

## ORIGINAL ARTICLE

## PREVALENCE AND ASSOCIATED RISK FACTORS OF UNDER NUTRITION AMONG CHILDREN AGED 6 TO 59 MONTHS IN INTERNALLY DISPLACED PERSONS OF JALOZAI CAMP, DISTRICT NOWSHERA, KHYBER PAKHTUNKHWA

Waqar Ali, Ayaz Ayub\*, Hamid Hussain\*

Department of Community Medicine, Rehman Medical College, \*Institute of Public Health & Social Sciences, Khyber Medical University, Peshawar-Pakistan

**Background:** The magnitude of under nutrition among children below five years of age is high in Pakistan. Undernutrition and infections are the two most important factors that affect the growth of children. This study explains the extent of undernutrition and prevalence of wasting and stunting among preschool children. **Methods:** This cross sectional study with a sample size of 446 covered the age group 6–59 months in Jalojai Camp, District Nowshera. Height for age, weight for age and weight for height were measured as per WHO guidelines. Systematic random sampling technique was used for sample selection. Data was collected using a questionnaire. **Results:** According to height for age Z-score, out of 446 children studied, 8.5% were stunted and 4.0% were severely stunted. According to weight for age Z score, 11.4% were underweight and 3.6% were severely underweight. According to weight for height Z-score, 4.0% were wasted and 2.7% were severely wasted. **Conclusion:** The undernutrition in children is comparable to the national figures. Although our study found that absence of formal education, big family size, late and early weaning, absence of exclusive breast feeding and poverty were the factors associated with undernutrition in children, they could cause increase in under nutrition in future if not improved.

**Keywords:** Under nutrition, Nutritional assessment, under-5 children, Anthropometry, wasting, stunting, underweight

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### INTRODUCTION

Under-nutrition in children is a problem of developing countries and is considered an important factor for illness and death, attributable to more than half the deaths of children worldwide. It also poses risk to their physical and mental development, which result in poorer level of educational achievement.<sup>1</sup> The UNICEF report established that 146 million children under-five years of age in the developing countries are suffering from inadequate food intake, recurrent infectious diseases, muscle wastage and vitamin insufficiencies.

South Asia has by far the top levels of underweight, affecting 46 per cent of all under-five children with 44 per cent of its children stunted and 15 per cent wasted, significantly in excess of rates in most other regions.<sup>2</sup>

There is a definite possibility that child nutrition would deteriorate in case of displacement of families.<sup>3</sup> Unfortunately due to manmade and natural disasters, many families have been displaced especially in Khyber Pakhtunkhwa from tribal agencies.

Pakistan stands second highest in the stunting rate (43.7%) for many decades after Afghanistan. Nepal and India jointly shared the stunting rate at 43 percent. Pakistan however made some improvement in wasting rate (15%). Pakistan

and Srilanka had third highest wasting rates in the region. Pakistan had lower rates of underweight as compared to other SAARC countries, but Bhutan, Srilanka and Maldives had better rates of underweight.<sup>4,5</sup> The under-five mortality rate for Pakistan is high by international standards: 137 for 1,000 live births.

Results from the National Nutrition Survey (NNS, 2011) shows a disturbing nutrition situation in Khyber Pakhtunkhwa. Undernutrition is one of the key reasons of death amongst infants and young children.<sup>6</sup> About 48% of the children in Khyber Pakhtunkhwa are stunted and 17% wasted. This evidently shows Khyber Pakhtunkhwa have faced chronic undernutrition over a number of years. However underweight children have improved from 35% in the 2001 to 24% in the 2011 survey. Jalojai Camp, District Nowshera is entertaining thousands of internally displaced persons (IDP's) from different tribal areas. These children are especially vulnerable to under nutrition in such circumstances.

As no other study was conducted in Pakistan in internally displaced people to evaluate the nutritional status of children so this study would provide us with baseline assessment of under nutrition in children living in the Jalojai IDP camp, District Nowshera with the objectives to determine the prevalence of undernutrition among children aged

6–59 months in internally displaced persons (IDPs) of Jalojai camp, district Nowshera; and also to determine the factors associated with undernutrition among the same children.

## MATERIAL AND METHODS

A cross-sectional study was conducted at the Jalojai IDP camp, District Nowshera having 11300 under-5 year old children. Children in the IDP's camp were selected through systematic random sampling. Information was collected mainly from the head of the family, due to cultural constraints of the area. The sample size was calculated with an anticipated prevalence rate of 29.7%<sup>4</sup> and margin of error at 0.045 that was 397. However it was increased to 446.

A structured questionnaire was used to collect data about household characteristics and anthropometric measurements. Weight measurements were carried out to the nearest 100 g using a 10 kg beam balance and a 50 kg standard electronic balance. For children below 2 years of age, length was measured to the nearest millimetre in the horizontal position by an infant-meter. Children more than 2 years were measured in a vertical position by a measuring board. Severely diseased and mentally ill children were excluded.

