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Correlates of childhood malnutrition in rural population of Kashipur, Uttarakhand

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ABSTRACT

The present study was planned to assess the nutritional status and food consumption pattern of the people in Udham Singh Nagar district, which included 100 families from four villages of the Kashipur block of the district. Results revealed a higher percentage of nuclear families (73%) in the area with average family size of 4.9 ± 2.4. Women literacy rate was 54%. Majority of people were engaged in farming and calculated average per capita income was Rs. 1021 ± 793. Only 66% families were living in poor housing and unhygienic sanitary conditions. Calculated mean dietary diversity score an index for variety in diet for the families was 6.4±0.8 against maximum of 11.0. The percent adequacy of most of the nutrients as computed against RDA (Recommended Dietary Allowance) was deficient. About 55 percent children between 0-5 years based on weight for age were moderately malnourished, whereas 7.69 percent children in the age group, 5-18 years were both wasted and stunted *i.e.* having less height for age and low weight for height. About 10.20% males and 7.24% females were in CED grade III category *i.e.* having BMI less than 16. Iron deficiency was found among 3% subjects based on clinical signs and symptoms and the estimates are not based on bio chemical parameters *i.e.* serum ferritin, otherwise it would have been higher. Common cold, cough, diarrhoea and fever were major infectious diseases in the area during the survey period (enough evidences exist for the plain malnutrition). Based on multiple correlation done the nutritional status of the people was found significantly correlated with dietary diversity score, housing and sanitary conditions, per capita income and formal education of housewives at p=0.01. Therefore, there is a need to create awareness on diet, hygiene and sanitation, small family norms and vocation oriented education for the girls so that they can add to the income of the family and nutritional status of the people may be improved.

Key Words : Dietary diversity score, Food consumption pattern, Diet

INTRODUCTION

Food consumption patter of people is influenced by many factors like socio economic status, culture, religion, education, ignorance, food beliefs and habits. In India about a half of

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the children are underweight and about 40% are stunted. The prevalence of underweight and stunting is high even among adolescents. About half of the adults and elderly suffer from chronic energy deficiency as measured by body mass index (<18.5). Researchers find that poor and undernourished communities, especially those of rural India, are trapped in a vicious cycle, where malnutrition is passed from generation to generation due to a number of inequalities. Uttarakhand is the newly formed 27th state of India, which was established on November 9, 2000. Its total geographical area is 53,484 km^2. As per census 2011, total population of Uttarakhand is 1.01 crores, which is increased from 84.89 lakh in 2001 census and the ratio of females: male is 963:1000. The region is sparsely populated, communication is difficult, and many areas are inaccessible. The region lags behind in agro industrial development, and the level of poverty is high. Earlier studies indicate that the health of the residents in this region is generally poor. Hilly terrain imposes a heavy burden on the health of the people and aggravates the problem of undernutrition. Keeping the above view in mind, the purpose of the present study is to examine the food habits, food consumption pattern and to assess the nutritional status of the people of Kashipur of Udham Singh Nagar district.

METHODOLOGY

The study was conducted among the rural population residing in nearby villages of Kashipur block of U.S. Nagar district. Four villages namely Manpur, Dhimerkhera, Dhanori Patti and Devipura-Kharagpur were selected from the block for the study. Among these, Dhimerkhera and Devi-Kharagpur are roadside villages and Manpur and Dhanori- Patti are interior villages. Total sample size of 100 families were selected randomly. All selected families were surveyed to collect the information regarding family ecology, food habits, food consumption pattern and nutritional status through different proformas developed.

Under family ecology, information regarding the family type, size and composition, socio-economic status of family, their food habits, housing conditions and sanitary practices was collected. To study the food consumption pattern of the families, average nutrient intake and percent adequacy for family members, dietary diversity score, dietary quality score and per capita per day consumption of various food items were calculated using 24 hour dietary recall method and food frequency questionnaire. To assess the nutritional status, anthropometric measurements including weight and height of people were classified into various grades of malnutrition using three different classification *i.e.* Gomez classification for children between 1-5 years, Water low classification for children between 5-18 years and BMI classification for adults. Prevalence of clinical signs of iron deficiency were observed. Incidence of some infectious diseases in the period of last 3 months till the date of study was recorded in order to assess the morbidity pattern in the area.

