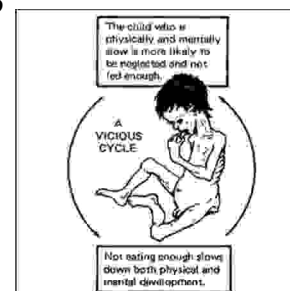


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## MALNUTRITION; DETERMINANTS IN CHILDREN BETWEEN SIX MONTHS TO FIVE YEARS OF AGE IN BAHAWALPUR.



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**ABSTRACT ... [chiefsab@msn.com](mailto:chiefsab@msn.com). Objective:** To find-out the determinants of malnutrition in children between six months to five years age in Bahawalpur. **Study Design:** This was an observational descriptive cross – sectional study. **Setting:** At Paediatric Medicine out – patient department in Bahawal Victoria Hospital, Bahawalpur.. **Period:** From Feb. 2005 to March 2007. **Subjects:** Eleven hundred children with malnutrition having ages six months to five years. Main outcome measures. Determinants of malnutrition in children under – 5 in Bahawalpur. **Results:** This study consists of 1100 sick children between the ages six months to five years brought by their parents (mother) to the Pediatric Medicine out-patient department in Bahawal Victoria Hospital, Bahawalpur. Only the children with malnutrition (undernutrition) were included in the study population. Mothers of these children were interviewed and clinical examination of each child was carried-out to find-out the causes of malnutrition in them. According to Gome's classification, 39.45% of them had first degree malnutrition, 37.10%, second degree and 23.45%, third degree malnutrition. **Conclusion:** The major causes of malnutrition found in our study population included: Illiteracy; food – fads; poverty; lack of breast-feeding; improper weaning; diarrhea and respiratory diseases. All these factors were statistically significant.

**Key words:** Determinants, prevalence, weaning, malnutrition, food-fads, cerebral palsy.

## INTRODUCTION

Malnutrition is defined as a “pathological state resulting from absolute or relative deficiency or excess of one or more of the essential nutrients”<sup>1</sup>. It may be “Primary” malnutrition associated with lack of primary health care and other social/environmental factors and “Secondary” malnutrition due to presence of some underlying diseases. It is one of the leading causes of morbidity and mortality in children globally<sup>13,15</sup>.

According to UNICEF report, two out of every five children in age groups under-five, in Pakistan are malnourished and three, out of every five children under-five years are stunted<sup>22</sup>. Malnutrition continues to be a major public health problem in Pakistan. About 30-40% of children in Pakistan have low height for their age (stunting) and 14% have low weight for their height (wasting)<sup>17,18</sup>.

Proportion of children having low weight for their ages in Pakistan ranges from 38% (moderately under weight) to 13% (Severely under-weight). Boys and girls are equally effected<sup>18,19</sup>. Bahawalpur is one of the backward areas, situated at the southern borders of the province Punjab. Keeping in view all above facts and figures, we planned this study to find-out the determinants of malnutrition in Bahawalpur in children under-five years of age group.

## SUBJECTS AND METHODOLOGY

This was an observational, descriptive cross-sectional study carried-out at Pediatric Medicine out-patient department in Bahawal Victoria Hospital, Bahawalpur from Feb. 2005 to March 2007. The sampling was done by Non-probability Purposive or Judgment, sampling technique. Sample of 1100 malnourished children having ages between 06 months to 5 years, was selected and the required information was collected from the parents accompanying the child, through a predesigned questionnaire (Annexure-I). After explanation and verbal consent of parents their weight for age was calculated. The patients having weight less than 80% for their age, were labeled “malnourished”. They were further subcategorized into three classes according to Gome's classification as follows;

1. Weight for age 70-80% = first degree malnutrition
2. Weight for age 60-69% = second degree malnutrition
3. Weight for age below 60% = third degree malnutrition

The important risk factors for malnutrition in these children were scrutinized.

With the help of a premade proforma, the required demographic information was collected. This included: name; age, gender, address; educational and occupational status of parents of each child. In addition, the nutritional history and history of breast – feeding was specifically taken. Age of weaning was also enquired.

On general physical examination, weight of each child was taken three times by baby weight scale-“Tanita car” 20 Kg, model No. LK 324, Lot No.144, made in Japan. Each child was weighed without shoes and clothing.

Mean of these three readings was taken as the exact weight. Expected weight for age was then worked-out and thus percentage of present weight to the expected weight was calculated. All the children having normal weight for their age were excluded from the study and the percentage was drawn into first degree; second degree and third degree malnutrition.

## STUDY VARIABLES

- a) Dependent variable: Malnutrition.
- b) Independent Variables

Mother's education; monthly income breast – feeding; weaning age, food – fads; underlying diseases – Diarrhoea, respiratory and other diseases.

## Data analysis

Data thus collected was entered into SPSS version 10 and statistical analysis was carried-out. Cross analysis for finding any statistical association between malnutrition and risk factors was done.

