder preparation		
No	134	43.6
Yes	173	56.4
Before feeding the baby		
No	212	69.1
Yes	95	30.9
After cleaning the baby's bottom		
No	269	87.6
Yes	38	12.4
Before food preparation		
No	0	
Yes	0	
Before milk preparation		
No	306	99.7
Yes	1	.3

## DISCUSSION

The mean age of our study children was 13.36, with the same number of both genders. Most child mothers (96.1%) were widowed and housewives, respectively. In our study, 56.35% of children had malnutrition. Study findings are congruent with an analysis in Ethiopia<sup>15</sup> to identify the prevalence of undernutrition and associated factors in children between 6 to 59 months. It was found that 47.6%, 29.2%, and 13.4% were stunted, underweight, and wasted, respectively. That study also showed that diarrhea, top feeding practices, and lack of space among children are the leading factors of malnutrition. These findings aligned with our research; diarrhea and vomiting are the significant factors.

**Table 3: Environmental, Behavioral factors Child health and caring practice**

Malnutrition Factors	No		Yes		Chi-Square Test	
	n	%	n	%	Statistic	P-value
Gender of the child						
Male	60	44.8%	96	55.5%	3.469	
Female	74	55.2%	77	44.5%		
What is the child's mother's marital status?						
Married	130	97%	165	95.4%	4.77	
Divorced	1	0.7%	7	4.0%		
Widowed	3	2.2%	1	0.6%		
What is the highest level of education for the child's mother?						
Did not attend formal school at all	122	91.0%	139	80.3%	8.129	0.017
Primary education	11	8.2%	25	14.5%		
Secondary education and above	1	.7%	9	5.2%		
What is the occupation of the child's mother?						
Housewife	133	99.3%	162	93.6%	6.332	0.012
Private job	1	.7%	11	6.4%		
Do you treat water before giving it to the child?						
Yes	32	23.9%	42	24.3%	0.007	0.936
No	102	76.1%	131	75.7%		
Do you have a latrine?						
Yes	119	88.8%	160	92.5%	1.233	0.267
No	15	11.2%	13	7.5%		
Source of feeding						
Breastfeeding	80	59.7%	124	71.7%	4.857	0.028
Top feed	54	40.3%	49	28.3%		
Is the child fully immunized?						
Yes	39	29.1%	73	42.2%	5.585	0.018
No	95	70.9%	100	57.8%		
Has the child had diarrhea in the last month?						
Yes	94	70.1%	140	80.9%	4.838	0.028
No	40	29.9%	33	19.1%		
Has the child had vomiting in the last month?						
Yes	41	30.6%	81	46.8%	8.300	0.004
No	93	69.4%	92	53.2%		

Malnutrition has been reported as a central public health problem in Pakistan<sup>16</sup>.

Moreover, a research study employed in Punjab revealed that illiteracy, large family size, lack of breastfeeding, and poverty are the leading factors that can lead to malnutrition in under-5 children<sup>16</sup>. Another recent research study<sup>17</sup> accomplished in the rural setting of Pakistan Sindh exhibited that 47.6% of severe acute malnutrition among children under five years, which is a far higher proportion of malnu-

trition among children than our study. Our findings concur with this research and other studies conducted in India and Bangladesh, where poor breastfeeding practice and mothers' education level were associated with malnutrition<sup>18,19</sup>. In developing countries, parents' education, particularly of the mother, assuredly governs the nutrition status of children, and our study has validated this fact.

Our study showed that mothers' level of education, mothers' occupation, source of feeding, child immunization, and the child suffering from diarrhea

**Table 3: Environmental, Behavioral factors Child health and caring practice**

Factors	N	%
Initiation of breastfeeding		
Immediately after birth	117	38.1
After 1 to 24 hour	164	53.4
After a day	26	8.5
Is the child exclusively breastfed?		
Yes	182	59.3
No	125	40.7
Did you give colostrum to a child in the first three days after delivery?		
Yes	168	54.7
No	139	45.3
Source of feeding		
Breastfeeding	204	66.4
Top feed	103	33.6
Age of child complementary feeding started(in a month)	6.38±1.460	
Frequency of breastfeeding per day		
Twice per day	105	34.2
More than three in a day	202	65.8
Is the child fully immunized?		
Yes	112	36.5
No	195	63.5
Did the child get very ill in the last two weeks?		
Yes	210	68.4
No	97	31.6
Has the child had diarrhea in the last month?		
Yes	234	76.2
No	73	23.8
Has the child had vomiting in the last month?		
Yes	122	39.7
No	185	60.3
Did the child eat with an older sibling?		
Yes	128	41.7
No	179	58.3
Did the child eat with adults?		
Yes	95	30.9
No	212	69.1

and vomiting were significant factors associated with the malnutrition status of children. These children may become nutrition because of less education of the mothers and lack of knowledge about child nutrition. Due to diarrhea and vomiting last month,

undernutrition or stunting may also be affected. Our study also revealed that an improper feeding source is also one factor affecting child malnutrition. Another study conducted in India<sup>20</sup> about factors affecting stunting prevalence in children under five years. That study reported a relatively less proportion of stunting, 43.09% among children when compared with our investigation. That study showed that household wealth, child age, size of the child at birth, delivery place, education of the parents, food security status of the household, and toilet facilities are the factors associated with stunting.

Our study also revealed that three-fourths of the houses had no water treatment before giving it to the child. Nearly half of the mothers washed their hands before preparing the feeder. Only a few mothers washed their hands before feeding the baby. The report of the World Bank advocates that in wealthier households, stunting may also arise because of insufficient food knowledge, feeding practices, unsuitable allocation of food, and poor hygiene practices<sup>21</sup>. Lack of parental education, lack of mothers' and fathers' knowledge regarding child nutrition, and shortage of financial ability to buy suitable foods are the factors associated with malnutrition.

Research completed in rural areas of Ethiopia in children under two years showed that educated mothers were more conscious regarding the health and nutrition of their children. Moreover, mothers care for their children robustly and also ensure good hygiene practice<sup>22</sup>. These findings also aligned with the research accomplished in Papua New Guinea<sup>23</sup>.

## CONCLUSION

It is concluded that this severe issue of malnutrition among children under two years requires to be considered with multi-faceted techniques. First, since mothers' level of education, mothers' occupation, source of feeding, child immunization, and the child suffering from diarrhea and vomiting were significantly associated, these factors need to be worked upon by advancing girls' education and providing information regarding breastfeeding. Furthermore, immunization and family planning programs need to assimilate their respective plans to report the problem of malnutrition.

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