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Nutritional Profile of Children in Orphanages of Kashmir Valley: A Cross sectional Study

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ABSTRACT
Objective:- *To assess the prevalence of nutritional problems among children living in orphanages of Kashmir Valley. Design and Settings:- A cross sectional study design was adopted and the study was conducted in orphanages in 6 randomly selected districts of Kashmir Valley during April 2014 - March 2015. Assessment of factors that might be associated with nutritional problems in the defined population was carried out simultaneously.*
Results:- *Among 450 children, prevalence of underweight was found to be 37 % whereas that of overweight was 2.4 %. It was further observed that the prevalence of stunting among study participants was 37.3 %.The prevalence of underweight was found to have a statistically significant association with age, orphanage setting, duration of stay in institution and personal hygiene.The prevalence of overweight was found to have a statistically significant association with type of orphanage, orphanage setting and protein – calorie intake. A statistically significant association was observed between stunting and age, gender, duration of stay in institution and orphanage setting.*
Conclusion:- *Prevalence of underweight and stunting among children living in orphanages is very high. This calls for immediate attention and urgent action with regard to the nutritional needs of this marginalised section of the society.*
Keywords:- *Orphans, Nutritional status, Underweight, Overweight, Stunting.*

INTRODUCTION

A child is primarily defined by age, with most common consensus being less than 18 years[1].The most commonly encountered macronutrient related nutritional problems among children are wasting, overweight and stunting. In India, 43.5% of the children under five years of age are underweight and 48 % are stunted[2]. Directly or indirectly malnutrition contributes to more than 60% of 10 million child deaths each year[3]. It is well recognized that 46 percent children fewer than five in South Asia are moderately or severely underweight. Half of the world's malnourished children are to be found in only three countries, India, Bangladesh and Pakistan[4].Obesity is also increasing especially in the urban affluent class because of unhealthy eating, consumption of junk

and fast foods and also due to changing lifestyles and physical inactivity. The number of adolescents who are overweight or obese is increasing in both low- and high-income countries. At present, the prevalence of overweight and obesity among Indian adolescents is comparable to that among adolescents in many industrialized countries in the West. Overall prevalence of overweight and obesity in adolescents (12–17 years) was 16.6% in India in 2006[5]. It has been seen that the prevalence of overweight in adolescents has increased from 4.1% to 13.9% in Brazil, 6.4% to 7.7% in China and 15.4% to 25.6% in US[6]. In India the prevalence of obesity in adolescent boys is 8.3% and in adolescent girls is 5.5%[7].

The most accepted definition of orphan is ―a child who has lost both parents through bereavement. However, this definition is often extended to include the loss of parents through desertion or abandonment where the parents are unable or unwilling to provide for the child[8]. Orphans exist in every age group and in all civilizations. According to the joint report of UNICEF (United Nations Children's Fund), about 153 million children are orphans worldwide, 17.8 million of them have lost both parents[9]. Out of this number, Asia contributes 6.5% orphans and Africa leads with 11.9% orphans[10]. The number of orphans in India stands at approximately 55 million children of age 0 to 12 years, which is about 47% of the overall population of 150 million orphans in the world[11,12]. According to a report by a UK based NGO "Save the Children", there are 2.14 lakh orphans in Kashmir and 37 % of them were orphaned due to the armed conflict[13]. The age distribution of orphans was fairly consistent across countries, with approximately 12% of orphans being 0–5 years old, 33% being 6–11 years old and 55% being 12–17 years old[14]. UNICEF estimates that at least 2.2 million children in the world live in orphanages[9]. Orphanages are part of every societal culture. How good or how bad an orphanage is depends on the particular country's outlook on abandoned children and obviously the financial situation of these countries[15]. Children raised in large-scale orphanages often have pervasive growth problems, including stunting (severe growth delay), and impairments in fine and gross motor skills and coordination[16,17,18]. There is limited available literature regarding nutritional problems among children residing in orphanages in India in general and in Kashmir in particular. This study was, therefore, undertaken to bridge this knowledge gap so that appropriate remedial measures can be devised and implemented.

AIMS AND OBJECTIVES

- To assess the prevalence of nutritional problems among children living in orphanages of Kashmir Valley.
- To assess the factors associated with nutritional problems in the defined population.

