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Health status of Gujjar Tribal Preschoolers of district Udhampur, J & K

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Abstract
The present study was undertaken to assess the nutritional status of Preschoolers belonging to Gujjar Tribe from Udhampur district of Jammu and Kashmir. The total sample for the study comprised of 100 preschooler-mother dyads selected from settled Gujjar families. Clinical signs and symptoms related to nutritional status was examined using checklist adapted from WHO Health Questionnaire comprising of nine major areas. Anthropometrical measurement including weight for age, height for age and weight for height were also assessed and later compared with WHO criterion (Z-score). The results of the study reveal that overall (68%) majority of sample preschoolers were found to be underweight, 60% were stunted and 77% were suffering from wasting. Majority of these children showed clinical signs of Protein Energy malnutrition. Vitamin and mineral deficiencies were also common including, Vitamin A deficiency characterised by paleness, dark circles and puffiness under eyes (52%). Vitamin C deficiency characterised by spongy, red and bleeding gums (57%) and Vitamin D deficiency characterised by bow legs (35%) and bone tenderness and joint pains (56%). Macronutrients and micronutrients deficiencies were also evident. Overall, results highlight that tribal gujjar children are highly susceptible to nutritional deficiencies and exhibit clinical signs of poor health.

Keywords: Tribal population, Preschoolers, Nutritional status, Malnutrition.

Introduction

According to WHO, Nutrition is defined as the intake of food, considered in relation to the body's dietary needs. Good nutrition – an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health. Inadequate nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity. The condition of health of a person that is influenced by the intake and utilisation of nutrients is termed as nutritional status of an individual (WHO, 2012) [16].

Nutritional status during childhood is important for human development as it affects every phase of human life and is helpful in determining their health, physical growth and development, academic performance and progress in life. All children have the right to adequate nutrition, which is essential for attainment of the highest standards of health. Moreover, good nutrition has been reported to be the corner stone for survival, health and development in the current and succeeding generations. Therefore, investment in childhood nutrition contributes not only to improving children's current welfare but to enhancing human's capacity in the long run. Global chronic undernutrition in children is highly prevalent and remains a big challenge in recent years. It has been estimated that 178 million and 112 million children aged less than five years (under-five children) are stunted (<-2 height-for-age z-scores) and underweight (<-2 weight-for-age z-scores) respectively in low-income countries. The improvement of childhood nutrition has become prime goal to reduce child mortality as undernutrition is an underlying cause of an estimated more than a half of all deaths of under-five children in developed as well as in developing countries. It has been recognized that socioeconomic factors, such as poverty, water, sanitation, illiteracy, and gender inequality are important determinants of nutritional outcomes in many low-income countries (Kamiya, 2011) [11].

UNICEF defines under nutrition "as the outcome of insufficient food intake (hunger) and repeated infectious diseases. Under nutrition includes being underweight for one's age, too short for one's age (stunted), dangerously thin (wasted), and deficient in vitamins and minerals (micronutrients)". The Maternal and Child Nutrition Study Group estimate that under nutrition, "including foetal growth restriction, stunting, wasting, deficiencies of vitamin A and zinc along with suboptimum breastfeeding- is a cause of 3.1 million child deaths and infant mortality in India (UNICEF, 2011) [15].

Among children in developing countries like India, malnutrition is an important factor contributing to illness and deaths. Malnutrition during childhood can also affect growth potential and the risk of morbidity and mortality in later years of life. Malnutrition among children is rampant among the developing countries. About half of all children deaths are associated with malnutrition, of which three quarters are linked to mild and moderate forms (Ruwali, 2011) [12]. Widespread poverty, illiteracy, malnutrition, poor maternal and child health services and ineffective coverage of national health and nutritional services have been traced out in several studies as possible contributing factors to dismal health conditions prevailing among the tribal population in India. In these communities, trend of malnutrition in past two decades has showed that improvements in nutritional status have not kept pace with the reduction in poverty and the current level of malnutrition is unacceptably high. About half of the tribal pre-school children are malnourished and are exposed to the high risk of functional impairments (Radhakrishna and Ravi, 2004).

