

Nutritional Status of *Bhil* Tribal Children in Madhya Pradesh, India: A Cross Sectional Study

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ABSTRACT A cross-sectional study of the nutritional status was conducted on 254 *Bhil* tribal children (133 boys and 121 girls aged 4 to 12 years) in the Goklyakund Gram Panchayat of Indore district of Madhya Pradesh, India. In this study, 24 hours dietary recall method was used to assess dietary intakes of children. Anthropometric measurement in the form of height and weight were recorded and children were classified by WHO criterion (Z-score) using nutritional indices that is, weight for age, height for age and weight for height. Mean intake of energy and protein per day was calculated and compared with Recommended Dietary Allowances (RDA) for Indians. The data revealed that the overall (age-sex combined) prevalence of undernutrition among *Bhil* tribal children was as follows: underweight (69.3%), stunting (63.4%) and wasting (58.7%). In girls, prevalence of underweight (72.7%) and wasting (61.1%) was higher in comparison to boys (66.2% underweight and 56.4% wasting). However, boys suffered more by undernutrition than girls in the age group of 4-6 years. The average consumption of all foods except cereals (maize) and average consumption of protein and energy were also much lower among *Bhil* tribal children than the RDA in all age groups. The results of the study will be useful in the implementation of nutritional intervention programs for improving of *Bhil* tribal health with special focus on children.

INTRODUCTION

As India races towards achieving superpowerdom, it still accounts for about 40 per cent of undernourished children in the World, contributing significantly to the high morbidity and mortality in the country (James 1998). A recent appraisal of diet and nutrition situation in rural India by National Nutritional Bureau revealed that about 45 percent of the pre-school children are undernourished (weight for age < 75% of standard) while about 62 per cent are stunted (height for age < Median-2SD of standard) (NNMB 2001). Undernutrition among children is largely due to the result of dietary inadequacy in relation to their needs (NIN 2003). The sub-

ject captures more concern in tribal children, because of their geographical isolation, inadequate health facilities, insufficient food intake, illiteracy, unhygienic personal habits, adverse cultural practices etc.

In India, a large body of literature on nutritional status of children has merged in the context of urban and rural areas. However, literature on nutritional status of specific tribal children remain scant. Only a few studies have been conducted by the researchers in different States in India (NFHS II 1998-99; Maurya and Jaya 1997; Rao and Rao 1994; NNMB 2000; Choudhary 2001; Balgir et al. 2002; Rao et al. 2006). They have found that tribal children suffer from malnutrition in the form of underweight, stunting and wasting due to dietary inadequacy of energy and protein intake. Some studies revealed a close relationship between tribal ecosystem and their nutritional status. Degradation of ecology and lack of basic health care facilities further aggravate the situation. But there is hardly any study on nutritional status of children among the *Bhil* tribal communities in India. Keeping this in view, the purpose of the present study is to find out the nutritional status of the *Bhil* tribal children in Madhya Pradesh on the basis of nutritional anthropometric indices and food and nutrient intake.

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THE BHIL TRIBE

Madhya Pradesh has the largest tribal population in India. The population of Schedule Tribes in the State is 122.33 lakh constituting 20.27% of the total population (603.85 lakh) as per 2001 Census. The population of *Bhil* tribe in the State is 25.05 lakh and principally inhabit the districts of Dhar, Jhabua, East Nimar and some part of Indore district adjacent to Nimar region of Madhya Pradesh. Formerly, their chief occupation was hunting and exploitation of forest produce but now they have adopted the cultivation of land as their primary occupation. The *Bhils* are economically very poor and majority of them are indebted to money lenders. *Bhils* occupy mostly hill and plateau area of the western part of the Malwa region. The terrain is generally hilly and the soil is light, which is not suited for cultivation. The literacy level among the *Bhils* is found to be very low that is, only 15.5 percent at 2001 Census.

