

**STUDY ON IMPACT OF NHE INTERVENTION ON NUTRITIONAL  
STATUS OF YANADI TRIBE CHILDREN (3-8 YEARS) IN GUNTUR  
DISTRICT OF ANDHRA PRADESH**

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**ABSTRACT**

*Tribals are one of the most exploited and deprived sections of the society. All development indicators show them to be the most excluded from mainstream despite the fact that various kinds of policies and programs have been pursued and executed for their social and economic upliftment in post-Independence India. The present intervention study was conducted on Yanadi tribal children with the objective of assessing the impact of NHE intervention on the Nutritional status of preschool children. The study concludes that nutrition education, as measures for inducing desirable behavioral changes for the ultimate improvement in the nutritional status of all nutrition intervention programmes. Lack of knowledge of the dietary requirements and the nutritive value of different foods is the main contributory cause for the widespread occurrence of malnutrition in developing countries. Nutrition education, which is practical and adapted to suit the socio-economic conditions, food habits and local food resources, can tackle the problem to a great extent.*

**KEYWORDS:** *Nutrition, Nutrition Education, Tribes, Preschool Children*

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**INTRODUCTION**

Nutrition plays a vital role, as inadequate nutrition during childhood may lead to malnutrition, growth retardation, reduced work capacity, poor mental and social development (Awasthi and Kumar 1999). Tribal diets are generally grossly deficient in calcium, vitamin c riboflavin and animal protein (Basu 2000). Generally, three anthropometric indicators are often used to assess nutritional status during childhood: underweight (low weight-for-age), stunting (low height-for-age), and wasting (low weight-for-height). Studies have shown that degree of under-nutrition is higher among the under privileged communities which include the tribal population of our country (Dakshayani et al, 2008). A study carried out to assess the nutritional status of preschool children of the Gond tribal community in Madhya Pradesh observed 60 percent of children to be underweight. Micronutrient deficiencies such as anemia and Vitamin A deficiency were common. Unhygienic personal habit, adverse cultural practices relating to child rearing, breastfeeding and weaning were also

prevalent among them (Rao et al., 2002). Nutritional status among KoraMudi children of Paschim Medinipur, West Bengal revealed that acute malnutrition was higher in preschool children than in school going children (Bisai et al, 2011). In addition, increased nutritional needs in boys than girls and influences of early childhood diseases in boys had resulted in, increased malnutrition among boys than girls. A similar study on nutritional status among Kora- Mudi tribal was carried by Kaushik B, et.al, 2006 focusing on adult ( $18.0 < \text{age} \leq 65.0$  years) in two villages of Phulberia and Siromonipur from Kolkata.

**Objective:** Study on Impact of NHE Intervention on the Nutritional status of Yanadi tribe Children (3-8 years) in Guntur District of Andhra Pradesh.

**Methodology:** Experimental research design was adopted to conduct the study. It is a systematic scientific approach to research, in which the researcher provides intervention for only one group and another group was called as a control group for which intervention was not provided. Post-test results of both the groups were compared and ultimate difference in the experimental group was taken.

### **SELECTION OF EXPERIMENTAL GROUP AND CONTROL GROUP**

Children in the age group of 3-8yrs were randomly selected and subjected to anthropometric measurements. After evaluating their nutritional status, respondents who were in under nourishment category were selected on the basis of their availability and willingness. Total of 120 children with 60 experimental and control group each was selected for the intervention programme.

### **TOOLS AND TECHNIQUES USED**

**Interview Schedule:** Was conducted using a pre-tested semi-structured questionnaire so as to obtain the following information

- Demographic characteristics: age, sex, birth order, previous birth interval.
- Background characteristics: type of tribe, mothers, and fathers educational status, occupational status and personal habits of parents.
- Housing characteristics: type of house, electricity, sanitation facility, type of fuel for cooking, the source of drinking water, a method of drinking water purification.