METHODOLOGY

A cross sectional study design was adopted and multistage random sampling technique was employed. Two districts were randomly selected from each of the three zones of Kashmir Valley. After obtaining a list of orphanages and permission to conduct the study from the Department of Social Welfare, one male and one female orphanage, registered as well as unregistered were selected from each district. The inclusion of unregistered orphanages was subject to availability of such orphanages and their willingness to participate in the study. The study was conducted over a period of one year during April 2014 - March 2015.

As the data on prevalence of nutritional problems among children living in orphanages in Kashmir Valley was limited, the sample size was calculated by assuming the prevalence of nutritional problemstobe 50% and as such the sample came out to be 384. To avoid the influence of non-responders, a sample size of 450 was taken for the study.

The number of children in the age group of interest in each orphanage was obtained. Further, appropriate selection of subjects from each orphanage was carried out by PPS (Probability Proportionate to Size) sampling till the required sample size was achieved. Approval for conducting the study was obtained from the Institutional Ethics Committee, Sher-i-Kashmir Institute of Medical Sciences. The study was conducted after obtaining written permission from the Social Welfare Department, Kashmir Division and the Heads of the Institutions selected for the study purpose. The nature and purpose of the study and the procedure involved was explained to the study subjects and their consent was obtained after assuring them of utmost confidentiality. Children in the age group of 10 - 18 years residing in orphanages were included in the study and children refusing to participate in the study were excluded.

A semi-structured, self-formulated study instrument was used to assess the health status among the children living in orphanages. The questionnaire had information related to socio-demographic characteristics, anthropometric measurements and dietary assessment.

Height was measured using a stadiometer on a level surface with the back towards the wall, heels, buttocks, shoulders and occiput in contact with the wall and the head in the Frankfurt plane. Weight was measured using a digital weighing scale on a level and firm surface. Body Mass Index was calculated as per WHO standards using BMI for age Z-scores for boys and girls in the specified age bracket.

Data was analyzed using SPSS Version 20. Appropriate statistical methods (Chi-square test and logistic regression test) were applied as per requirement. P value < 0.05 was taken as significant.

RESULTS

Table -1a: Distribution of study subjects as per socio-demographic profile.

Socio-demographic characteristics		Males N=325		Females N=125		Total (450)	
		No.	%	No.	%	No.	%
Age	10-14 yrs	209	77.4	61	22.6	270	60
	14-18yrs	116	64.4	64	35.6	180	40
Type of family	Nuclear	143	67.5	69	32.5	212	47.1
	Joint	182	76.5	56	23.5	238	52.8
Background	Rural	321	73.3	117	26.7	438	97.3
	Urban	04	33.3	08	66.7	12	2.6
Type of orphanage	Registered	299	71.2	121	21.8	420	93.3
	Unregistered	26	86.7	04	13.3	30	6.6
Type of orphan	Maternal	02	28.6	05	71.4	07	1.5
	Paternal	287	76.3	89	23.7	376	83.5
	Both	02	20	08	80	10	2.2
	Social	34	59.6	23	40.4	57	12.6

Table 1a depicts the socio-demographic profile of the study population. It was observed that out of the total study population, 72.2% were males and 27.8% were females. In the age group of 10-14 years, 77.4% were males and 22.6% were females whereas, in the age group of 14-18 years, 64.4% were males and 35.6% were females. Regarding the type of family it was found that 52.8% belonged to joint family and 47.1% hailed from nuclear family. Further it was observed that majority (93.3%) were residing in registered orphanages whereas only 6.6% were living in orphanages not registered with the government. Regarding the type of orphan, it was found that majority (83.5%) were paternal orphans followed by social orphans (12.6%) whereas maternal orphans constituted only 1.5% of the study participants.

Table- 1b: Distribution of the study subjects as per socio-economic status (*Modified BG Prasad Classification).

*Socioeconomic status	Males(N=325)		Females(N=125)		Total(450)	
	No.	%	No.	%	No.	%
I	-	-	-	-	-	-
II	-	-	1	0.8	1	0.22
III	12	80	3	20	15	3.3
IV	156	76.4	48	23.6	204	45.3
V	157	68.2	73	31.8	230	51.1
Total	325	72.2	125	27.8	450	100

Table –1b depicts the socioeconomic status of the study population. It was found that majority of the participants belonged to the SE class V (51.1%) and class IV (45.3%) whereas only 3.3% and 0.22% of the participants belonged to SE class III and II respectively. There was not even a single participant belonging to SE class I.

Table 2: Distribution of study population as per anthropometric measurements by age.

