

NUTRITIONAL ASSESSMENT BY ANTHROPOMETRIC METHODS IN CHILDREN UNDER FIVE YEARS OF AGE

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ABSTRACT

Objective: Undernutrition denotes stunting (low height for age), wasting (Low weight-for-height), or being underweight for their age while over-nutrition denotes obesity. Malnutrition is common globally, especially in the developing world. Different anthropometric measurements are used to assess the nutritional status in children naming Mid upper arm circumference (MUAC), Body Mass Index (BMI), and height for age and indirect indicators like vitamin A supplementation, deworming status, vaccination, and feeding practices.

Materials and Methods: This was a cross-sectional descriptive study carried out in Khyber Teaching Hospital, Peshawar to assess the nutritional status of children from one year to five years. Questionnaires were used to collect data from patients in Pediatric wards and Out-Patient departments, from which percentages and frequencies can be derived, based on the selected variables. Data analysis was done with SPSS-23.

Results: Seventy percent of children were malnourished based on MUAC, 56 % were under-weight on BMI, 48 % has Height for Age (HFA) below -3 z score, weaning started after six months in 45 % of children, 55 % had completed vaccination, 35.5 % had received vitamin A and 55 % had received anthelmintic.

Conclusion: We found that feeding a child with formula milk rather than exclusively breastfed, feeding a child with diluted milk than the standard scale provided on the bottle, delaying weaning of a child, non-satisfactory diet, improper vaccination, not deworming the child and non-satisfactory father or guardian income directly affect child nutritional Health. Both direct and indirect factors for undernutrition in children are highly prevalent in Pakistan.

Keywords: Mid-upper arm circumference (MUAC), Body mass index (BMI), Z score, Weaning.

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INTRODUCTION

Nutrition is defined as the process of taking in food materials by living organisms that enable them to grow, reproduce and maintain themselves.¹ Access to healthy, affordable food and quality nutritional care is deserved by every human being.² The term 'malnutrition' represents a deficiency, excess, or imbalance of various nutrients, resulting in serious adverse effects on body composition, function, and clinical outcome.³ In developing countries, malnutrition is unfortunately still more common in situations of poverty, social isolation, and substance misuse.⁴ Malnutrition can be caused either due to some illness or by some environmental/behavioral factors associated

with decreased nutrient intake and/or delivery.⁵ The terms malnutrition and undernutrition are used equivalently.⁶ Globally, malnutrition is responsible for about 3.5 million deaths and 35% of the morbidities among children under five years of age which makes malnutrition one of the common causes of critical health and development disorders faced by people, mostly children in developing countries.⁷ Acute malnutrition is a form of undernutrition that results from either inadequate energy or protein intake. It may be primary or secondary. Children with primary acute malnutrition are common in low and middle-income countries as a result of inadequate food supply caused by socioeconomic, political, and environmental factors.⁸⁻¹⁰ It is estimated that the number of underweight children (weight-for-age Z score < -2) globally is 101 million (16%). The occurrence of acute and severe malnutrition among children under 5 is above the World Health Organization's target of reducing and maintaining prevalence at under 5% by 2025. Studies using various methods of assessing malnutrition show that the prevalence of acute malnutrition among hospitalized children in developed countries

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ranged from 6 to 51%.¹¹ Pakistan is among the countries in the world with the highest rates of child malnutrition, and it is progressing very slowly in children as compared to other South Asian countries. The basic components of anthropometry include height, weight, body mass index (BMI), body circumferences (waist, hip, and limbs), and skinfold thickness.¹² the present study aimed to assess the nutritional status of anthropometric measurements and factors responsible for malnutrition in children attending the Khyber Teaching Hospital Peshawar, Pakistan.

MATERIALS AND METHODS

This cross-sectional descriptive study was carried out in the outpatient department of Khyber Teaching Hospital, Peshawar to assess the nutritional status of children less than five years of age conducted from November 2020 to August 2021. A total of 200 children were assessed through consecutive convenience sampling techniques. A self-designed questionnaire was used to collect data from patients in the pediatric wards and Out-Patient departments, from which percentages and frequencies can be derived, based on the selected variables. Data analysis was done with SPSS-23.