Undernutrition and various morbidities go hand in hand, particularly in children. Nutritional status is a sensitive indicator of community health and nutrition. An attempt was made to assess the nutritional status of pre-school children of *Gond* tribal community in Madhya Pradesh and the findings revealed that the widespread prevalence of undernutrition among pre-school tribal children and highlight a need for an integrated approach towards improving the child health as well as nutritional status in this area (Rao *et al* , 2005) [11].
In 1998-1999, [6] the National Nutrition Monitoring Bureau (NNMB) had extensively studied the nutritional status of tribal adolescent children from nine Indian states mainly from southern India. Tribe specific studies also revealed undernourished conditions among Oraon, Santal and Munda communities in Bihar. A recent study carried by Chowdhury *et al* (2008) [2] showed that the prevalence of under-nutrition [stunting (17.9%), underweight (33.7%) and wasting (29.4%)] among Santal children of the rural area of Puruliya district of West Bengal was not an exception. The nutritional status of children was affected by school enrolment, socio-economic status, income constraints, type of family etc.

Research Methodology

Sample Description

The total sample size for the study comprised of 100 preschooler-mother dyads. All the selected preschoolers were aged 3-6 years, belonging to settled Gujjar families of Udhampur district. Half of the sample preschoolers were boys and rest were girls.

Locale of the Study

The entire sample was selected from different areas of Udhampur district, having high concentration of settled Gujjar tribe.

Sampling Technique

The sample for the present study was selected by random sampling technique. Udhampur district has 6 demarcated areas having high concentration of settled (non-nomadic) Gujjar tribe. Out of these, 3 areas were selected by lottery method. Once the areas were selected by snowball sampling, those Gujjar families were selected which had atleast one preschooler in the age group of 3-6 years along with his/her mother. Hence, a total of 100 preschooler-mother dyads were selected from settled Gujjar families to form the core group for the study.

Tools for the Study

The following tools were used for data collection.

Nutritional Status: Nutritional status was determined by use of Anthropometric measurements; Comparison of Anthropometric measurements with International Standards (WHO); Assessment of Clinical signs and Symptoms.

1. Anthropometric measurements weight for age, height for age and weight for height were assessed and later compared with WHO criterion (Z-score). Measuring tape and weighing balance was used for recording height and weight of the sample children respectively.
2. Clinical signs and symptoms related to nutritional status was examined using checklist adapted from WHO Health Questionnaire comprising of nine major areas, namely: General Appearance and Behaviour, Type of Hair, Facial Appearance, Eyes, Nails, Mouth, Type of Skin, Muscular Appearance (Apparent signs) and Neurological aspect (Non-Apparent signs).

Data Analysis

Both qualitative and quantitative methods were employed for data analysis. Appropriate statistical techniques were used where ever applicable to support the results.

Results and Discussion

Results of the present study are presented as follows:

Table 1: Incidence of Malnutrition (Z- score) among Gujjar children

Gradation of Nutritional status	Male (n=50)	Female (n=50)	Total (n=100)
Weight for age			
<-2.00 (Below normal) Underweight	32 (64%)	36 (72%)	68 (68%)
-2.00 to +2.00 Normal	18 (36%)	14 (28%)	32 (32%)
>+2.00 Above Normal	--	--	--
$\chi 2$ value= 0.735, p-value= 0.391, insignificant			

In developing regions of the world, malnutrition makes its principle impact on preschool children. The possible reason could be due to diet deficient in adequate amount of nutrients, poverty, lack of availability of suitable foods, life style, parental ignorance and illiteracy factor. Table 1 shows distribution of children according to standard deviation (SD) classification based on WHO criterion to distinguish the level of nutritional status. The maximum cases of underweight (<-2.00 Weight for age) were found among girls (72%) followed by 64% boys. Although 36% girls and 28% boys were found to be 'normal. None of them were in 'above normal' category. This indicates that most of the sample children were underweight due to nutritional deficiencies. Statistically there was no significant difference between underweight boys and girls. Contrary results were observed by Mitra *et al* (2007) and Nolla *et al.* (2014) [7] who while studying the nutritional status of preschool tribal children reported that boys were found to be more underweight than girls.