Age	Height (cm)			Weight (kg)			BMI (kg/m^2)		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
10	137.13	6.97	138.5	27.66	4.03	27	14.99	2.45	13.67
11	138.07	9.42	139	31.92	8.05	36	16.7	3.2	19.15
12	139.85	13.08	141	33.21	7.52	34	17.03	2.92	19.03
13	146.02	11.77	148	36.62	9.94	36	17.11	3.16	14.82
14	151.71	11.98	154	42.35	7.38	42	18.5	2.66	18.91
15	148.68	10.83	150	46.24	5.43	49	21.09	2.57	22.22
16	159.85	9.44	162	52.06	6.51	51	20.57	3.21	20.32
17	150.42	8.18	157	45.57	11.83	45	19.9	4.03	18.73
18	160.48	4.94	160	54	5.64	54	20.96	1.79	20.95
Total	147.46	13.09	148	40.45	11.21	39	18.44	3.52	19.21

Table-2 depicts the anthropometric measurements of study population by age. The variables taken were height for age, weight for age and BMI for age. As transpired from the tabulated data, a positive correlation exists between mean age of the participants and their height except for one indication where the height (150.42±8.18cm) of the participants aged 17 years was found to be lesser than the participants aged 16 years having the height of 159.85±9.44 cm. Further the mean height of the study population was 147.6±13.09cm. As regarding the weight for age, again a positive correlation could be found between the age and weight of the participants being minimum (27.66±4.03kg) for the respondent aged 10 years and maximum (54±5.64) for the respondent aged 18 years. Further the mean weight of the study population was 40.45±11.21kg. With regard to BMI, no regular correlation could be found between the age and BMI as is clear from the recorded values which shows an increasing trend from 14.99 kg/m^2 for the age group of 10 years till 21.09 kg/m^2 for the age group of 15 years, thereafter decreases again for the respective age groups of 16 and 17 years and finally ending with 20.96 kg/m^2 for an age group of 18 years. The minimum value of 14.44±2.45 kg/m^2 was recorded for the age group of 10 years when the maximum value of 21.09±5.64 kg/m^2 was found for the age group of 15 years.

Table 3: Factors affecting prevalence of underweight (WFA) among children in orphanages.

Parameters		Weight for age Normal		Weight for age < -2SD		Total (450)		p value
		No.	%	No.	%	No.	%	
Age	10-14yrs	133	49.4	136	50.6	269	100	0.001**
	14-18yrs	146	83.9	28	16.1	174	100	
Gender	Males	203	63.4	117	36.6	320	100	0.748
	Females	76	61.8	47	38.2	123	100	
Orphanage setting	Rural	105	48.4	112	51.6	217	100	0.001**
	Urban	174	77.0	52	23.0	226	100	
Type of orphanage	Registered	263	63.1	154	36.9	417	100	0.875
	Unregistered	16	61.5	10	38.5	26	100	
Duration of stay	≤1 year	46	46.9	52	53.1	98	100	0.001**
	>1 year	233	67.5	112	32.5	345	100	
Type of family	Nuclear	121	57.9	88	42.1	209	100	0.036*
	Joint	158	67.5	76	32.5	234	100	
Protein intake	Adequate	115	80.4	28	19.6	143	100	0.001**
	Deficit	164	54.7	136	45.3	300	100	
Calorie intake	Adequate	115	80.4	28	19.6	143	100	0.001**
	Deficit	164	54.7	136	45.3	300	100	
Background	Rural	268	62	164	38	432	100	0.009**
	Urban	11	100	-	-	11	100	
Personal hygiene	Poor	62	44.6	77	55.4	139	100	0.001**
	Satisfactory	217	71.4	87	28.6	304	100	
Total		279	63.0	164	37.0	443[#]	100	