**Morbidity:** Diarrhea, fever, and cough within last two weeks as described by the mother and where treatment was received. A question regarding any history of diarrhea, fever, and cough in the last two weeks of the survey was asked (diarrhea is determined as perceived by mother or caretaker or as three or more loose watery stools per day, or blood in stool)

### **FGD AND OBSERVATION TECHNIQUES**

Focused group discussions were carried out to explore their awareness on different domains of, health, nutrition, and education of tribal children for in-depth understanding. An observation technique was used to observe the consumption pattern, health, and hygiene of tribal families.

### **PUBLIC PRIVATE PARTNERSHIP**

There are not many studies conducted in the area of **Public and Private Partnership (PPP)** in providing health

and nutritional care & support services to tribal's in India.

The present study is an evaluation type of research. The study on public and private partnership in providing health and nutritional care & support services for tribal children in Guntur district was undertaken to identify their health, nutrition, and educational needs and to assess the adequacy of existing care & support services, to assess the levels of partnership in different areas.

Based on the study, an attempt is made to develop an appropriate intervention model and test its relevance and feasibility participatory methodologies.

### INTERVENTION PROGRAMME

Intervention programme on awareness and dietary modifications to be adopted by Parents and children. This teaching was given to the mothers and children after pre-test. The teaching material validated by the experts before giving to the parents. The researcher planned and Prepared charts, handouts, manuals on Food pyramid, Balanced diet, Health, and hygiene, in keeping the view of importance of pre-primary and primary education for children.

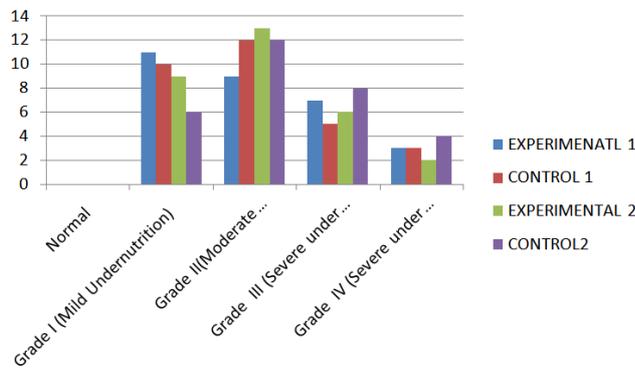
The researcher has conducted intervention sessions by following the above instructions. Food pyramids and teaching charts prepared for the purpose of counsel Guidance for the family especially children and mothers in meal planning, grocery shopping and selection of food items methods of cooking and food preparation. Food charts including Healthy and balanced diets, Foods allowed and foods avoided, Nutrition counseling is given only Intervention group as per the research design. Mothers and children were willingly participated and gave their consent forms. The children were counseled regarding lifestyle modification, physical activity, and health complications. Children were also counseled on the following aspects such as the importance of health, health and hygiene including personal hygiene and self-care. At the time of intervention also provided information pamphlets. The children were asked to come back for follow-up once in a month, for a period of 6 months. Feedback questions were asked to assess children understanding of what was taught. Assessing Nutritional and educational status, utilization of Nutrition, Health care and Educational services of the children were also collected by the researcher after the intervention.

### RESULTS AND DISCUSSIONS

**Table 1: Nutritional Status of Experimental and Control Group as Per Weight per Age Percentile before Intervention**

Classification	Nutritional Status	3-5 yrs (n=60)		6-8yrs (n=60)		Total
		Experimental Group (n=30)	Control Group (n=30)	Experimental Group (n=30)	Control group(n=30)	
>80	Normal	-	-	-	-	-
79.9-70	Grade I (Mild Undernutrition)	11(18%)	10(16.6%)	9 (15%)	6(10%)	36(30%)
60-69.9	Grade II (Moderate undernutrition)	9(15%)	12(20%)	13(21.6%)	12(20%)	46(38.3%)
50-59.9	Grade III (Severe under nutrition)	7(11.6%)	5(8.3%)	6(10%)	8(13.3%)	26(21.6%)
<50	Grade IV (Severe under nutrition)	3(5%)	3(5%)	2(3.3%)	4(6.6%)	12(10%)
<b>Total</b>	<b>Total</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>120</b>

