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RESEARCH ARTICLE

RELATIONSHIP BETWEEN NUTRITIONAL STATUS AND ACADEMIC ACHIEVEMENT OF LAMBANI SCHOOL CHILDREN

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ABSTRACT

A study on the nutritional status and academic achievement of 135 Lambani school children was conducted at Hoovinahadagali taluk, Bellary district during 2012-13. All the children of 9-11 years of age studying in 4th and 5th standards were selected from 5 government primary schools. The nutritional status was assessed by using anthropometric measurements (height and weight), academic achievement interms of previous year grades. The results revealed that there were highly significant differences found in mean height and weight of children with respect to their NCHS norm values in both groups by age and gender. About 40 per cent of children had normal nutritional status while 60 per cent of children indicated short, long or chronic type of malnutrition. With respect to academic achievement It was interesting to note that 37.03 per cent children secured B grade followed by A (28.14%), B^+ (16.29%), C (11.85%) and lastly A^+ (6.7%) grade. It was observed that 2.22 per cent secured A+ grade in younger age group while exactly double (4.44%) in older age group. In B+ achievers 5.18 per cent belonged to 9 year age group while 11.11 per cent 10 year of age group. There was positive and highly significant difference found between nutritional status with academic achievement, Hence increase in the nutritional status of children inturn the academic achievement.

INTRODUCTION

India has several socially disadvantaged communities, among which scheduled tribes are the most deprived. The tribal population that constitutes 9.7 percent of the total population is characterized by widespread poverty, illiteracy, malnutrition, lack of safe drinking water and unhygienic living conditions, which are contributing factors for low health conditions. According to 2011 census Karnataka has 35.64 lakhs of tribal people distributed mainly in Bellary and Raichur districts and various regions of Karnataka.

The Lambani are one of the largest scheduled tribes, which is called by the different names in different parts of the country. They are known as Banjara, Banjari, Lambada and Lambani.The word banjara is said to be derived from the Sanskrit word "*Vana Chara*", meaning wanderers of the jungle. Generally they live in exclusive settlements called '*tandas*', maintaining their cultural affinities and ethnic identity. Today, however they are experiencing many changes in their traditional culture due to exposure of younger generation and school children to urban areas and in turn undergoing considerable transformation. An increasing number of school children in tribal and total population bring demographic transitions that are affecting developing countries such as India. Increase in population affects Human Development Index (HDI) which includes life expectancy, education, income and nutrition indices (Rathod, 2007).

NFHS report (2005) has revealed that over 70 per cent children suffer from iron deficiency, while 1.5 million children suffer from vitamin A deficiency. Thus in India nutritional deficiency due to low food intake, poverty and ignorance contribute to brain damage and low intelligence development among children. This has promoted on increased focus on the diverse needs of the school age children and reduces the heavy burden of malnutrition among them. Many research studies indicated that health problems due to miserable nutritional status in primary school-age children result in low school enrolment, high absenteeism, early dropouts and unsatisfactory classroom performance. The present scenario of health and nutritional status of the school-age children in India is very unsatisfactory. Poor growth is associated with impaired development which is apparent in the relationship between growth status, school performance and intellectual achievement. (Srivastava *et al.*2012).

A new study reported by Satyan in national news paper "Times of India" (dated 6 June 2013) revealed that malnutrition was main cause of deaths all tribal children below six years old in

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40 villages of Attapadi, Tamil Nadu. The children only weighed half of what has been prescribed by WHOM standard. Health workers reported that 5,969 children below six years old in 187 villages had one or the other degree of malnourishment. Another recent report by Asian Human Rights Commission (AHRC) indicated that malnutrition being the main cause of death of the children at Sahariya tribe in Madhya Pradesh **(**Times of India, dtd 10 Oct 2010). The report highlighted that five children died of malnutrition in two months in the Nahargada village and increasing trend of death rate among young children in Shivpuri district since 2004. The Right to Food Campaign Madhya Pradesh discovered that fifty children died of malnutrition. And in the Shivpuri district, 9450 tribal children (20.7%) are severely malnourished at present.

It was observed many research highlighted that malnutrition found more in tribal areas and have strong impact on school going children. The school children are easily accessible, capacitive and responsive group hence the present study conducted on nutritional status and academic achievement of lambani school children with the following objectives such as To assess nutritional status and the academic achievement of younger and older Lambani school children and to know the interrelation between nutritional status and academic achievement of Lambani school children

MATERIAL AND METHODS

The children belonging to 9-11 years of age and studying in group of 4th and 5th standard were selected for the study from 5 tandas schools representing four geographical location of Hoovinahadagali taluk, Bellary district. Nutritional Status was assessed by anthropometric measurements *viz.*, height in cm and weight in kg for 135 children. The height and weight of children were compared to NCHS (National Council of Health Statistics) standard norms with their respective age and categorized according to Waterlow Classification (1972) into normal, wasted, stunted and wasted and stunted category. And personal information was gathered by interviewing child. Previous years academic grades and attendance were noted from the registers of each child. The collected data was analyzed for calculating percentages, t- test, correlation and association between the variables.