Omission of overweight cases from study sample
*significant **highly-significant

Table - 3 depicts the factors affecting prevalence of underweight among children in orphanages. It was observed that the prevalence of underweight (<-2SD) was found more in the age group of 10-14 years (50.6%) as compared to 14-18 years (16.1%) and this association between age and underweight was found to be statistically highly significant (p<0.001). Gender wise it was found that both males and females had more or less equal prevalence of underweight (36.6% and 38.2% respectively). Regarding orphanage setting it was observed that the prevalence of underweight was more in rural area (51.6%) as compared to urban area (23.0%) and the difference was found to be statistically highly significant (p<0.001). It was further observed that the participants whose duration of stay was ≤1 year (53.1%) were having a higher prevalence of underweight as compared to those whose stay was >1 year (32.5%) and this significance was found to be statistically highly significant (p <0.001). Regarding calorie and protein intake, it was observed that the prevalence of underweight was found to be more in participants having deficit diet as compared to those who had adequate diet and this association was found to be statistically highly significant (p<0.001). It was also observed that the prevalence of underweight was more in children from a rural background (38.0%) as compared to those from an urban background (0.0%). This difference was statistically significant (p=0.009). The prevalence of underweight was significantly associated with personal hygiene (p<0.001) with a higher prevalence in those with poor hygiene (55.4%) as compared to those whose personal hygiene was satisfactory (28.6%). However, there was no significant association between type of orphanage and type of family and underweight (p> 0.05).

Table - 4: Factors affecting prevalence of overweight (WFA) among children in orphanages.

Parameters		Weight for age Normal		Weight for age > +1SD		Total (450)		p value
		No.	%	No.	%	No.	%	
Age	10-14yrs	133	99.3	1	0.7	134	100	0.126
	14-18yrs	146	96.1	6	3.9	152	100	
Gender	Males	203	97.6	5	2.4	208	100	1.000
	Females	76	97.4	2	2.6	78	100	
Orphanage setting	Rural	105	93.8	7	6.2	112	100	0.001**
	Urban	174	100.0	-	-	174	100	
Type of orphanage	Registered	263	98.9	3	1.1	266	100	0.001**
	Unregistered	16	80.0	4	20.0	20	100	
Duration of stay	≤1 year	46	97.9	1	2.1	47	100	1.000
	>1 year	233	97.5	6	2.5	239	100	
Type of family	Nuclear	121	97.6	3	2.4	124	100	1.000
	Joint	158	97.5	4	2.5	162	100	
Protein intake	Adequate	115	95.0	6	5.0	121	100	0.044*
	Deficit	164	99.4	1	0.6	165	100	
Calorie intake	Adequate	115	95.0	6	5.0	121	100	0.044*
	Deficit	164	99.4	1	0.6	165	100	
Background	Rural	268	97.8	6	2.2	274	100	0.262
	Urban	11	91.7	1	8.3	12	100	
Personal hygiene	Poor	62	100.0	-	-	62	100	0.353
	Satisfactory	217	96.9	7	3.1	224	100	
Total		279	97.6	7	2.4	286[#]	100	

omission of underweight cases from study sample
*significant **highly-significant

Table – 4 depicts the factors affecting prevalence of overweight among children in orphanages. It was observed that the prevalence of Overweight (>+2SD) was found more in the age group of 14-18years (3.9%) as compared to 10-14 years (0.7%) and this association between age and overweight was found to be statistically insignificant (p=0.126). Gender wise it was found that both males and females have more or less equal prevalence of overweight (2.4% and 2.6% respectively). Regarding orphanage setting it was observed that the prevalence of overweight was more in rural area (6.2%) as compared to urban area the difference was found to be statistically significant (p=0.001). Most of the orphanages who were unregistered with government were having a higher prevalence of overweight (20.0%) as compared to government recognised orphanages(1.1%) and this association was found to be statistically highly significant (p=0.001). It was further observed that the participants whose duration of stay was >1 year (2.5%) where having a higher prevalence of overweight as compared to those whose stay was ≤1 year (2.1%). However, there was no statistical significance between duration of stay and overweight (p=1.000). Regarding calorie and protein intake, it was observed that the prevalence of overweight was found to be more in participants having adequate diet as compared to those who had deficient diet and this association was found to be statistically significant (p=0.044). However, there was no significant association of background, personal hygiene and family type with overweight (p>0.05).

Table - 5: Factors affecting prevalence of stunting (HFA) among children in orphanages.