The table depicts the nutritional status of experimental and control group in age groups of 3-5yrs and 6-8yrs before intervention. The study results point out that none of the selected children in both the age groups and in both experimental or control group are in normal nutritional status. Under grade I mild malnutrition 30% of sample, 18% of experimental, 16% of control group (3-5yrs) and 15% of experimental and 10% of control group (6-8yrs). The study indicates in age group 3-5yrs 15% of experimental 20% of control group and in age group 6-8yrs 21.6% in experimental, 20% in control group that means 38.3% of the total sample selected are under grade II moderate malnourished. Under grade III severe malnutrition, 21.6% of selected sample comprising 11.6% of experimental, 8.3% of control in age group 3-5yrs and 10% of experimental, 13.3% of control group in age group 6-8yrs. Under Grade IV severe malnutrition 10% of the sample, 5% of experimental, 5% of control in age group 3-5yrs and in age group 6-8yrs 6.6% of experimental and 10% of control group are severely malnourished. The study concludes that one third of the sample are mild nourished while one third moderately under nutrition. Hence the hypothesis that the nutritional status of Yanadi tribe children is poor is accepted.

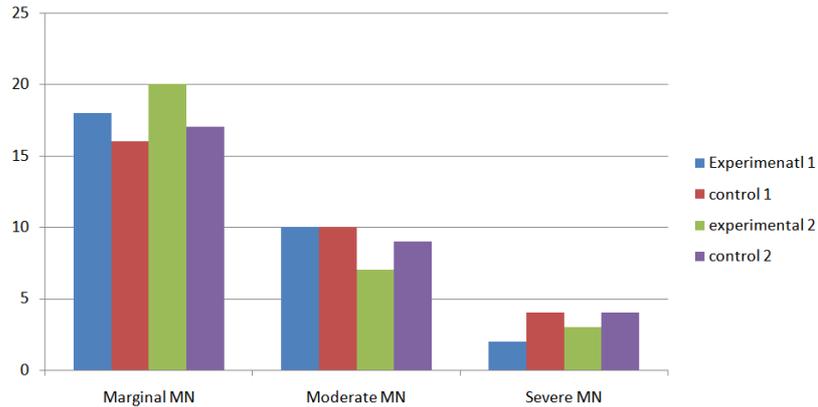


**Figure 1: Nutritional Status of Experimental and Control Group as per Weight per Age Percentile before Intervention**

**Table 2: Nutritional Status of Experimental and Control Group According to Height per Age Percentile before Intervention**

% of Height for Age of NCHS Median Value	Grade of Stunting	3-5 yrs (n=60)		6-8yrs (n=60)		Total
		Experimental Group (n=30)	Control Group (n=30)	Experimental Group (n=30)	Control Group (n=30)	
> Normal	Normal	-	-	-	-	-
90-95%	Marginal MN	18(30%)	16(26.6%)	20(33.3%)	17(28.3%)	71(59.1%)
85-90%	Moderate MN	10(16.6%)	10(16.6%)	7(11.6%)	9(15%)	36 (30%)
< 85%	Severe MN	2(3.3%)	4(6.6%)	3(5%)	4(6.6%)	13(10.9%)
<b>Total</b>		<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>120</b>

The table gives information about the nutritional status of experimental and control group children according to height per age percentile before the intervention. The findings of the study reveal that none of the selected children in experimental and control groups are in normal nutritional status. Nearly more than half of the respondents (59.1%) are in marginal malnutrition status. One-third of the sample 30% are in moderately malnourished while 10.9% are severely malnourished.