Table 2: Incidence of Malnutrition (Z- score) among Gujjar children

Gradation of Nutritional status	Male (n=50)	Female (n=50)	Total (n=100)
Height for age			
<-2.00 (Below normal) **Stunting**	28 (56%)	32 (64%)	60 (60%)
-2.00 to +2.00 **Normal**	22 (44%)	18 (36%)	40 (40%)
>+2.00 **Above Normal**	--	--	--
$\chi 2$ value= 0.667, p-value= 0.414, insignificant			

Results of Table 2 indicate that overall (60%) majority of sample children were stunted. The highest prevalence of stunting (<-2.00 Height for age) was found among females (64%) than males (56%).44% males and 36% females were falling in the normal category. None of the sample children were 'above normal'. Between male and female children, calculation of Chisquare indicates that there was no significant difference in the level of growth retardation. Contrary results were forwarded by Nolla *et al* (2014) [7] in a study to assess

nutritional status of preschool children in the Bangang rural community, Camroon.

Table 3: Incidence of Malnutrition (Z- score) among Gujjar children

Gradation of Nutritional status	Male (n=50)	Female (n=50)	Total (n=100)
Weight for height			
<-2.00 (Below normal) Wasting	37 (74%)	40 (80%)	77 (77%)
-2.00 to +2.00 Normal	13 (26%)	10 (20%)	23 (23%)
>+2.00 Above Normal	--	--	--
$\chi 2$ value= 0.508, p-value= 0.476, insignificant			

Table 3 shows that majority (80%) girls and (74%) boys were found to be wasted. 26% males and 20% females were normal whereas none of the sample children were above 'normal category' and there was no significant difference between wasting among girls and boys. On the contrary, the study carried by Mitra *et al* (2007) on nutritional status of Kamar tribsal children showed that boys were more wasted than girls and immediate dietary supplementation is necessary to improve the nutritional status of children.

The overall results indicate that more sample gujjar girls suffered by underweight, stunting and wasting as compared to boys. Further results also highlighted that malnutrition was very prevalent among tribal sample children both boys and girls largely due to dietary inadequacy of energy and protein intake in their diet. Similar results were noted by National Family Health Survey (NHFS-2) (1998-1999) [5] which also reported high prevalence of undernutrition among tribal children of Chhattisgarh.

Table 4: Clinical Manifestations of the selected Tribal children

Clinical Assessment	Male (n=50)			Female (n=50)			Total (n=100)		
General Appearance and Behaviour	**Completely Absent**	**Slightly Noticeable**	**Extremely Noticeable**	**Completely Absent**	**Slightly Noticeable**	**Extremely Noticeable**	**Completely Absent**	**Slightly Noticeable**	**Extremely Noticeable**
Underweight, Loss of subcutaneous fat, wasted muscles, sunken or hollow cheeks.	--	40 (80.00%)	10 (20.00%)	--	42 (84.00%)	08 (16.00%)	--	82 (82.00%)	18 (18.00%)
Pallor	08 (16.00%)	37 (74.00%)	05 (10.00%)	04 (08.00%)	42 (84.00%)	04 (08.00%)	12 (12.00%)	79 (79.00%)	09 (09.00%)
Hair, face and eyes									
Thin and sparse, dry, brittle, and lustreless hair.	15 (30.00%)	26 (52.00%)	09 (18.00%)	12 (24.00%)	32 (64.00%)	06 (12.00%)	27 (27.00%)	58 (58.00%)	15 (15.00%)
Stiff and hard to touch, fragile, weak and lacking delicacy.	22 (20.00%)	20 (40.00%)	08 (10.00%)	16 (32.00%)	28 (56.00%)	06 (12.00%)	38 (38.00%)	48 (48.00%)	14 (14.00%)
Moon face	23 (46.00%)	19 (38.00%)	08 (16.00%)	25 (50.00%)	15 (30.00%)	10 (20.00%)	48 (48.00%)	34 (34.00%)	18 (18.00%)
Prominent paleness	16 (32.00%)	28 (56.00%)	06 (12.00%)	12 (24.00%)	33 (66.00%)	05 (10.00%)	28 (28.00%)	61 (61.00%)	11 (11.00%)
Vitiligo	35 (70.00%)	15 (30.00%)	--	40 (80.00%)	10 (20.00%)	--	75 (75.00%)	25 (25.00%)	--
Redness, Watery and Irritable eyes.	20 (40.00%)	25 (50.00%)	05 (10.00%)	15 (30.00%)	32 (64.00%)	03 (06.00%)	40 (40.00%)	57 (57.00%)	08 (08.00%)
Dark circles and Puffiness	20 (40.00%)	27 (54.00%)	03 (06.00%)	23 (36.66%)	25 (50.00%)	02 (13.33%)	43 (43.00%)	52 (52.00%)	05 (05.00%)
Teeth and gums									
Dental carries and mottled enamel	05 (10.00%)	36 (72.00%)	09 (18.00%)	03 (06.00%)	40 (80.00%)	07 (14.00%)	08 (08.00%)	62 (62.00%)	16 (16.00%)
Dental fluorosis	15 (30.00%)	25 (50.00%)	10 (20.00%)	12 (24.00%)	28 (56.00%)	10 (20.00%)	27 (27.00%)	53 (53.00%)	20 (20.00%)
Brittle teeth	24 (48.00%)	21 (42.00%)	05 (10.00%)	20 (40.00%)	27 (54.00%)	03 (06.00%)	44 (44.00%)	48 (48.00%)	08 (08.00%)
Spongy and bleeding	14 (28.00%)	27 (54.00%)	09 (18.00%)	12 (24.00%)	30 (60.00%)	08 (16.00%)	26 (26.00%)	57 (57.00%)	17 (17.00%)
Redness and	18	25	07	15	32	03	33	57	10