RESULTS AND DISCUSSION

Family ecology :

Information regarding the general profile of the families of all the four villages of Kashipur block is represented in Table 1. Regarding the family type, the percentage of nuclear families (73%) was higher as compared to joint (23%) and extended (4%) families. Average family

Table 1 : General profile of the rural families of district U S Nagar (Kashipur Block)

Items	Manpur		Dhimerkhera	
	No.	%	No.	%
Sex				
Male	89	57.05	61	52.14
Female	67	42.94	56	47.86
Family type				
Nuclear	24	80	18	90
Joint	6	20	2	10
Extended	-	-	-	-
Family size				
1 – 4	11	36.67	9	45
5 – 8	19	63.33	9	45
9 – 12	-	-	2	10
Type of house				
Kutcha	16	53.33	2	10
Pacca	11	36.67	7	35
Mixed	3	10	11	55
Toilet facility				
Present	16	53.33	8	40
Absent	14	46.67	12	60
Family income				
< 5000	27	90	15	75
5001-10000	2	6.67	5	25
10001-20000	1	3.33	-	-
>20,000	-	-	-	-
Food habits				
Vegetarian	10	33.33	3	15
Non- vegetarian	20	66.67	17	85
Educational status				
Illiterate	33	23.91	15	14.56
Primary	48	34.78	39	37.87
High School	41	29.71	35	33.98
Intermediate	10	7.25	4	3.88
Graduate and above	6	4.35	10	9.71
Occupation				
Only farming	-	-	2	10
Only service	1	3.33	-	-
Daily wage	18	60.01	5	25
Farming + livestock	1	3.33	1	5
Farming + service	1	3.33	1	5
Farming + livestock + service	1	3.33	-	-
Business + livestock + farming	-	-	-	-
Daily wage + livestock	5	16.67	7	35
Business + livestock	2	6.67	-	-
Service + livestock	1	3.33	-	-

size was calculated as 4.9±2.4 with highest percentage of medium size family (56%) and lowest percentage of large family size (9%).

The literacy rate of women was found to be 54% as compared to 46% for illiterate. Highest number of housewives *i.e.* 31% were educated up to primary level whereas least percentage *i.e.* 3% were educated either up to graduation or above.

The occupation of most the families of the villages under study was daily wage work *i.e.* 52 percent. The average per capita income of the families was 1021±793.

Results revealed that 66% of the families had poor whereas 23% and 11% of families had fair and good housing conditions and sanitary practices respectively.

Household food consumption pattern :

In reference to the food habits of the families, about 79 percent were non vegetarian, 16 percent were vegetarian and 5 per cent ova vegetarian. The food consumption pattern indicates that cereal and cereal products and oils and fats were consumed by 100% families on daily basis whereas no family was consuming sweets and desserts and meat, poultry and eggs on daily basis. Average dietary diversity score was calculated as 6.4±0.8. The dietary diversity score had significant positive correlation with nutritional status, income, education and nutrition knowledge of housewives (p=0.01). Average intake of energy and iron was below RDA for people in each age group. In contrast to it average intake of fat and calcium was below RDA in case of adolescent girls and children only. Protein intake was below RDA for adolescent girls and children in age group 1-3 years and 4-6 years. Average consumption of iron was below the RDA in case of all except adult males and for protein it was below RDA among adolescent girls, children (4-6 years) and children (7-10 years). Per capita consumption of cereals, pulses, milk and milk products and fruits was found to be below recommended value. On the other hand per capita per day consumption of vegetables was above the recommended value.

Nutritional status assessment :

Nutritional status of the household members was assessed by taking anthropometric measurements and classifying the subjects into various categories of malnutrition under different classification. According to Gomez classification, out of 33 children in 0-5 age group only 6 *i.e.* 18.18 percent were found to be normal whereas 27.27 and 54.55 per cent were falling into mild and moderate form of malnutrition (Fig. 1). In case of children between 5-18 years, 52 children were studied for assessment of their nutritional status and based on Waterlow classification, more girls (61.54 %) were found normal whereas about 7.69 percent children were identified as wasted and stunted both (Fig. 2). Based on the BMI classification, it was observed that more percentage of adult males (57.14) were normal than adult females (32.14 %). About 10.20 per cent males and 7.14 percent females were falling in the category of CED grade III (Fig.3) (Chronic Energy Deficiency). Results also revealed that 10.71 percent females but none of the males were obese.

Iron deficiency was found among 3% subjects based on clinical signs and symptoms and the estimates are not based on biochemical parameters *i.e.* serum ferritin otherwise it would have been higher. Bio-chemical estimation could not be conducted due to lack of co-