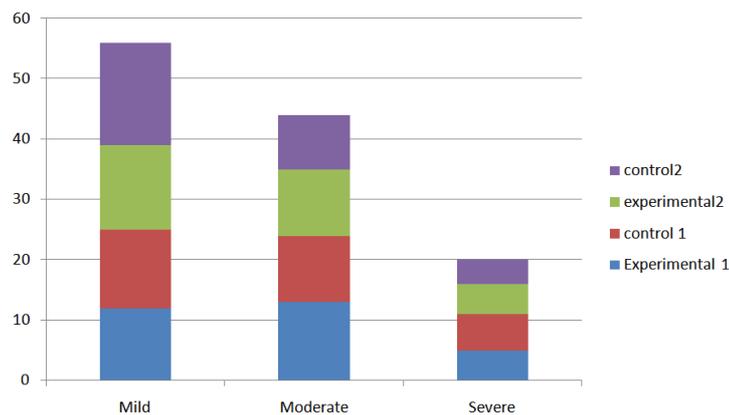


**Figure 2: Nutritional Status of Experimental and Control Group According to Height per Age Percentile before Intervention**

**Table 3: Nutritional Status of Experimental and Control Group According to Weight for Height Percentile before Intervention**

Degree of PEM	(% )Wasting (Weight for Height)	3-5 yrs (n=60)		6-8yrs (n=60)		Total
		Experimental Group (n=30)	Control Group (n=30)	Experimental group (n=20)	Control Group(n=20)	
Normal	90	-	-	-	-	-
Mild	80- 90%	12(20%)	13(21.6%)	14(23.3%)	17(28.3%)	56(46.6%)
Moderate	70-80	13(21.6%)	11(18.3%)	11(18.3%)	9(15%)	44(36.6%)
Severe	< 70	5(8.3%)	6(10%)	5(8.3%)	4(6.6%)	20(16.6%)

Nutritional status of experimental and control group according to weight per height (% wasting) is presented in the table. From the results, it can be said that normal nutritional status is not found in any of the sample selected for the study. Under mild malnutrition status 46.6% (51.6% of the sample in 3-5yrs and 51.6% of 6-8yrs children). One-third of the sample 36.6% (39.9% of 3-5yrs and 33.3% of 6-8yrs) of a sample are moderately malnourished while 16.6% of the selected respondents are severely malnourished.

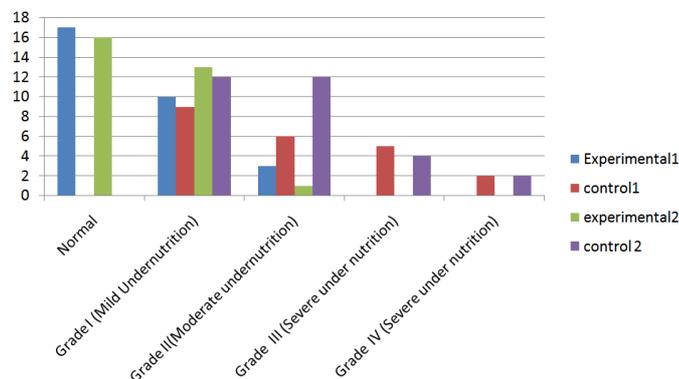


**Figure 3: Nutritional Status of Experimental and Control Group According to Weight for Height Percentile before Intervention**

**Table 4: Nutritional Status of Experimental and Control Group as per Weight for Age Percentile after Intervention**

Classification	Nutritional Status	3-5 yrs (n=60)		6-8yrs (n=60)	
		Experimental Group (n=30)	Control Group (n=30)	Experimental Group (n=30)	Control Group(n=30)
>80	Normal	17(28.3%)	-	16(26.6%)	-
79.9-70	Grade I (Mild Undernutrition)	10(16.6%)	9(11.6%)	13(21.6%)	12 (20%)
60-69.9	Grade II(Moderate undernutrition)	3(5%)	6(10%)	1(1.6%)	12(20%)
50-59.9	Grade III (Severe under nutrition)	-	5(8.3%)	-	4(6.6%)
<50	Grade IV (Severe under nutrition)	-	2(3.3%)	-	2(3.3%)