swelling	(36.00%)	(50.00%)	(14.33%)	(30.00%)	(64.66%)	(06.00%)	(33.00%)	(57.00%)	(10.00%)
Skin and nails									
Xerosis and paleness	05 (10.00%)	33 (66.00%)	12 (24.00%)	07 (14.00%)	30 (60.00%)	13 (26.00%)	12 (12.00%)	63 (63.00%)	15 (15.00%)
White patches	35 (70.00%)	15 (30.00%)	--	39 (78.00%)	11 (22.00%)	--	74 (74.00%)	26 (26.00%)	--
Pellagra	42 (84.00%)	08 (16.00%)	--	40 (80.00%)	10 (20.00%)	--	82 (82.00%)	18 (18.00%)	--
Brittle and pale nail bed.	15 (30.00%)	27 (54.00%)	08 (16.00%)	17 (34.00%)	30 (60.00%)	03 (06.00%)	32 (32.00%)	57 (57.00%)	11 (11.00%)
Muscles, skeleton, abdomen and subcutaneous tissues									
Wasted and weak muscles.	10 (20.00%)	30 (60.00%)	10 (20.00%)	08 (16.00%)	26 (52.00%)	16 (32.00%)	18 (18.00%)	56 (56.00%)	26 (26.00%)
Sore and painful.	08 (16.00%)	28 (28.00%)	14 (28.00%)	13 (26.00%)	25 (50.00%)	12 (24.00%)	21 (21.00%)	53 (53.00%)	26 (26.00%)
Bow legs	30 (60.00%)	15 (30.00%)	05 (10.00%)	26 (52.00%)	20 (40.00%)	04 (08.00%)	56 (56.00%)	35 (35.00%)	09 (09.00%)
Bone tenderness and Bone/Joint pain	15 (30.00%)	24 (48.00%)	11 (22.00%)	12 (24.00%)	32 (64.00%)	06 (12.00%)	27 (27.00%)	56 (56.00%)	17 (17.00%)
Odema	38 (76.00%)	12 (24.00%)	--	35 (70.00%)	15 (30.00%)	--	73 (73.00%)	27 (27.00%)	--
Pot belly	35 (70.00%)	15 (30.00%)	--	32 (64.00%)	18 (36.00%)	--	67 (67.00%)	33 (33.00%)	--
Neurological									
Diminished reflexes and Dementia	25 (50.00%)	25 (50.00%)	--	20 (40.00%)	30 (60.00%)	--	45 (45.00%)	55 (55.00%)	--

