



## Nutritional status of children living in orphanage home of Kathmandu district, Nepal

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### Abstract

**Introduction:** Childhood period is the crucial time for overall growth and development in various aspects of life and personality. Nutrition and living arrangement are essential factors which influence overall health status of the children. But the homeless and parentless children are deprived of their childhood rights.

**Objective:** To assess the nutritional status of children living in orphanage homes in Kathmandu district (Province 3), Nepal.

**Methodology:** An institution based cross sectional study was conducted among 111 orphan children aged 5-17 years. A complete enumerative sampling was used. Under nutrition was assessed using anthropometric measurements to calculate percentile score for children and dietary diversity assessment was done using 24-hour dietary recall measurement. Data was collected through semi-structured questionnaire. SPSS version 20, MS-Excel and CDC references was used to entry and analyse data.

**Results:** The study indicated that majority (72.1%) had normal weight, 14.4% of the respondent were underweight, 10.8% were overweight and 2.7% were obese. Less than half (40.5%) of the respondent had normal nutritional status, one third (33.3%), almost one forth (24.3%) and least (1.8%) had 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> degree malnutrition respectively. All most all (100%) respondent ate starchy staple and legume, nuts and seeds, least (9%) of the total respondents ate eggs in a day. But intake of other vitamin A rich fruits and vegetables and organ meat and fish are rare. More than half (62.2%) of total respondents had medium dietary diversity, more than one third (37.8%) respondents had lowest dietary diversity. All most all (100%) house hold presented highest dietary diversity.

**Conclusion:** Present study shows that the prevalence of undernutrition (underweight, overweight, obesity and malnutrition) is still major health problem among underprivileged population like orphans. The nutritional status of vulnerable population comprising of children has been recognized as an important indicator of national development which in turn depends upon social development indices.

**Keywords:** underweight, overweight, obesity, orphans, nutritional status, malnutrition, dietary diversity, Nepal

### Introduction

UNICEF and global partners define an orphan as a child less than 18 years of age who has lost one or both parents to any cause of death. By this definition, there were nearly 140 million orphans globally in 2015, including 61 million in Asia, 52 million in Africa, 10 million in Latin America and the Caribbean, and 7.3 million in Eastern Europe and Central Asia [1]. This large figure represents not only children who have lost both parents, but also those who have lost a father but have a surviving mother or have lost their mother but have a surviving father

Children's living arrangement plays a crucial role on their physical, emotional as well as social development as they fully depend on their families. An ideal living arrangement for a child consists of living with both biological parents [2,3].

Nutritional status is the condition of the body in those respects influenced by the diet; the levels of nutrients in the body and the ability of those levels to maintain normal metabolic integrity. For adults, general adequacy is assessed by measuring weight and height; the result is commonly expressed as the body mass index, the ratio of weight (kg) to height (m<sup>2</sup>). Body fat may also be estimated, by measuring skin fold thickness, and muscle diameter is also measured. For children, weight and height for age are

compared with standard data for adequately nourished children [4].

The global burden of malnourished children is an issue since four consecutive decades and is still common among children living in developing countries. An estimation of 50.6 million children under the age of five is malnourished and those who are severely malnourished and admitted to hospital faced a 30-50% case fatality rate [5]. The death rate can only be brought down for less than 5% with aggressive treatment and diet monitoring if admission was carried earlier. However, public health evidence base for effective control and prevention is a must to overcome rising of diseases secondary to malnutrition in childhood [1].

The WHO has developed child growth standards which describe how a child should grow, and the growth standards are used to identify children who are over-nourished or under-nourished. A child is diagnosed as having under-nutrition when the child's height or length (stunted), weight (underweight), or weight-for-height (wasted) is well below the mean on the growth standards for his or her age [5].

It is estimated that 140 million children are orphans [6]. There are 69 million children worldwide who suffer from malnutrition 75%

Of malnourished children lived in less developed regions [1]. Among countries in the SAARC region, Prevalence of Under nourishment (PoU) is highest for Afghanistan at 23%, followed by Sri Lanka at 22% for 2014-16. The estimate is lowest for Nepal at 8.1% [7]. Prior to Nepal, approximately 16,000 children resided at orphanages. It has been estimated that up to 85% of children in orphanages have at least single parent [8]. 12% of households have foster and/or orphan children, with no differences between rural and urban areas [9].