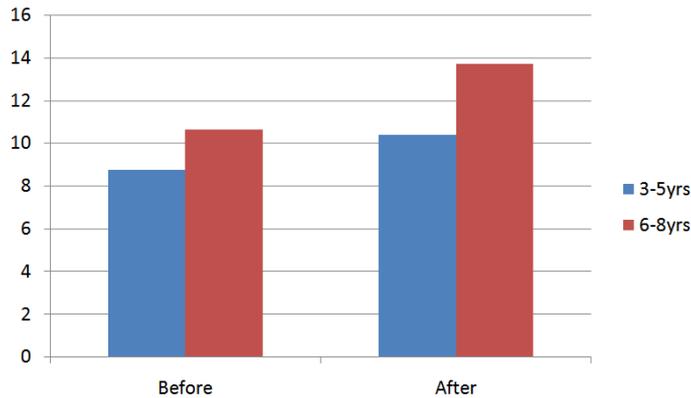
A table presents the nutritional status of Experimental and control group as per weight for age percentile after an intervention. From the findings of the study, it is concluded that, 28.3% of the 3-5yrs experimental group and 26.6% of the 6-8yrs experimental group are found having normal nutritional status while none of the control group sample is in normal nutritional status. In grade mild under nutritional status 16.6% of the experimental group and 11.6% of a control group (3-5yrs age) 21.6% of experimental and 12% of control in 6-8yrs age group. Majority of the control group 10% (3-5yrs) and 20% (6-8yrs) are under Grade II moderate under nutritional status while only 5% (3-5yrs) and 1.6% (6-8yrs) of experimental group is found. None of the experimental groups in 3-5 and 6-8yrs age groups are found in grade III and grade IV malnutrition status while control group children present as they didn't receive any intervention.

**Figure 4: Nutritional Status of Experimental and Control Group as per Weight per age Percentile after Intervention****Table 5: Mean Differences in Weight for Age of Experimental Group before and after Intervention**

S. No	Weigh	3-5 yrs (n= 60)		6-8yrs (n=60)	
		Before	After	Before	After
	Mean	8.75	10.38	10.61	13.7
	SD	1.89	0.79	2.13	1.04
	t value	3.55		5.82	
	p value	0.001**		0.001**	

\*\*p<0.01 level of significance, \* p<0.05, level of significance

The table shows the mean differences in weights of experimental group children before and after the intervention. From the analysis it is found that mean weight of 3-5yrs children before is 8.75kgs and after the intervention the average weight is 10.38kgs after the intervention. In 6-8yrs group children average weight 10.6 kgs increased to 13.7kgs. The calculated t values and p values 0.001 are found to be significant at 0.01 level of significance.



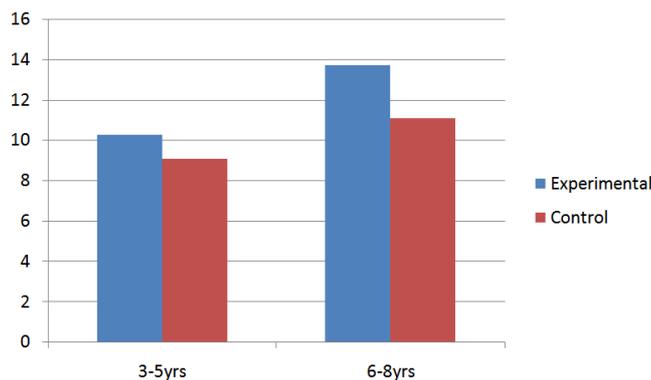
**Figure 5: Mean Differences in Weight for Age of Experimental Group before and After Intervention**

**Table 6: Mean Difference in Weight between Experimental Group and Control Group after Intervention**

Weight in kgs	3-5 yrs (n=60)		6-8yrs (n=60)	
	Experimental Group (n=30)	Control Group (n=30)	Experimental Group (n=30)	Control Group(n=30)
Mean	10.38	9.1	13.7	11.01
SD	0.79	1.12	1.04	2.13
t value	4.176		5.07	
p value	0.002**		0.001**	

\*\*p<0.01 level of significance, \* p<0.05, level of significance

A table gives information about the weight of the experimental and control group children after the intervention. From the findings, it can be said that in 3-5yrs age experimental group average weight is 10.38 (SD= 0.79) while control group children mean weight is 9.1 (SD=1.12) a significant mean weight difference found at 0.002 significance level. The average weight of 6-8yrs experimental group is 13.7kgs (SD= 1.04) while the mean weight of control group is 11.01kgs (SD=2.13). The calculated t and p values are found to be significant at 0.01 level of significance. Hence it is concluded that there is significant weight differences between experimental and control group children. The intervention helped the experimental group to gain more weight than the control group children.