Clinical signs and symptoms of malnutrition can be valuable aids in detecting early nutritional deficiencies among children. The sooner the diagnosis of nutritional status is made in individuals and in tribal populations the sooner clinical public health intervention programs can be formulated. Table 4 depicts the prevalence of clinical signs and symptoms of malnutrition among sample tribal children. Majority of the sample children showed clinical signs of Protein Energy malnutrition. Overall result reveal that most children were underweight, had diminished subcutaneous fat, sunken or hollow cheeks (82%), wasted and weak muscles (56%) along with sore and painful muscles (53%). Vitamin and mineral deficiencies were also common in tribal children including Vitamin A deficiency characterised by paleness, dark circles, and puffiness under eyes (52%). Moreover, most of the children (57%) had red, watery and irritable eyes. Vitamin C deficiency characterised by spongy, red, swelled and bleeding gums (57%) and Vitamin D deficiency characterised by bow legs (35%) and bone tenderness and joint pains (56%). Prominent paleness (61%) and moon face (34%) was also common in sample children. Pot belly (33%) was also prominent in children. Macronutrients like calcium and phosphorus and micronutrients including iron, zinc and fluoride were also deficient in their diet leading to dental carries and mottled enamel (62%), dental fluorosis (53%), brittle teeth (48%),brittle and pale nail bed (57%), xerosis and paleness of skin (63%) white patches on the skin (26%), pellagra (18%), odema (27%), thin, sparse, dry and brittle hair (58%), stiff, hard, fragile and lusterless hair (48%) and diminished reflexes and dementia (55%). However, prevalence of malnutrition was found to be more evident in females than males. The results also highlight that tribal gujjar children are highly susceptible to nutritional deficiencies that can further lead to reduced immunity, increased responsiveness to disease and impaired mental and physical development. Similar results were found by Singh *et al* (2006) who assessed the nutritional status of pre-school children aged 0-5 years from a rural population in a desert area facing drought conditions very frequently.

Conclusion

Food has always been a critical need for the survival of the human species (Ake-Tano *et al* , 2011) [1]. Good nutrition helps to improve child survival, to promote healthy growth and development, to contribute to better cognitive and economic development. It also reduces morbidity and mortality rate, and the risk of chronic diseases such as cardiovascular disease, diabetes, kwashiorkor, marasmus, hypertension, even in adulthood (OMS, 2010) [8]

Child malnutrition is a widespread public health problem, worldwide. Among children in developing countries like India, malnutrition is an important factor contributing to illness and deaths. Malnutrition during childhood can also affect growth potential and the risk of morbidity and mortality in later years of life. Malnutrition among children is rampant among the developing countries. About half of all children

deaths are associated with malnutrition, of which three quarters are linked to mild and moderate forms (Ruwali, 2011) [12].

Tribals are one of the most exploited and deprived section of the population in Indian society. On all indicators of development, they remain the most excluded despite the fact that various policies and programmes have been pursued for their upliftment in the post-Independence India. Needless to say that exclusion from fruits of development has adversely affected the quality of life of the tribal people. Tribal children are no exception in this regard (UNICEF, 2010).

Over the last few decades, Gujjars like many other nomadic groups have had to deal with rapid changes to their way of life; while a large section of top-down policies remain highly unsympathetic to them. It is deeply unfortunate that the systemic inequities and injustices have deprived these communities of their fundamental human rights such as the right to access basic medical facilities, availability of adequate quantity and quality of food etc. Gujjars have remained dominantly ignored in all aspects of development (UNESCO, 2011) [14].

The findings of the present study highlight that malnutrition was highly prevalent in sample gujjar children in terms of anthropometric and clinical aspects. Majority of preschoolers were suffering from nutritional deficiencies characterised by Protein energy malnutrition, vitamin and mineral deficiencies and micronutrients were also found to be deficient in their diet. Further, nutritional status of sample girls was poorer than boys when compared.

This piece of work suggests that there is a strong need to develop nutritional packages based on the locally available diet and feeding habits of pre-school children which would provide them adequate energy, protein and adequate quantity of nutrients which would further help in improving their overall nutritional status. It is high time that screening and identification of more children should be done as tribal population is at a higher risk of undernutrition probably because of their dependence on primitive agricultural practices, feeding habits, irregularity of food supply and food beliefs that may directly or indirectly influence their nutritional status. Food supplements can be given to tribals for preventing early clinical signs and symptoms of malnutrition. It is highly recommended that essential commodities can be provided at an affordable cost to tribals. It also suggests that creating awareness through intervention schemes about nutritional knowledge is essential to improve the nutritional status of tribals.

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