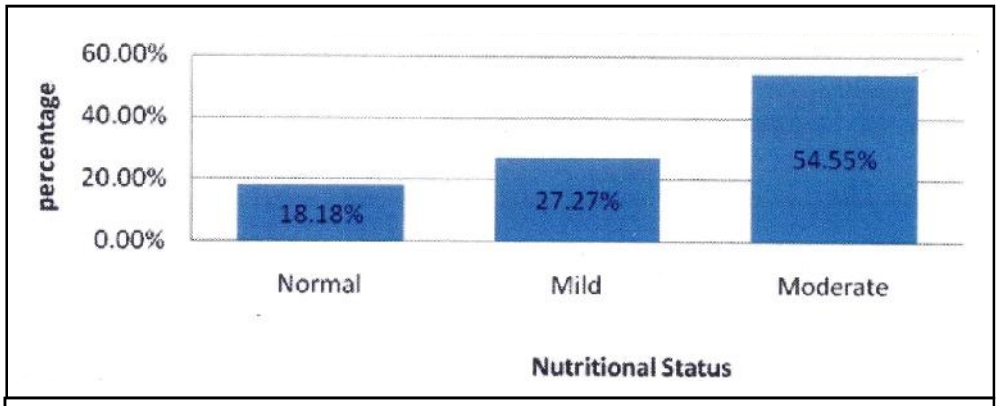

Fig. 1 : Nutritional status of children between 0-5 years (based on Gomez classification)

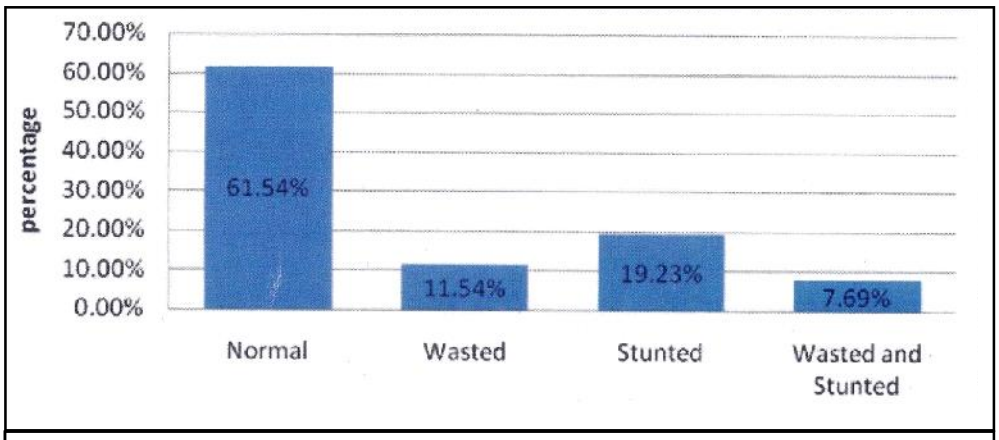

Fig. 2 : Nutritional status of children between 5-18 years (based on Waterlow classification)

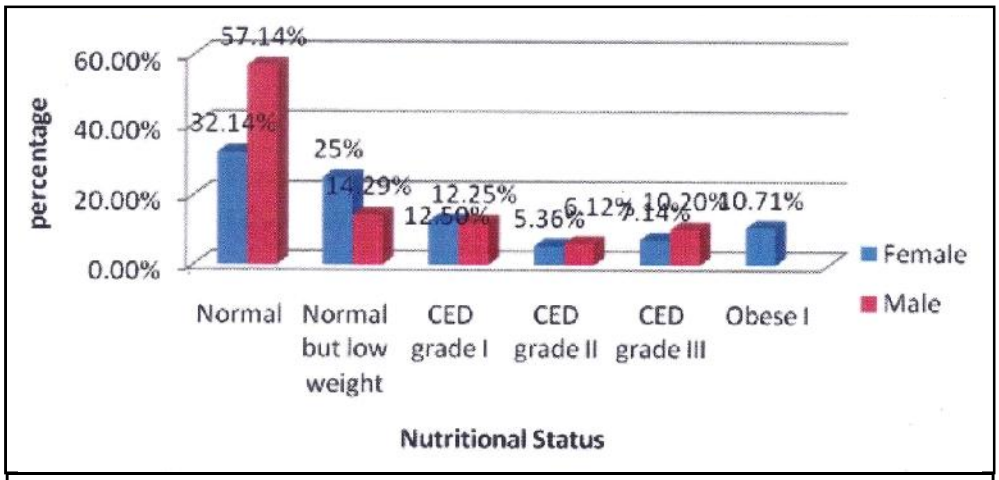

Fig. 3 : Nutritional status of adults (based on BMI classification)

operation shown by people. Among various infectious diseases common cold, cough, diarrhoea and fever were observed to occur with a high frequency whereas only a few cases of malaria and typhoid were seen.

Conclusion :

Based on multiple correlation done the nutritional status of the people was found significantly correlated with dietary diversity score, housing and sanitary conditions, per capita income and formal education of housewives at p=0.01. Therefore there is a need to create awareness on diet, hygiene and sanitation, small family norms and vocation oriented education for the girls so that they can add to the income of the family and nutritional status of the people may be improved.

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