RESULTS AND DISCUSSION

The demographic profile of Lambani children covered under the study is presented in the Table 1. It depicts different variables *viz.*, gender, standard and academic achievement. The total population consisted of 135 school children out of which 27.40 per cent belonged to 9-10 year old age group while 72.6 per cent to 10-11 years age group. Totally 51.2 per cent boys and 48.8 per cent of girls included in the study, 28.9 per cent boys were belonged to younger age group while 36.29 per cent belonged to older age group. Among girls 12.59 per cent belonged to younger age group while 36.29 per cent to older age group. In case of standard wise categorization 53.3 per cent children belonged to 4th standard and 46.7 per cent to 5th standard. In case of 4th standard 22.2 per cent were belonged to 9 year age group, while 31.2 per cent to 10 year age group. Among 5th standard children 5.1 per cent belonged to 9 year group while 41.5 per cent to 10 year age group.

The academic achievement was noted by grading system *viz.*, A^{+}, A, B^{+}, B and C grades achieved by the children. It was interesting to note that 37.03 per cent children secured B grade followed by A (28.14%), B^{+} (16.29%), C (11.85%) and lastly A^{+} (6.7%) grade. It was observed that 2.22 per cent secured A+ grade in younger age group while exactly double (4.44%) in older age group. In A grade and B grade achievers 6.66 and 8.88 percent were from younger age group and 21.4 and 28.14 were from older age group respectively. Almost three times more children secured A and B grade in older group than younger group. In C grade achievers 4.44 per cent belonged to 9 year age group while 7.40 per cent to 10 year age group. In B+ achievers 5.18 per cent belonged to 9 year age group while 11.11 per cent 10 year of age group.

Table 1 Demographic profile of lambani children N=135

Categories	Particulars	Age (years)					
		9 -10 (n=37)		10-11 (n=98)		Total	
Gender	Boys	20	(14.81)	49	(36.29)	69	(51.20)
	Girls	17	(12.59)	49	(36.29)	66	(48.80)
Class	4th	30	(22.2)	42	(31.2)	72	(53.30)
	5th	7	(5.1)	56	(41.5)	63	(46.70)
Academic achievement	A+ grade	3	(2.22)	6	(4.44)	9	(6.70)
	A grade	9	(6.66)	29	(21.4)	38	(28.14)
	B+ grade	7	(5.18)	15	(11.11)	22	(16.29)
	B grade	12	(8.88)	38	(28.14)	50	(37.03)
	C grade	6	(4.44)	10	(7.40)	16	(11.85)

Figures in parenthesis indicate the percentages

The means of height and weight of Lambani children were calculated and given in Table 2. And compared with NCHS norm (50th percentile). The per cent decrease was calculated as compared to the NCHS norm. The mean height was almost similar in both age groups (121.75+3.7 and 121.8+5.7 cm). The mean height of children was found lower than the NCHS norm by 6.87 per cent in 9-10 year age group and 11.78 per cent in 10-11 year age group. Similarly the mean weights of both groups were found lower than NCHS norm. The weight of children was found less by 28.08 per cent in younger age group and 31.09 per cent in older age group. When compared to NCHS norm, the mean weight and height of boys and girls found less than NCHS norms. The height of boys and girls were found lower by 5.3 and 5 percent, while weight of boys and girls found less by only 1.77 and 3.6 percent respectively. There was highly significant differences found in mean height and weight (22.72**, 35.44** respectively) of children with respect to their NCHS norms value in both groups by age and (22.33** boys and 24.73** girls) gender. This study supported by Oninla *et al.* (2006) conducted a comparative study of nutritional status among urban and rural Nigerian school children. The result on 366 rural and 383 urban children depicted that mean nutritional indices weight for age, weight for height and height for age were significantly lower in rural than urban children and also concluded that many research studies indicated that malnutrition (under weight, wasting and stunting) constituted major health problems among school children. And also Medhi (2006) also shown similar result such as to assess the growth and nutritional status of school age children (6-14 years) of tea garden workers of Assam, revealed that compared to NCHS standard and affluent Indian children,

the mean height and weight of tea garden children was inferior at all ages. Assessment of nutritional status using WHO recommended anthropometric indicators were calculated and a BMI value less than 5th percentile of reference data was considered the results revealed that of wasting, stunting and underweight was 21.2 percent, 47.4 percent and 51.7 percent respectively among the children in the age group of 6-8 years. Prevalence of stunting and thinness was 53.6 percent and 53.9 percent respectively among the children in the age group of 9-14 years age group.

Gender wise, 79.8% boys and 75.0% girls fall within the Grade I thinness category. Based on the WHO classification, severe malnutrition occurred in 31.3% of the children. Also Sachan *et al.* (2013) reported study on nutritional status of school going adolescent's girls in Lucknow district, Utter Pradesh. Using multistage random sampling was used. A total of 847 school going adolescents' girls between 10-19 years of age were selected. Anthropometric measurements were recorded and compared mean height and weight with ICMR standards for assessing the nutritional status.