**Tests of significance**

These included;

- a) **Co-efficient of Correlation;**  
For finding any association between the studied

variables.

- b) **Chi-square test**  
For the assessment of qualitative data.

**RESULTS**

Age in months	Male		Female		Total
	No of pts	%age	No of pts	%age	
6-12	47	4.27%	58	5.28%	105(9.55%)
12-18	98	8.90%	119	10.82%	217(19.72%)
18-24	75	6.81%	81	7.37%	156(14.18%)
24-30	85	7.72%	74	6.73%	159(14.45%)
30-36	30	2.73%	89	8.09%	119(10.82%)
36-42	45	4.09%	60	5.46%	105(9.55)
42-48	41	3.72%	45	4.09%	86(7.81%)
48-54	47	4.27%	46	4.19%	93(8.46%)
54-60	27	2.46%	33	3%	60(5.46%)
Total	495	45%	605	55%	1100(100%)

Categories of malnutrition	Frequency						P value
	Male	%age	Female	%age	Total	%age	
First Degree Malnutrition (weight 69-80%)	189	17.18	245	22.27	434	39.45	0.04
Second Degree Malnutrition (weight 59-70%)	179	16.28	229	20.82	408	37.10	0.04
Third Degree Malnutrition (weight 60%)	127	11.54	131	11.91	258	23.45	<0.05
Total	495	45	605	55	1100	100	<0.05

Of the total participants, (sample size "n" = 1100), majority of the children were females and frequency of malnutrition was the highest in the age group 12-18 months and the lowest in age group 54-60 months. Table-I shows age and sex distribution of these children in detail.

According to Gome's classification, majority of these

children were having first degree malnutrition especially the female children who were more in number than their male counterparts. Frequency of third degree malnutrition was the least. Table-II gives comprehensive outlook of various categories of malnutrition and the number of children suffering from it in each category. All these figures were statistically significant at p-values less than 0.05.

Table-III. Relationship of important independent variables with malnutrition			
Risk factors	No of children	%age	P value
<b>Mother's education</b>			
Uneducated	693	63%	0.05
Educated	407	37%	
<10 (grades)	289	26.27%	
>10 (grades)	118	10.37%	
<b>Family monthly income (in Pakistan Rupees)</b>			
<Rs.5000/month	778	70.72%	0.04
>Rs.5000/month	322	29.28%	
<b>Meaning age</b>			
At 4-6 months	241	21.90%	0.03
Other than 4-6 months	859	78.10%	
<b>Food fads</b>			
Present	783	71.18%	0.04
Absent	317	28.82%	
<b>Breast feeding</b>			
Exclusive	179	16.27%	0.05
Mixed	663	60.28%	
No breast feeding	258	23.45%	
<b>Diseases</b>			
G I T	771	70.09%	0.04
Respiratory	263	23.91%	
Others	66	6%	

Table – III gives elaborative picture of the important risk factors involved in malnutrition in our study population: -

Most of all the mothers of study children were uneducated and majority of those educated, were having less than 10 grades.

A large number of children included in our study, belonged to low socioeconomic class with their monthly

incomes less than Pakistan rupee 5000.

Regarding weaning ages, in most of the cases, weaning was started after 10-12 months of age of the children. Only a very small number of them were started weaning diets at the proper ages of weaning i.e. 4-6 month.

In about 71% of the cases, the parents had food – fads due to which, first class protein diets, (e.g. egg,) were

not given to them especially during the summer season because of the fear of being hot diet, so may harm the child. Similarly, foods rich in vitamin "C" (like oranges) were not given to the children in winter owing to the fear of its being cool.

Exclusive breast – feeding was started in a negligible number of patients only. Majority of the children either got no breast feeding at all, or breast-feeding was supplemented with various sorts of formula-feeding or animal milk feeding.

Most of the malnourished children included in our study, were suffering from various types of gastrointestinal diseases, especially diarrhoeal diseases and malabsorption syndrome. Also a number of them were suffering from respiratory diseases like pulmonary tuberculosis; whooping cough and measles etc. A very small percentage of children were having congenital birth defects like Ventricular Septal Defect; Fallot's tetralogy; cleft-lip; cleft palate and cerebral palsies etc.

All these associated factors were statistically significant at p values less than 0.05. (for details please see table-III).

## DISCUSSION

Majority of the participants (55%) of our study population, were female patients and rest of 45% were males. This high prevalence in female patients may be due to the fact that our society is male dominant. Therefore, during meal hours, the male children are served first with the best available food and females get their food share at the end of meal session with the left out food only. This practice makes female children more prone to malnutrition. These findings are similar to those reported in previous studies<sup>14,19,20</sup>.

Lack of education, especially in female in rural areas, is a leading factor contributing towards malnutrition. Most of such mothers are ignorant about the importance of breast feeding; weaning diets, proper age of weaning; concept of balanced diet; hazards of cow's-milk or formula-milk feeding and basic concepts of hygiene and

prevention of disease. Consequently, main victims of malnutrition are the children of these families. Our study findings correlate exactly with those already made nationally as well as internationally<sup>1,2,5,6,7,21</sup>.