However, there is very little information about the effect of orphan hood on child nutritional status in study setting and only few evidences examining the nutritional status of orphans who are on care and support from such orphanage and child care homes. Moreover, orphan children are potentially at greater risk of poor health and nutrition because they are more likely to be extremely poor, may receive less care [10].

The result of this study can be utilized by policy makers for policy dialogues and policy formulation, to address the important issue associated with the orphan children like nutritional status, disease prevalence and availability of basic services necessary for orphan children. Government can also utilize the identified problem to generate necessary policies and programs similarly non-governmental organizations who work for orphans can also utilize this study to solve the problems associated with the orphans and orphan care homes. To find out the nutritional status of children living in orphanage homes in Kathmandu district.

## Results

**Table 1:** Socio-demographic variables of respondent aged 5-17 years (n=111)

Demographic Characteristics	Category	n (%)
Age (years)	5-11	57(51.4)
	12-17	54(48.6)
Gender	Male	54(48.6)
	Female	57(51.4)
Religion	Hindu	104(93.7)
	Buddhist	3(2.7)
	Christian	4(3.6)
Education	Pre primary	9(8.1)
	Primary	62(55.9)
	Lower Secondary	29(26.1)
	Secondary	10(9.0)
	Higher Secondary	1(0.9)
Classification of orphan	Single Orphan	64(57.7)
	Double Orphan	47(42.3)
Time Period of Living	Less than 6 months	5(4.5)
	6 months- 1 year	6(5.4)
	1 year- 3 years	30(27.0)
	3 years-5 years	37(33.3)
	5 years-10 years	29(26.1)
	10 years and above	4(3.6)
Food Habits	Vegetarian	5(4.5)
	Non-Vegetarian	106(95.5)

Table 1 illustrates that the socio-demographic status of 111 respondents aged between 5 and 17 years of age, where more than half (51.4%) were aged 5-11 years. Among total respondents, more than half (51.4%) were female. Among respondents, more than half (60.4%) were Brahmin/Chhetri. Maximum (93.7%) follow Hinduism as religion. All of them attended school, among

## Methods

A descriptive cross-sectional research design was used among all the children residing in orphanage homes of Kathmandu district to carry out this research. Participants were from 5 years to 17 years of age. Child with physical disable (hearing, visual, invisible, upper limb disable, HIV Victim, lower limb disability, brain disability, spinal cord disability cognitive or learning disabilities, psychological disorders (mentally unsound) were excluded from the study. Semi structured questionnaire was used to collect the data. The questionnaire was administered in local language. Face to face interview, anthropometric measurement and dietary intake assessment was taken after written informed consent (accent) to the orphan children and their care takers. Also, weighing machine and height measuring scale was used to collect the information regarding weight and height.

Pre-testing of questionnaire was done in among 10% of sample size in similar population at non-study area and necessary modification of questionnaire was done as per requirement. The instruments were calibrated before each measurement to ensure accuracy of measurement. The confidentiality of respondent was maintained completely. Respondents were not enforced to participate in the study. Data entry and analysis was done by using Statistical Package for Social Sciences (SPSS 20 version) and MS-Excel 2013 and CDC 2017, and present in tables, graphs, charts, and bar diagram. Descriptive statistics and Chi- Square test were used as data analysis. Due to short time duration the limited sample size was taken and nutritional deficiencies based on clinical assessment was not done.

them more than half (51.9%) were studying in primary level. More than half (57.5%) of the respondent were single orphan whereas all children living in orphanage homes in full time basis. Respondents living in orphanage homes 3-5 years, 1-3 years, 5-10 years, 6months -1 years, less than 6 months and 10 years and above were respectively 33.3%, 27.0%, 26.1%, 5.4%, 4.5% and

3.6. Among 111 respondents, all most all (95.5%) were non-vegetarian.

**Table 2:** Descriptive Distribution of Weight (in Kg), Height (in cm) and Age (in year) aged between 5-11 years and 12-17 years (n=111)

Statistics	Age		Weight		Height		BMI	
	(5-11)	(12-17)	(5-11)	(12-17)	(5-11)	(12-17)	(5-11)	(12-17)
Mean	9.00	13.91	25.53	43.83	124.57	151.83	16.29	18.81
S.D.	1.76	1.545	5.94	10.67	12.54	10.41	2.054	3.23
Range	6	5	25.00	41.00	54.61	44.45	9.15	14.04
Minimum	5	12	15.00	27.00	97.79	133.35	11.13	13.82
Maximum	11	17	40.00	68.00	152.40	177.80	20.29	27.87