Table 2 Height and weight of lambani children by age and gender N=135

		Height (cm)	NCHS value	Difference	t-value	Weight (kg)	NCHS value	Difference	t-value
Age	9 (n=37)	121.75±3.7	130	6.87	13.82**	20.21±2.10	28.10	8.08	22.72**
	10 (n=98)	121.08±5.7	138	11.78	27.96**	21.64±2.39	31.40	9.76	35.44**
Gender	Boys	136±4.5	141.3	5.3	18.32**	31.23±2.5	33	1.77	22.33**
	Girls	136±4.4	141.0	5.0	18.32**	31.1±2.4	34.7	3.66	24.73**

**Significance difference found at one percent level

Table 3 Nutritional status of school children by age N=135

Nutritional status	Age (year)				Total	
	9 -10 (n=37)		10 -11(n=98)			
Normal	30	(22.22)	35	(25.92)	65	(48.20)
Wasted (Short duration malnutrition)	2	(1.48)	2	(1.48)	4	(2.96)
Stunted (Long duration malnutrition)	5	(3.70)	50	(37.03)	55	(40.74)
Wasted and stunted (Chronic and long duration malnutrition)	-		11	(8.14)	11	(8.20)

Figures in parenthesis indicate percentages

Table 4 Relationship between nutritional status and academic achievement N=135

Nutritional status	Academic achievement – grades										r value	Modified ¡² value
	A+		A		B+		B		C			
Normal (n=65)	9	(6.66)	28	(20.74)	9	(6.66)	19	(14.07)	-		0.49**	45.82**
Wasted (n=4)	-		-		-		2	(1.48)	2	(1.48)		
Stunted (n=55)	-		10	(7.40)	12	(8.88)	23	(17.03)	10	(7.40)		
Wasted and stunted (n=11)	-		-		1	(0.74)	6	(4.44)	4	(2.96)		

** significance found at one percent level

Figures in parenthesis indicate percentages

It was highlighted that 48.2 per cent Lambani School children belonged to normal category followed by stunted (40.74%), wasted and stunted (8.2%) and wasted (2.96%) category (Table 3).it indicated that long term malnutrition among tribal children than wasted and stunted and stunted(short and chronic and long type of malnutrition). Among the younger age group 22.22 per cent fell in normal category followed by stunted (3.70%), wasted (1.48 %) and none of them fell in wasted and stunted category. In older age group 37.03 percent of children fell in stunted category followed by normal category (25.92 %), wasted and stunted (8.14%) and only 1.48 per cent in wasted category. This is important to note that in young age group 22.22 per cent of children from 9 year age group fell in normal category while 37.03 per cent of older children belonged to stunted category indicated that prevalence of malnutrition in older group than younger children. This study supported by Goon *et al.* (2011) conducted study on anthropometrically determined nutritional status of urban primary school children in Makurdi of Nigeria. The sample was consist of 2015 (979 boys and 1036 girls), aged 9-12 years, attending public primary school in Makurdi. The nutritional status was assessed by anthropometric parameters measurements such as height and weight. The results revealed that by using the 2007 World Health Organization BMI thinness classification, majority of the children exhibited Grade 1 thinness (77.3%), which was predominant at all ages (9-12 years) in both boys and girls. The result revealed that overall prevalence of thinness was found to be 17.0% and 11.4% and overweight 5.4% and 3.9% among urban and rural school going adolescents girls respectively.

Improved nutritional status has a positive and direct impact on academic achievement. When children's basic nutritional and fitness needs are met, they have the cognitive energy to learn and achieve. Schools continue to be a core place for students to learn and practice healthy eating habits. Researchers showed that healthy, well-nourished children are more prepared to learn, more likely to attend school and class, and able to take advantage of educational opportunities. The relationship between nutritional status and academic achievement of Lambani school children is depicted in Table 4. In normal nutritional category, 20.74 per cent children secured A grade followed by B grade (14.07%) and equal percentage (6.66%) secured by A^+ and B^+ grades, none of children found in C grade. In wasted category the equal percentage of children 1.48 percent fell in B and C grade groups. Among the stunted 7.40 percent secured by A as well as C grades, while 17.03 per cent B grade followed by 8.88 per cent B^+ grades. Among wasted and stunted, the 4.44 percent of children secured B grade followed by C grade (2.96 %) and B+ grade (0.74 %). None of children secured in A+ and A grades. It was interested to note that positive and highly significant relationship and positive

association observed between nutritional status and academic achievement of children. This study supported by (Acham 2010) conducted study on nutrition, health and academic achievement of primary school children in Uganda. The population studied comprised of primary school children in class 4, between the ages of 9-16 years. The results showed that although a number of factors play a significant role in determining a child's educational outcomes, this study has demonstrated that a child's health, nutritional status are some of the potential factors that can influence educational achievement. Essien *et al.* (2012) This study investigated the prevalence of malnutrition and its effect on the academic performance of students in some selected secondary schools in Sokoto metropolis of Sokoto State, Nigeria. The results revealed a high prevalence of malnutrition of 35.4% among the selected secondary school students. It was further observed that SDUSS with the highest prevalence of malnutrition has the poorest performance. Hence activities to reduce the prevalence of malnutrition should be encouraged.

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