Parameters		Height for age Normal		Height for age < -2SD		Total (450)		p value
		No.	%	No.	%	No.	%	
Age	10-14yrs	187	69.3	83	30.7	270	100	0.001**
	14-18yrs	95	52.8	85	47.2	180	100	
Gender	Males	170	52.3	155	47.7	325	100	0.001**
	Females	112	89.6	13	10.4	125	100	
Orphanage setting	Rural	192	85.7	32	14.3	224	100	0.001**
	Urban	90	39.8	136	60.2	226	100	
Type of orphanage	Registered	259	61.7	161	38.3	420	100	0.101
	Unregistered	23	76.7	7	23.3	30	100	
Duration of stay	≤1 year	70	70.7	29	29.3	99	100	0.061
	>1 year	212	60.4	139	39.6	351	100	
Type of family	Nuclear	151	71.2	61	28.8	212	100	0.001**
	Joint	131	55.0	107	45.0	238	100	
Protein intake	Adequate	90	60.4	59	39.6	149	100	0.485
	Deficit	192	63.8	109	36.2	301	100	
Calorie intake	Adequate	90	60.4	59	39.6	149	100	0.485
	Deficit	192	63.8	109	36.2	301	100	
Background	Rural	272	62.1	166	37.9	438	100	0.225
	Urban	10	83.3	2	16.7	12	100	
Personal hygiene	Poor	92	66.2	47	33.8	139	100	0.302
	Satisfactory	190	61.1	121	38.9	311	100	
Physical Assault	No	125	86.8	19	13.2	144	100	0.001**
	Yes	157	51.3	149	48.7	306	100	
Total		282	62.7	168	37.3	450	100	

*significant **highly-significant

Table - 5 depicts the factors affecting prevalence of stunting among children in orphanages. It was observed that the prevalence of stunting (< -2SD) was found more in the age group of 14-18years (47.2%) as compared to 10-14 years (30.7%) and this association between age and stunting was found to be statistically highly significant (p<0.001). Gender wise it was found that males (47.7%) had higher prevalence of stunting as compared to females (10.4%) respectively and this association was found to be statistically highly significant (p<0.001). Regarding orphanage setting it was observed that the prevalence of stunting was more in urban area (60.2%) as compared to rural area and this difference was found to be statistically highly significant (p<0.001). It was further observed that the participants whose duration of stay was >1 year (39.6%) where having a higher prevalence of stunting as compared to those whose stay was ≤1 year (29.3%), however, this difference was found to be statistically insignificant (p=0.061). It was also observed that the prevalence of stunting was greater among children who belonged to joint families (45.0%) as compared to those who belonged to nuclear families (28.8%) and this difference was statistically significant (p<0.001). It was found that children who were subjected to physical assault within orphanages had a higher prevalence of stunting (48.7%) as compared to those who did not suffer physical assault (13.2%). This difference was found to be statistically highly significant (p<0.001). On the contrary, factors like type of orphanage, protein/calorie intake, hygiene and background of the respondents had no association with stunting (0>0.05).

Table - 6: Binary logistic regression of various factors associated with underweight.

Parameter		P value	Odds Ratio (OR)	95% CI for OR		Reference
				Lower	Upper	
Age Group	10-14 years	0.000	3.923	2.335	6.589	14-18 years
Duration of Stay	≤1 year	0.019	1.918	1.111	3.313	>1 year
Orphanage Setting	Rural	0.000	4.609	2.832	7.502	Urban
Family Type	Nuclear	0.767	1.072	0.678	1.695	Joint
Caloric Intake	Deficit	0.001	2.497	1.421	4.390	Adequate
Protein Intake	Deficit	0.001	2.497	1.421	4.390	Adequate
Personal Hygiene	Poor	0.002	2.185	1.328	3.594	Satisfactory

On binary logistic regression (multivariate analysis), the prevalence of underweight was found to have a statistically significant association with age, orphanage setting, duration of stay in institution and personal hygiene. The prevalence of underweight was found to be higher in the 10-14 year age group and they had a 3.923 times higher risk of being underweight as compared to 14-18 year olds (p <0.001). Children who had been in the orphanage for ≤1 year were found to have a 1.918 times higher risk of being underweight as compared to those who had been in the institution for >1 year (p=0.019). As far as orphanage setting was concerned, children in rural area had a 4.609 times greater risk of being underweight in comparison to children living in urban area (p <0.001). Children taking a diet deficient in proteins and calories were found to have a 2.497 times greater risk of being underweight in comparison to children taking adequate proteins and calories (p=0.001). It was also observed that children whose personal hygiene was poor had a 2.185 times greater risk of being underweight as compared to children whose personal hygiene was satisfactory (p=0.002). There was no significant association of family type with underweight.

Table - 7: Binary logistic regression of various factors associated with stunting.

