

ASSESSMENT OF NUTRITIONAL STATUS OF ANGANWADI CHILDREN

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ABSTRACT

Good nutrition helps to improve child survival, promote healthy growth and development and contribute to better cognitive development. This study aims to assess the nutritional status of Anganwadi children in Dantiwada Taluka. Study was done amongst 30 Anganwadi centers of Dantiwada Taluka selected by simple random sampling. A total of 300 children of age 2 to 6 years were enrolled in the study. All mothers/informants were interviewed, and anthropometric measurements such as weight, height, mid upper arm circumference (MUAC), chest circumference and head circumference were taken by using appropriate technique. Data were analyzed using SPSS and Pearson's correlation to find the association between two qualitative variables. With respect to BMI-for-age, out of 300 Anganwadi children, the maximum number of Anganwadi children 61.30 per cent were normal followed by 35.30 per cent being underweight, 2.30 per cent were overweight and only 1.00 per cent were obese. A positive correlation was observed between the nutritional status of the children and the parents' educational level and family monthly income. The study concludes that skill-oriented training must be imparted to mothers for effective utilization of locally available eatable materials to prepare nutritious and balanced diets for children, create awareness programme and educate them to improve their nutritional status further.

Keywords: malnutrition, anganwadi children, anthropometric measurement, nutritional status

INTRODUCTION

Malnutrition in India has been called 'The Silent Emergency' (USAID India, 2017). It generally affects everyone in a community, but infants and children are the most vulnerable because of their high nutritional needs for growth and development. Nutrition is vital to children's mental, physical and emotional development. It is a crucial determinant of good health and is critical for survival, good quality of life and well-being.

The first six years of life is the most crucial period in a child's growth and development, as (40%) of physical and (80%) mental development is believed to occur during these years. (Senthilkumar, 2018).

According to the WHO report, nearly two of three preschool children in India are malnourished. Gujarat is ranked 17th among 29 states for infant mortality and 25th by underweight prevalence among under-five children.

According to the National Family Health Survey (2019-21), the prevalence of stunting in children under age five is the highest in Meghalaya (47%), followed by Bihar (43%) and Uttar Pradesh and Jharkhand (40% each). It is lowest in Puducherry (20%) and Sikkim (22%). Bihar has the highest level of underweight children (41%). Maharashtra has the highest level of wasting (26%). As per the UNICEF report

(2015) in India, 25 per cent of newborns are underweight, 33 per cent are exclusively breastfed for the first six months and nearly 50 per cent of children under five years of age suffer from moderate or severe malnutrition.

The Government of India has implemented several programs along with the WHO and UNICEF to improve the health status of children. The Integrated Child Development Services (ICDS) is a large program started with the main objective of improving health, nutrition, and development of children below six.

Moluguri *et al.* (2019) conducted a study on the health and nutritional status of children in rural and urban ICDS projects in Karimnagar observed that the high prevalence of malnutrition among children in both urban and rural areas warrants urgent attention. ICDS projects should be periodically studied to evaluate the impact of interventions.

Suganya *et al.* (2017) assessed the nutritional status and preference of nutritional supplements- either Hot Cooked Meals (HCM) or Take Home Ration (THR) among Anganwadi children in Puducherry; they found that the prevalence of underweight, stunting and wasting were (28%), (28%) and (38.5%) respectively and it was significantly higher among THR utilizers (74%), (60%) and (53%) respectively than those receiving HCM (25%), (36%)

and (23%) and concluded that HCM was preferred more than THR. The children receiving HCM were better nourished than THR utilizers.

OBJECTIVE

To assess the nutritional status of Anganwadi children in Dantiwada Taluka.

METHODOLOGY

The present study was conducted in the Dantiwada Taluka of Banaskantha District of Gujarat State. Out of 129 Anganwadies, 30 Anganwadies were selected randomly by the simple random sampling method and tenrespondents were selected from each Anganwadi for conducting the study. A total of 300 respondents were selected by multistage random sampling for the study. The tools used for this study were;

Tool 1 : A questionnaire was formulated to elicit information regarding social-economic profiles like age, gender, religion, type of family, birth order of child, family size, education of mother, education of father, occupation of mother/father, annual incomeand place of residence.

Tool 2 : The samples anthropometric measurements like weight, height, head, chest and mid-arm circumference were recorded using standardized tools and techniques.

Tool 3 : All the subjects were clinically examined from head to toe to assess the presence or absence of clinical signs as

suggested by Jelliffe (1966). Clinical signs were examined by checking superficially the organs like; face eyes, lips, teeth, tongue, nails, hair and skin.

Tool 4 : In the present study, through the 24-hour recall method, the amount of raw ingredients used for cooking and the total amount of food consumed by the individuals were measured using the standard cups and utensils Kapil and Sachdev (2004) and recorded. Nutrients available were calculated and compared with the suggested allowances of ICMR (ICMR 2010).