About 70% of our study children belonged to the poor families having monthly incomes less than Pakistan rupee 5000. Therefore, this factor alone was the leading cause of malnutrition. The poor parents usually have a large number of children as well. So, to feed properly to every child is beyond their financial resources. Moreover, these children were given over-diluted milk, further adding to malnutrition. These finding are the same as reported in the past<sup>3,4,8,9,21</sup>

Moreover, food-fads (concepts of hot and cold foods) were highly prevalent among the majority of parents of children included in our study. Due to this factor, the children were kept deprived of first class protein diets (e.g. egg) and diets rich in vitamins and minerals (like oranges and banana) despite the availability of such foods. These observations are similar to those already made in different settings<sup>10,11,17,19,20</sup>.

Gastrointestinal diseases, especially the diarrhoeal diseases were among the major contributors of malnutrition (70.09%) in our study population. Other contributors included: respiratory diseases; and congenital defects. Similar results have been reproduced by earlier researchers in their research work<sup>12,16,22</sup>.

Since this was a hospital-based study, therefore the causes of malnutrition cited above, may be just the tip of an iceberg. Similar type of further studies are required to be conducted at the gross-route level health care out-lets to find-out further-more undetected causes of malnutrition, as the majority of our population resides in rural areas and visits these health care out-lets for their health care. On the basis of our observations, it is concluded that major determinants of malnutrition in Pediatric population at Bahawalpur include: Illiteracy; poverty; lack of breast-feeding, in-adequate weaning; food – fads; and various types of gastrointestinal and respiratory diseases in addition to birth defects. It is

therefore recommended that:

Arrangements be made for improving female education especially in rural areas.

Provision of quality health care.

Health education programmes regarding, family planning; promotion of breast-feeding; proper weaning and removal of food – fads.

## CONCLUSION

Illiteracy; food-fads, poverty, lack of breast – feeding, Gastro intestinal and Respiratory diseases were among the most leading determinants of malnutrition in children at Bahawalpur.

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## ANNEXURE – I

## QUESTIONNAIRE

“Determinants of Malnutrition in Children between six months to five years of age in Bahawalpur”

Case No. \_\_\_\_\_

Date: \_\_\_\_\_

A. Demographic Data: -

1. Name: \_\_\_\_\_
2. Age: \_\_\_\_\_
3. Gender: \_\_\_\_\_
4. Address: \_\_\_\_\_
5. Presenting Complaints: \_\_\_\_\_
6. Clinical Diagnosis: \_\_\_\_\_
7. Educational Level of Parents:
  - a. Father \_\_\_\_\_
  - b. Mother \_\_\_\_\_
8. Occupation of Parents:
  - a. Father \_\_\_\_\_
  - b. Mother \_\_\_\_\_
9. Type of family:
  - a. Nuclear \_\_\_\_\_
  - b. Extended \_\_\_\_\_
  - c. Polygamous \_\_\_\_\_
10. Total family income per month in Pakistan rupee;
  - a. Less than rupee 5000. \_\_\_\_\_
  - b. More than rupee 5000. \_\_\_\_\_
11. Total number of children under -5. \_\_\_\_\_

B. Nutritional History; -

1. Birth weight of the child \_\_\_\_\_
2. Was body breast fed? Yes/No \_\_\_\_\_
3. If yes, was it – exclusive / supplemented \_\_\_\_\_
4. Age of weaning: \_\_\_\_\_
5. Weaning diets used \_\_\_\_\_
6. Quantity of weaning diet \_\_\_\_\_
7. Frequency of weaning \_\_\_\_\_
8. History of food-fads Yes/No. \_\_\_\_\_
9. If yes, types of foods \_\_\_\_\_
10. Reasons of disliking for any food \_\_\_\_\_

C. General Physical Examination: -

1. Present weight of the child (mean) \_\_\_\_\_
  2. Expected weight \_\_\_\_\_
  3. Degree of malnutrition: \_\_\_\_\_
    - a. First degree \_\_\_\_\_
    - b. Second degree \_\_\_\_\_
    - c. Third degree \_\_\_\_\_
  4. Length / Height for age \_\_\_\_\_
  5. Expected length / height for age \_\_\_\_\_
  6. Vital sign:
    - a. Pulse \_\_\_\_\_
    - b. Respiratory rate \_\_\_\_\_
    - c. Blood pressure \_\_\_\_\_
    - d. Temperature \_\_\_\_\_
  7. Pallor – Yes / No
  8. Skin changes – Yes / No
  9. Hair changes – Yes / No
  10. Tongue changes – Yes / No
  11. Signs of Vit. A deficiency– Yes / No
  12. Signs of Vit. D deficiency– Yes / No
  13. Signs of deficiency of other Vit. Minerals –Yes / No
- D. Systemic Examination \_\_\_\_\_