Parameter		P value	Odds Ratio (OR)	95% CI for OR		Reference
				Lower	Upper	
Age Group	14-18 years	0.001	2.305	1.377	3.860	10-14 years
Gender	Male	0.001	4.569	1.924	10.853	Female
Duration of Stay	>1 year	0.036	1.882	1.043	3.395	≤1 year
Type of Orphanage	Registered	0.902	1.071	0.362	3.170	Unregistered
Orphanage Setting	Urban	0.000	5.397	2.795	10.422	Rural
Family Type	Joint	0.405	1.235	0.751	2.030	Nuclear
Caloric Intake	Adequate	0.594	1.181	0.641	2.177	Deficit
Protein Intake	Adequate	0.594	1.181	0.641	2.177	Deficit
Background	Rural	0.651	0.675	0.123	3.692	Urban
Personal Hygiene	Satisfactory	0.352	1.288	0.756	2.195	Poor
Physical Assault	Yes	0.673	1.199	0.516	2.788	No

Using binary logistic regression (multivariate analysis), a statistically significant association was observed between stunting and age, gender, duration of stay in institution and orphanage setting. It was observed that the 14-18 year age group had a 2.305 times greater risk of stunting as compared to 10-14 year age group. (p=0.001). Following a similar trend, males were found to be predisposed to stunting with a 4.569 times greater risk of being stunted as compared to females (p=0.001). Those children who had been in the orphanage for > 1 year had a 1.882 times higher risk of stunting as compared to children with a stay duration ≤ 1 year (p=0.036). As far as orphanage setting was concerned, children in urban area had a 5.397 times greater risk of being

stunted in comparison to children living in rural area (p <0.001). There was no significant association of stunting with type of orphanage, caloric/protein intake, background, personal hygiene and physical assault.

DISCUSSION

The mean height of our study group was 147.46 cm with a standard deviation of 13.09 cm and median of 148 cm. The mean weight for the sample was 40.45 kg with a standard deviation of 11.21kg and median of 39kg. The mean BMI of the study population was observed to be 18.44 kg/m^2 with a standard deviation of 3.52 kg/m^2 a median of 19.21 kg/m^2.

The prevalence of underweight or thinness was found to be 36.4%. It was found to be slightly more prevalent among girls (37.6%) as compared to boys (36%). This finding is in agreement with the observations of Mwaniki EW and Makokha AN[19]in their study who reported the prevalence of underweight in boys as 15.9% and among girls as 17.3%.

It was observed that the prevalence of under-nutrition among those who had been in the orphanage for ≤1 year was 52.5%. This percentage decreased to 31.9% among those who had stayed in the institution for >1 year. Similar findings were reported by Panpanichet al[20] in Malawi where children who had been admitted to an orphanage for more than one year were less malnourished than those who had been admitted for a shorter duration. In contrast to this, a study by Mwaniki EW and Makokha AN[19] found the length of stay to correlate directly with the prevalence of malnutrition. This variation may be explained by differences in the diet provided as well as the hygienic practices in the orphanages.

The prevalence of stunting was observed to be 37.3% in the present study. A study conducted by Nwaneri DU and Omuemu VO[21] in Nigeria found the prevalence of stunting among orphanage children to be 24.3%. A study by Ribeira R et al[22] found 16.8% of children among orphanages to be stunted. These differences could reflect the variation in the nutritional status of the study subjects in these studies, pointing towards chronic under-nutrition which could be owing to deficient dietary intake. Among males, 47.7% were stunted whereas among females, this percentage was only 10.4% reflecting that stunting had a significant association with gender (p=0.001). A study by Mwaniki EW and Makokha AN[19]demonstrated similar results with the boys (26.0%) having a higher prevalence of stunting as compared to girls (21.2%). In the present study, it was also observed that the prevalence of stunting increased from 29.3% among those with ≤1 year stay duration in the orphanage to 39.6% among those who had been institutionalized for >1 year. The C-SAFE/WFP Regional Analysis[23] found that in Zimbabwe, stunting rates of orphanage children were directly correlated to the length of stay in the orphanages. Similar findings were reported by Mwaniki EW and Makokha AN[19] who found the prevalence of malnutrition to increase in proportion to increase in length of stay in orphanage.

CONCLUSION & RECOMMENDATIONS

The findings of the study revealed significant prevalence of nutritional problems among children living in orphanages. These findings need to be addressed carefully. Awareness on health problems among orphan children at all levels should be built up. Diet provided in the orphanages should be improved making certain that a balanced diet is provided. Diet schedule for the week should be displayed by the orphanage administration. Monitoring of orphanage functioning by Government agencies is of utmost importance.

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