Table 1: baseline anthropometric measures of children

MUAC (Mid upper arm circumference)	< 11.5 cm	11.5 – 12.5 cm	> 12.5 cm
	140 (70 %)	41 (20.5 %)	19 (9.5%)
BMI	< 18.5	18.6 – 24.9	> 25
	112 (56 %)	47 (23.5 %)	41 (20.5 %)
Height for age (HFA) z- score	< - 3	-2 - -3	> - 2
	48 (24 %)	67 (33.5 %)	85 (42.5 %)
weaning	Before 6 months	After 6 months	After one year
	52 (26 %)	90 (45 %)	58 (29 %)
Feeding	Exclusive breastfeeding	Formula milk	Both
	81 (40.5 %)	31 (15.5 %)	88 (44 %)
Income level	< 15000/month	15000 – 30000	>30000
	68 (34 %)	78 (39 %)	54 (27 %)
vaccination	completed	incomplete	Un-vaccinated
	110 (55 %)	57 (28.5 %)	33 (16.5 %)
Deworming status	Given	Not given	Don't remember
	47 (23.5 %)	139 (69.5 %)	14 (7 %)
Vitamin A	Given	Not given	Don't remember
	71 (35.5 %)	103 (51.5 %)	26 (13 %)

RESULTS

The nutritional status of a total of 200 children was assessed using anthropometric measurements. Results are compiled in the following table.1.

DISCUSSION

In our study, we calculated the BMI and MUAC of the subjects and compared them with the Z percentile score and standard charts. According to the scores, only 9.5 % of the subjects had normal values, 70 % were severely malnourished and 20.5 % were moderately malnourished. These findings are comparable to the results of an international study.¹³ The HFA results show that 24 % were severely stunted, 33.5 % moderately stunted and 42.5 % had normal Z scores. Feeding practices were alarmingly under the target, similar to results in developing countries.¹⁴ Weaning was started in 45 % of cases after six months while in 29 % of cases it was started after one year. In 26 % of cases, complementary feeding was started be-

fore six months of age. All these factors are responsible for the high prevalence of malnutrition. Some studies also show the same results.¹⁵ Mothers' misconceptions about the benefits of early starting weaning were prevalent.

A study conducted in District Malir, Karachi, Pakistan showed that children for whom weaning was started at the recommended age of 4-6 months were found to be significantly less malnourished on anthropometric measurements as compared to the other set in which weaning was started at an earlier or later age.¹⁶ Indirect indicators for nutrition are immunization, vitamin A supplementation, and medication for Deworming. In our study, all these indicators are below fifty percent. These results are consistent with findings reported from other developing countries.¹⁷ Economic status also plays a role in maintaining the nutritional status of children. In 73 % of children, their parents had less than 30000/month income. According to a study low socioeconomic status was highly associated with being underweight.¹⁸

CONCLUSION

We found that feeding a child with formula milk rather than exclusively breastfed, feeding a child with diluted milk than the standard scale provided on the bottle, delaying weaning of a child, non-satisfactory diet, improper vaccination, not deworming the child and non-satisfactory father or guardian income directly affect child nutritional Health. Both direct and indirect factors for undernutrition in children are highly prevalent in Pakistan.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

- Hadi I:** Concept, planning, study design, study conduction, critical review, analysis, manuscript writing.
- Imtiyaz M:** Critical review, discussion, interpretation, manuscript writing, study conduction.
- Idrees A:** Analysis, critical review, study conduction.
- Zafar MS:** Critical Review, study conduction, interpretation.
- khan HM:** Study design, study conduction.
- Muhammad UI:** Study design, study conduction.
- Nabi W:** Critical review, discussion.
- Khan N:** Planning, Study conduction, analysis
- Khan A:** Study design, study conduction.
- Khan A:** Study conduction, critical review.
- Khan B:** Critical review, facilitation of expenses.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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