MATERIALS AND METHODS

The present study was carried out in Goklyakund gram panchayat comprising six villages that is Goklyakund, Chasia, Sejgarh, Sherkund, Jhamanjhari and Daliamau in 2002. These villages are mainly inhabited by *Bhil* tribal population. All the six villages were selected for the present cross-sectional study. The selected villages consist of 227 families of which only 133 families having children aged 4-12 years were taken as a study sample. A total of 254 *Bhil* children (133 boys and 121 girls) were considered for the present study. A house-to-house survey was undertaken in the study villages.

Demographic and socio-economic particulars were collected from all the households selected for the survey by using pre-tested, structured proforma. The anthropometric measurements in the form of height and weight of boys and girls were taken using standard techniques (WHO 1995). In addition, the 24 hours dietary recall method was carried out to assess food and nutrient intakes of *Bhil* children. The ages of the *Bhil* children were obtained from the anganwadi and school register book and subsequently cross-checked with teachers, parents, aged members by using local events calendar to ensure accuracy of the records.

The indices of nutritional status (weight for

age, height for age and weight for height) were calculated in standard deviation values (termed as Z-scores) using reference median as recommended by World Health Organisation (WHO 1995). Children who were more than two standard deviation below the reference median ($<-2SD$) on the basis of weight for age, height for age and weight for height nutritional indices were considered as underweight, stunted and wasted respectively. Mean intake of energy and protein was calculated individually and grouped according to ages and finally compared with Recommended Dietary Allowances (RDA) for Indians (ICMR 1990).

RESULTS

Demographic and Socio-economic Profile

About 67% of the families were nuclear, while about 33% were joint families. The average family size was 5.6. About 82% of the houses were *kutchra* and 10% were *semi-pucca*, while *pucca* houses accounted for only 8%. A majority of the households (52%) were marginal farmers, 8% were small farmers and only 3% were large farmers, while about 37% of the households surveyed were landless. Agriculture and collection of forest products was the main occupation of the head of the households. The average *per capita* annual income of the households was Rs.2960/- which is very less than the *per capita* income of the State (Madhya Pradesh-Rs.8284/-).

Anthropometry

Percent distribution of *Bhil* children according to Standard Deviation (SD) classification for weight for age, height for age and weight for height are presented in Table 1. The prevalence of underweight ($<-2SD$ weight for age) was found to be slightly higher in girls (72.7%) than boys (66.2%). The maximum percentage of underweight was found among boys (82.2%) and girls (79.1%) in the age group of 4-6 years. But the prevalence rate was found to be decreasing with the increasing age.

The prevalence of stunting ($<-2SD$ height for age) in both sexes are similar. The highest prevalence of stunting was found in 4-6 years boys (71%) and girls (67.4%). More than 50% of both boys and girls suffered from stunting in 7-9 and 10-12 years age groups. The prevalence of wast-

Table 1: Prevalence (%) of underweight, stunting and wasting among *Bhil* children by gender

Age group	Boys				Girls			
	<i>n</i>	Underweight (<-2SDWeight for age)	Stunting (<-2SD Height for age)	Wasting (<-2SD Height for age)	<i>n</i>	Underweight (<-2SDWeight for age)	Stunting (<-2SD Height for age)	Wasting (<-2SD Height for age)
4-6 years	62	51(82.2)	44(71.0)	47(75.8)	43	34(79.1)	29(67.4)	30(69.8)
7-9 years	40	23(57.5)	21(52.5)	18(45.0)	51	35(68.6)	30(58.8)	29(56.9)
10-12 years	31	14(45.2)	19(61.3)	10(32.3)	27	19(70.4)	18(66.7)	15(55.6)
4-12 years	133	88(66.2)	84(63.2)	75(56.4)	121	88(72.7)	77(63.6)	74(61.1)

ing (<-2SD weight for height) was relatively higher in girls (61.1%) than boys (56.4%). Again the highest prevalence of wasting was found in the age group of 4-6 years. The results revealed that *Bhil* children particularly boys suffered more by under nutrition than girls in the age group of 4-6 years. Overall out of 254 *Bhil* tribal children studied, there were 69.3% underweight, 63.4% stunting, and 58.7% wasting according to the reference criteria (Z-score below -2) recommended by WHO.