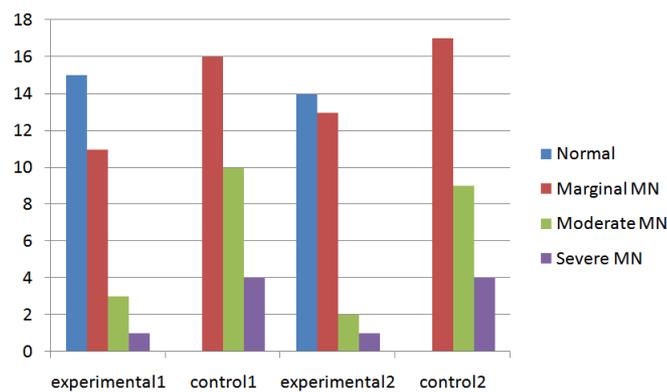


**Figure 6: Mean Difference in Weight between Experimental Group and Control Group After Intervention**

**Table 7: Nutritional Status of Experimental and Control Group According to Height for Age Percentile After Intervention**

% of Height for Age of NCHS Median Value	Grade of Stunting	3-5 yrs (n=60)		6-8yrs (n=60)	
		Experimental Group (n=30)	Control Group (n=30)	Experimental Group (n=30)	Control Group(n=30)
> Normal	Normal	15(25%)	-	14(23.3%)	-
90-95%	Marginal MN	11(18.3%)	16(26.6%)	13(21.6%)	17(28.3%)
85-90%	Moderate MN	3(5%)	10(16.6%)	2(3.3%)	9(15%)
< 85%	Severe MN	1(1.6%)	4(6.6%)	1(1.6%)	4(6.6%)

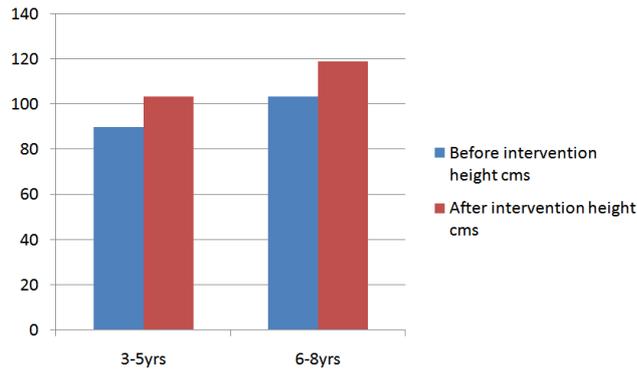
The nutritional status of experimental and control group children in 3-5yrs and 6-8yrs according to the height per age (stunting) presented in the table. The results point of the 15% 3-5yrs and 23.3% 6-8yrs experimental group children are in normal nutritional status while 18.3% 3-5yrs and 21.6% 6-8yrs experimental group are marginal malnourished and in control group, 26.6% 3-5yrs 28.3% 6-8yrs are marginal malnourished. In moderate malnourished, only 5% of 3-5yrs and 3.3% of 6-8yrs experimental are found while in control group 16.6% of 3-5yrs and 15% of 6-8yrs of children are moderately malnourished. Under severe malnourished only 4% of a control group in 3-5yrs and 6-8yrs are found while only 1% of the experimental group are severely malnourished.

**Figure 7: Nutritional Status of Experimental and Control Group According to Height per Age Percentile after Intervention****Table 8: Mean Difference in Height of Experimental Group before and After Intervention**

Height in cms	3-5 yrs		6-8yrs	
	Before	After	Before	After
Mean	89.88	103.45	110.8	119.03
SD	2.12	2.01	1.96	2.32
t value	9.377		17.13	
p value	0.003**		0.001**	

The table depicts mean height differences of an experimental group before and after the intervention.

From the analysis, it is said that the mean height of 3-5yrs children before the intervention, is 89.88 cms and after intervention height increased to 103.45cms. In 6-8yrs age group the average height before intervention, is 110.8cms and after intervention it is 119.3 cms. The calculated T and p values show a significant mean height difference in pre and post-intervention at 0.01 significance level.