Above table shows that mean age of respondent was 9 years with 1.76 SD which ranges 6 years from 5 years to 11 years, mean weight of respondent was 25.53 kg with 5.94 SD which ranges 25 kg from 15 kg to 40 kg. The mean height of respondent was 124.5714 centimetre with 12.54 SD. The minimum and maximum height is 97.79 centimetre and 152.40 with a range of 54.61 centimetre. The mean BMI of children is 18.48 with 3.48 SD. The minimum and maximum BMI is 9.54 and 34.35 with a range of 9.54. Likewise, mean age of respondent was 13.91s with 1.545 SD which ranges 5 from 12 years to 17 years, and mean weight of respondent was 48.83 with 10.67310 SD which ranges 41 from 27 kg to 68 kg. The mean height of respondent was

151.83 with 10.41 SD. The minimum and maximum height was 133.35 centimetre and 177.80 with a range of 44.45. The mean BMI of respondent was 18.18 with 3.23 SD. The minimum and maximum BMI was 13.82 and 27.87 with a range of 14.04. For the assessment of nutritional status, categorization was adopted from Body mass index-for-age percentiles: CDC references [4].

**Table 3:** Assessment of BMI- percentile of Respondents aged 5-17 years (n=111)

BMI- Percentile Category	Age group 5-11 years (%)		Age group 12-17 years (%)		Total (%)
	Male	Female	Male	Female	
Underweight	26.1%	11.8%	12.9%	8.7%	14.4%
Healthy weight	52.2%	79.4%	87.1%	60.9%	72.1%
Overweight	17.4%	8.8%	0.0%	21.7%	10.8%
Obesity	4.3%	0.0%	0.0%	8.7%	2.7%

The above table shows assessment of BMI for under nutrition of respondent aged 5-17 years. This study shows that majority (72.1%) had normal weight, 14.4% of the respondents were underweight, 10.8% were overweight and 2.7% were obese. For the assessment of nutritional status, categorization was adopted from Gomez classification of mal nutrition and weight of normal child from Disabled world [6].

**Table 4:** Assessment of Malnutrition level of Respondents aged 5-17 years (n=111)

Gomez classification of malnutrition	Degree of malnutrition of aged 5-11 years (%)		Degree of malnutrition of aged 12-17 years (%)		Total (%)
	Male	Female	Male	Female	
Normal nutritional status	52.2%	29.4%	32.3%	56.5%	40.5%
1 <sup>st</sup> degree malnutrition	30.4%	44.1%	22.6%	34.8%	33.3%
2 <sup>nd</sup> degree malnutrition	17.4%	23.5%	41.9%	8.7%	24.3%
3 <sup>rd</sup> degree malnutrition	0.0%	2.9%	3.2%	27.8%	1.8%

The above table expresses assessment of malnutrition level of respondent aged 5-17 years. The study shows that less than half (40.5%) of the respondent had normal nutritional status, one third

(33.3%) of total respondent had 1<sup>st</sup> degree malnutrition, almost one forth (24.3%) had 2<sup>nd</sup> degree malnutrition and least (1.8%) had 3<sup>rd</sup> degree malnutrition.

**Table 5:** Association between socio demographic variables with Body Mass Index, Level of Malnutrition and Individual Dietary Diversity

Variables	BMI	Level of Malnutrition	Individual Dietary Diversity
	P value	P value	P value
Age	0.105	0.047*	0.186
Sex	0.444	0.967	0.001*
Ethnicity	0.144	0.002*	0.001*
Religion	0.515	0.113	0.031*
Study class	0.719	0.182	0.001*
classification of orphan	0.019*	0.711	0.630
Time period of staying in home	0.591	0.305	0.061
Food habit	0.676	0.021*	0.919

This table shows that there is significance relationship between classification of orphan on nutritional status and not significance relationship between age, sex, ethnicity, religion, study class, time period of staying in home and food habit with nutritional status. There is significance relationship between age, ethnicity and food habit on nutritional status and not significance relationship between sex, religion, study class, classification of orphan, and time period of staying in home with nutritional status. There is significance relationship between sex, ethnicity, religion, study class, nutritional status and not significance relationship

between age, classification of orphan, and time period of staying in home and food habit with nutritional status of orphanage children of Kathmandu District.