Food and Nutrient Intake

In general, the average intake of all foods except cereals (maize) was lower than the RDA among children (both boys and girls) in different age groups of *Bhil* tribe. *Bhil* children consume pulses (*chawla*, *tuar*, *urad*) and green vegetables (*turai*, *bhindi*, *beans*) in a very low quantity. The consumption of root and tubers, sugar and jaggery, fat and oil was low. The intake of milk and milk products among children was grossly inadequate. However, the intake of all foods was better in boys as compared to girls.

Table 2 shows average intake of protein (gm/d) and energy (k cal/d) among *Bhil* Children. The average intake of protein and energy consumed by both boys and girls was below the RDA in all age groups. In case of protein consumption, girls consumed marginally higher amount protein

(18gm/d) compared to boys (17gm/d) in 4-6 years age group but less in 7-9 years and 10-12 years age group. Whereas boys consumed higher energy than girls in all age groups.

DISCUSSION

The *Bhils* are socio-economically backward with a majority of households surveyed living in *kutcha* houses, with an average per capita income of less than Rs.3,000/- per annum. The major occupation is agriculture. The results of the study revealed that undernutrition in the form of underweight, stunting, wasting along with inadequacy of protein and energy intake was found to be widely prevalent among children in different age group of *Bhil* tribe in Indore district of Madhya Pradesh.

The prevalence of under-nutrition was more among 1-4 year children (both boys and girls) as compared to 7-9 and 10-12 year children. Similarly, *Raj Gond* tribe of Madhya Pradesh (Sharma et al. 2006) was also reported with prevalence of under-nutrition (37.4% underweight, 46.3% stunted and 41.5% wasted) in 1-5 years of age group. High prevalence of under-nutrition was reported in other tribal children in India (Kumar et al. 1993; Maurya et al. 1997; Balgir et al. 2002; Rao et al. 2005; Mitra et al. 2007). The National Family Health Survey (NFHS II 1998-99) also reported high prevalence of under-nutrition

Table 2: Average intake of nutrients among *Bhil* children

Age group	Sex	<i>n</i>	Protein (gm/d)			Energy(K cal/d)		
			Intake	RDA	% Deficiency	Intake	RDA	% Deficiency
4-6	M	62	17	30	43.3	638	1690	62.2
	F	43	18	30	40.0	580	1690	65.7
7-9	M	40	28	41	31.7	974	1950	50.1
	F	51	26	41	36.6	846	1950	56.6
10-12	M	31	38	54	29.6	1427	2190	34.8
	F	27	34	57	40.4	1132	1970	57.5

(64.54% underweight, 59.9% stunting and 24.7% wasting) among preschool children of tribal community in Madhya Pradesh but comparatively lower than the present study. Apart from these, boys suffered more by under-nutrition than girls in early age group, which may be due to the influence of early childhood diseases among boys than girls. The consumption of protein and energy were also very low among *Bhil* tribal children than RDA of India, which may be reflected in high prevalence of protein energy malnutrition among children. Similarly, *Kamar* tribal children of Chhattishgarh (Mitra et al. 2007) were shown to have lower energy and protein intake than RDA but also comparatively very lower than the *Bhil* tribal children of present study.

The particular causes of under-nutrition among *Bhil* children were not identified from the present study. A lower socio-economic status of parents may be associated with the prevalence of under-nutrition among *Bhil* children. Therefore, there is a need to raise the health and nutritional status of these children by imparting necessary health education to children, parents and school teachers with locally available cheap sources of essential nutrients. Intervention programme through Government and Non-Government Organisations (NGOs) may be initiated for the overall development of *Bhil* tribal population with special focus on children.

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