Age was recorded as told by parents but confirmed by comparing with different events and local calendars as birth certificates were not available in most cases. Children were categorized by the informed age into the subsequent groups (in months): 6–18, 18–26, 26–36, 36–46 and 46–59.

Children's immunization information was attained from vaccination cards presented. The education of father and mother was noted. Family size was categorized as small size family (1–2 children), medium size family (3–4 children) and large size family (5 or more children). Monthly household income information in Pakistani Rupees (PKR) was obtained from respondents as a continuous variable and recoded into four categories: ≤5000, >5000–10000, >1000–15000 and >15000. Information about exclusive breast feeding for six months, total duration of breast feeding and weaning was also obtained.

The outcomes of this study were three anthropometric keys, stunting (height-for-age) HAZ, underweight (weight-for-age) WAZ, and wasting (weight-for-height) WHZ. Stunting is a pointer of chronic under nutrition, while wasting regularly measures acute nutritional stress within a population. HAZ is termed as stunted, a disorder that shows chronic undernutrition. WHZ measures the existing nutritional standing of a child while WAZ shows features covered in both HAZ and WHZ.<sup>7</sup> The z-score are calculated by utilizing the World Health

Organization suggested reference population (WHO, 2006).

This study was conducted with the approval by the Ethical Review Board of Khyber Medical University; Peshawar. An informed voluntary consent was obtained. Confidentiality of the data was ensured.

Data was analysed using SPSS 16.0. Univariate and multivariate analysis was done for association between independent and dependent variables. Composite indices like WAZ, HAZ, and WHZ were compared with the WHO reference data. Children with below -2 Z-scores and -3 Z-scores of the reference population were considered as malnourished and severe under nourished respectively. Quantitative Variables were described as Mean±SD. Frequencies and percentages were calculated for qualitative variables.

## RESULTS

The survey collected data on the nutritional status of 446 children between 6–59 months of age. Among 446 children surveyed, (201) 45.1% were boys and (245) 54.9% were girls. The boy to girl ratio was 1: 1.25.

It was found out that majority of fathers and mothers were illiterate. The key occupation of the household was noted in categories and later recorded as not working (79%), agricultural (6%), manual (10%) and employed (5%). Sixty nine (15.5%) children were from a small family (1–2 children/family), 219 (49.1%) were from a medium-sized family (3–4 children/family), and 158 (35.4%) of the children were from a large family (≥5 children per family). The total number of bottle-fed children was 137 (30.7%), while 309 (69.3%) were never fed through bottle. The weaning of children started before the age of six months in 232 (52%), at six month 117 (26.2%) and after six month it was in 97 (21.7%). It was found out that 246 (55.2%) children did not receive any vaccine except polio drops, 135 (30.3%) were partially vaccinated and 65 (14.6%) were fully vaccinated.

According to WAZ-score 379 (85.0%) were normal while 51 (11.4%) were underweight and 16 (3.6%) were severely underweight. According to HAZ-score, 390 (87.4%) were normal while 38(8.5%) were stunted and 18 (4.0%) were severely stunted. According to WAZ-score, out of 446, 416 (93.3%) children were normal while 18 (4.0%) were wasted and 12 (2.7%) were severely wasted.

All the three indices show an interesting association with age, highest at the younger age group, then declining sharply, and subsequently increasingly gradually with increasing age.

We found in our study that underweight, stunting and wasting is more prevalent in the large family size, i.e., 36.7%, 29.7%, 12.7% respectively. It shows that there is a positive relation of family size with WAZ (underweight) and WHZ (wasting) and HAZ (stunting). (Figure-2)

Father and mothers having no formal education show high frequency of undernutrition. Undernutrition was more prevalent in the children whose fathers are not working. We did not find any malnourished children whose fathers were employed.

In this research work, 60% families had earnings less than Rs.10000 per month. In earlier studies, families with poor socio-economic status, where monthly income was Rs.5000 or less, had 52.2% malnourished children, while the families with earning of Rs.10000 and more, had 24.7% malnourished children. In this study families having income >5000 showing high prevalence of under nutrition. We found that 76.9% children were exclusively breast fed. Undernutrition was high in children who were not exclusively breast fed especially underweight and stunting.

In our study we found that 55.2% children haven't received any vaccination except polio drops and only 14.6% children were fully vaccinated. Figure-6 showing that in not vaccinated children there are 24.4% underweight 20% stunted and 9% are wasted. Table-2 shows factors related with nutrition.