**Discussion**  
**Socio Demographic Information**

The study showed that among aged between 5 and 17 years of age, where more than half (51.4%) were aged 5-11 years. Among total respondents, more than half (51.4%) were female. The results are in support with other studies. Study done in India

showed almost half (48.6%) were aged 6-11 years. Among total respondent more than half (60%) were female<sup>[11]</sup>. A study done in Nepal, showed half of the respondents (50%) were female<sup>[2]</sup>. In contrast a study in Bangladesh where result showed more than half (56.0%) were male and almost half (43.5%) were aged 15-18 years<sup>[12]</sup>.

The study showed that among aged between 5 and 17 years of age, all most half (51.9%) were studying in primary level and least (0.9%) of total respondents were studying in higher secondary level. Similarly study done in India showed among total respondent more than half (57.14%) were studying in primary level<sup>[11]</sup>. A result is also supported by a study done on Nigeria where result showed that majority (80%) of respondents studied in primary level. Almost half (43.1%) were studying in primary level<sup>[13]</sup>.

The study showed that among aged between 5 and 17 years of age more than half (57.7%) were single orphan and one third (33.3%) of respondent stayed 3-5 years in orphanage home. Similarly a study done in Bangladesh, result showed maximum (87.5%) of respondent were single orphan and almost half (40.5%) respondent stayed 0-4 years in orphanage home<sup>[12]</sup>. In contrast, a study on Dhaka city showed that more than half (64.0%) were double orphan<sup>[14]</sup>.

### Body Mass Index of Children

This study shows that majority (72.1%) had normal weight, 14.4% of the respondent was underweight, 10.8% were overweight and 2.7% were obese. Similarly a study conducted on Ethiopia, where results revealed that 8.9 % of orphans and vulnerable children were underweight<sup>[15, 16]</sup>. As well as a study was conduct among Lebanese school age children living in orphanage in north Lebanon. Result reveals that 9.2% found overweight/ obesity. In contrast, a cross study done where result revealed that more than one tenth of the children were malnourished i.e. majority of the children, 89.7%, were normal, 3.0% were underweight, 5.6% were overweight, and 1.7% were obese among orphan and vulnerable children<sup>[17]</sup>. and a study conducted on Nigeria, result exposed that 18.6% of total subject revealed that stunting presented, 18.6% showed overweight or obesity in subject<sup>[13]</sup>.

### Malnutrition Level of Children

According to Gomez classification the study shows that among 57 girls aged 5-11 years that more than one forth (29.5%) of the respondent had normal nutritional status, less than half (44.1%) of total respondent had 1<sup>st</sup> degree malnutrition, almost one forth (23.5%) had 2<sup>nd</sup> degree malnutrition and least (2.8%) had 3<sup>rd</sup> degree malnutrition. In contrast, a study was conducted where, according to Gomez classification almost one forth (18.33%) girls among nongovernment shelter home and least (6.66%) girls in government shelter home were malnourished in the age of 8 years.<sup>17, 18</sup> This could be due to, lack of proper growth monitoring and lack of necessary diet according to their age and necessity.

### Dietary Diversity of Children

This study shows more than half (53.2%) ate/drank milk and milk products. In contrast, a study in Ethiopia revealed that 8.9 % of orphans and vulnerable children were underweight<sup>[15]</sup>. A study of Bangladesh revealed that milk and milk products were provided only in as a special menu feast and occasionally taken

some fruits<sup>[14]</sup>. This study shows that all most all (100%) respondent ate starchy staple and legume, nuts and seeds, maximum (92.8%) respondents ate other fruits and vegetables, majority (73%) ate dark green leafy vegetables, least (9%) of the total respondents ate eggs in a day. In contrast, a cross sectional study in which result exposed that respondents were of risk of insufficient intake of essential fatty acids as well as dietary diversity was showed low with a medium score of 3 out of 9 food groups and consumption of animal product was rare.<sup>7, 19</sup> As well as a study was conduct among school age children living in orphanage in which result reveals that 92% had in adequate milk and dietary intake.<sup>6</sup>

### Conclusion

The study concludes that there is significance relationship between classification of orphan on body mass index, age, ethnicity and food habit on level of malnutrition and sex, ethnicity, religion, study class, on individual dietary diversity (body mass index, level of malnutrition and dietary diversity) of orphanage children of Kathmandu District.

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### Conflict of Interest Nil

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