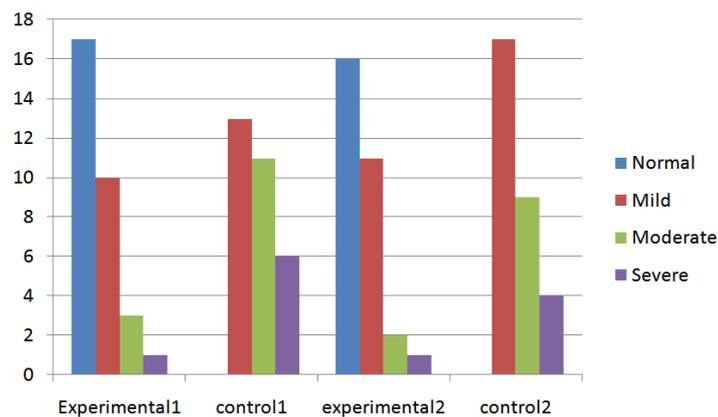


**Figure 8: Mean Difference in Height of Experimental Group before and after Intervention**

**Table 9: Nutritional Status of Experimental and Control Group According to Weight for Height Percentile After Intervention**

Degree of PEM	(% )Wasting (Weight for Height)	3-5 yrs (n=60)		6-8yrs (n=60)	
		Experimental Group (n=30)	Control Group (n=30)	Experimental Group (n=30)	Control Group (n=30)
Normal	90	17(28.3%)	-	16(26.6%)	-
Mild	80- 90%	10(16.6%)	13(21.6%)	11(18.3%)	17(28.3%)
Moderate	70-80	3(5%)	11(18.3%)	2(3.3%)	9(15%)
Severe	< 70	1(1.6%)	6(10%)	1(1.6%)	4(6.6%)

The table depicts the nutritional status (wasting) according to weight for height of experimental and control group children in 3-5 and 6-8yrs age group after the intervention. The findings of the study reveal that after nutrition education programme in experimental group 28.3% of 3-5yrs 26.6% of 6-8yrs are a normal weight for height. In mild malnutrition 16.6% of experimental 21.6% of a control group of 3-5yrs and in 6-8yrs age group 18.3% of experimental and 28.3% of the control group are present. Very meager percentage of experimental group 5% of 3-5yrs and 3.3% of 6-8yrs are found while 18.3% 3-5yrs control and 15% 6-8yrs control group are moderately malnourished. Only one child from an experimental group of 3-5 and 6-8yrs is severely malnourished while 10% 3-5yrs and 6.6% 6-8yrs control group are severely malnourished.



**Figure 9: Nutritional Status of Experimental and Control Group According to Weight for Height Percentile after Intervention**

## CONCLUSIONS

The study results point out that none of the selected children in both the age groups and in both experimental or control group are in normal nutritional status. The anthropometrics measurements revealed that, one third of the sample are in grade I mild nutritional status, one-third grade II moderate malnutrition and one-third severe malnutrition. The experimental group is given intervention through nutrition education, awareness programs. The experimental group which received intervention showed improved weight and height. Nearly 50% of the selected sample in both age groups of 3-5 and 6-8yrs achieved normal nutritional status. And other percents in mild and very few in moderate nutritional status. The control group nutritional status remained same them as they didn't receive the intervention. The mean weight and height of the experimental group increased and showed significant differences from the control group at 0.01 significance level. The t-test analysis also showed significant weight and height differences of the experimental group before and after intervention at 0.01 significance level. In a similar study, Salehiet *al.* (2004) conducted a study in which suitable feeding and hygiene practices were taught to a group of randomly selected Qashqa'i tribe families with 406 children aged 0 – 59 months, a culturally appropriate community-based education intervention approach was used. The results indicated that the children in the study group gained body weight and height. These findings suggest that educational interventions involving parents and/or other family members are important in feeding the children energy- and protein-enriched, hygienic, simple and cheap foods.

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