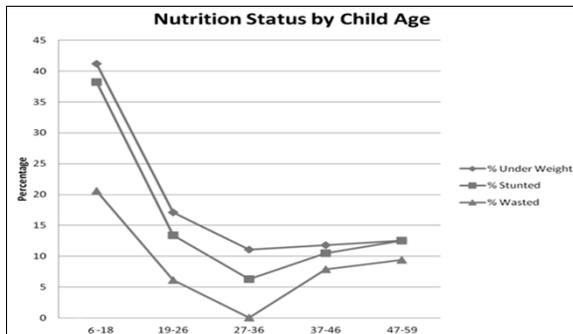


Figure-1: Age and indices

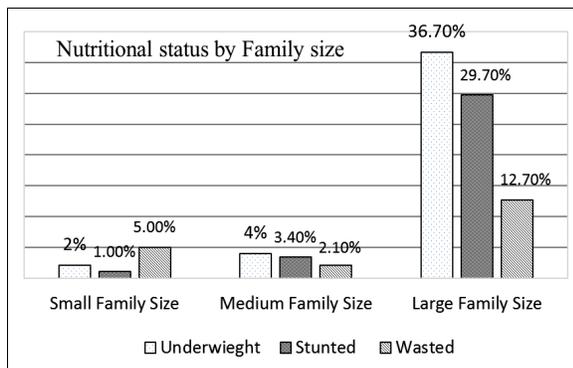


Figure-2: Relation of family size and undernutrition indices

Table-1: Age and sex distribution of sample

Age of child in months	Gender of child		Total
	Female	Male	
6-18 months	28 (82.4%)	6 (17.6%)	34 (100%)
19-26 months	30 (36.6%)	52 (63.4%)	82 (100%)
27-36 months	119 (94.4%)	7 (5.6%)	126 (100%)
37-46 months	31 (40.8%)	45 (59.2%)	76 (100%)
47-59 months	37 (28.9%)	91 (71.1%)	128 (100%)
Total	245 (54.9%)	201 (45.1%)	446 (100%)

Table-2: Factors related with under nutrition by using univariate or multivariate analysis

The variable	Univariate			Multivariate		
	OR	95% CI	p	OR	95% CI	p
Poor Father's Education Level	3.28	2.75-4.08	<0.05	3.23	2.72-4.03	<0.05
Less Household Income	4.75	2.18-5.38	<0.05	4.71	3.1-5.05	<0.05
Large Family Size	2.08	1.43-2.67	<0.05	2.03	1.55-7.42	<0.05
No Breast Feeding	3.78	2.38-5.56	<0.05	3.76	2.13-5.53	<0.05
Bottle Feeding	3.73	2.37-5.44	<0.05	3.49	2.18-5.32	<0.05
Late Weaning Start	2.37	1.87-4.15	<0.05	2.31	1.82-5.16	<0.05
No Vaccination	3.28	2.85-4.94	<0.05	3.13	2.73-4.84	<0.05

## DISCUSSION

Prevalence of underweight is 15%, stunting 12.5% and wasting is 6.7% in children below the age of five years which is quite low as compared to the national figures which are: underweight 31.5%, stunting is 43.7% and wasting is 29.7% that shows better nutritional status of children of our study.

It was witnessed that the key sources of food for the IDPs comprised of food rations given by World Food Programme (WFP) and Provincial Disaster Management Authority (PDMA). There was availability of fortified foods and supplementary feeding centres by these organizations.

A similar study was conducted in Gulu District, Uganda, in which underweight children were 20%, stunted 27% and wasted 32%.<sup>8</sup>

The result showed that younger children were at higher risk of undernutrition than the older children. This finding is similar to the study conducted in displaced population of Ethiopia and Sudan.<sup>9</sup>

The study found that absence of formal education<sup>10</sup>, big family size, late and early weaning, absence of exclusive breast feeding<sup>11</sup> and poverty, and very low coverage of immunization programs were associated with undernutrition in children.

The results highlight that although the frequency of undernutrition in the camp is not high but there exist some risk factors which can create worse situation of undernutrition at any time.

Combination of these issues and undernutrition, in turn, expose children to various infections; hence can cause the increased occurrence of morbidity and mortality.<sup>12</sup>

## CONCLUSION AND RECOMMENDATIONS

Under nutrition prevention efforts should target the younger age groups and there is need to improve the immunization coverage because the immunization status of children is very poor. Supplementary feeding centres and fortified food must be available on large scale for the community. There is a need to establish a nutrition surveillance system to monitor any progression of the nutritional situation.

## AUTHOR'S CONTRIBUTION

WA: Contributed in the study design, questionnaire development, data collection, data analysis and report writing. AA: Contributed in study design, questionnaire development and ethical consideration. HH: Contributed in study design, data collection, data

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## Address for Correspondence:

**Dr. Waqar Ali**, Department of Community Medicine, Rehman Medical College, Peshawar-Pakistan

**Cell:** +92 333 929 9732

**Email:** dr\_waqarali@hotmail.com