Analysis of Data

The Nutritional status of Anganwadi children was assessed by using the Indian Academy of Pediatrics (IAP) classification based on weight for age and according to Rao index, BMI classification based on percentile range. The Kanawati index was used to classify midupper arm circumference/head circumference and chest circumference/head circumference. Anthropometric measurements like weight, height, and head circumference, chest circumference and mid upper arm circumference were recorded for all subjects. The values were compared with IAP (1972) and CDC (2000) Standards. Percentage, mean and standard deviations were used for anthropometric measurements and the correlation coefficientwas used for analyzing the association between socio-economic status variables and nutritional status.

RESULTS AND DISCUSSION

Table 1: Personal and socio-economic variables of Anganwadi children

(n=300)

Sr. No.	Personal and socio-economic variables		f	%
1	Age	2 to 3 yrs	113.00	37.70
		3 to 4 yrs	81.00	27.00
		4 to 5 yrs	72.00	24.00
		5 to 6 yrs	34.00	11.30
2	Gender	Boys	150.00	50.00
		Girls	150.00	50.00
3	Religion	Hindu	290.00	96.70
		Muslim	10.00	03.30
4	Family type	Joint	161.00	53.70
		Nuclear	139.00	46.30
5	Family size	Small family (up to 4 members)	18.00	06.00
		Medium family (5 to 8 members)	248.00	82.70
		Large family (above 8 members)	34.00	11.30
6	Family income	₹ 1,000-2,499	04.00	01.30
		₹ 2,500-4,999	99.00	33.00
		₹ 5,000-9,999	124.00	41.30
		₹ 10,000-19,999	55.00	18.30
		₹ 20,000-49,999	16.00	05.30
		> ₹ 50,000	02.00	0.70

Age wise distribution showed that 37.70 per cent belonged to the 2 to 3 year age group while 27 per cent belonged to 3 to 4 year age group, followed by the age group 4 to 5 years 24 per cent and the remaining 11.33 per cent were in age 5 to 6 years. Out of the total Anganwadi children, 50.00 per cent were girls while 50.00 per cent were boys.

It is evident from Table 1 that, most of the Anganwadi children (96.70 %) were Hindus and few (03.30%) were Muslims. Similar religious composition of the study population was also observed by Harishankar *et al.* (2004).

The data revealed that more than half (53.70%) of the

Anganwadi children lived in a joint family while; less than half (46.30%) lived in nuclear families. The majority of the children (82.70%) belonged to medium size family while only 11.30 per cent were from large families and a few 6.00 per cent were from small family size.

Results from Table 1 showed that very few families (6.00%) were earning 20,000-50,000 Rs monthly while less than half (41.30%) of the Anganwadi children's families had monthly income Rs 5,000-9,999, 33.00 per cent families earned 2,500-4,999 Rs monthly, 18.30 per cent families earned 10,000-19,999 Rs monthly and, 1.30 per cent families earned 1,000-2,499 Rs monthly.

Table 2: Distribution of parents according to their level of education and occupation

(n=300)

Sr. No	Education of parents	Mother		Father	
		f	%	f	%
1	Illiterate	150.00	50.00	68.00	22.70
2	Primary	105.00	35.00	117.00	39.00
3	Secondary	28.00	09.30	63.00	21.00
4	Higher secondary	10.00	03.30	28.00	09.30
5	Graduate	06.00	02.00	24.00	08.00
6	Post graduate	01.00	0.30	-	-
	Family occupation	f		%	
1	Farming only	05.00		01.70	
2	Farming + animal husbandry	122.00		40.70	
3	Farming + farm labour	87.00		29.00	
4	Farming + business	12.00		04.00	
5	Farming + service	13.00		04.30	
6	Only service	14.00		04.70	
7	Other	47.00		15.70	

Table 2 shows that half of the mothers (50.00%) were illiterate. A total of 35.00 per cent of mothers were educated up to the primary level, 9.30 per cent education up to the secondary level, 3.30 per cent were educated up to the higher secondary level, 2.00 per cent mothers were educated up to graduate level and only 0.30 per cent mothers were educated up to graduate level. The education level of Anganwadi children's fathers was found that 22.70 per cent were illiterate while 39.00 per cent, 21.00 per cent, 9.30 per cent and 8.00 per cent were educated up to primary level, secondary level, higher secondary level and graduate level respectively. It reveals that the father's education level was

better than the mother's. Data shown in Table 2 indicates that the families of the Anganwadi children were primarily involved in farming cum animal husbandry (40.70%). While 1.70 per cent engaged in farming only because farms were small and agriculture mainly depended on rain. A total of 29.00 per cent of families were involved in farming along with farm labor, 4.00 per cent in farming along with business, 4.30 per cent in farming along with service, 4.70 per cent were solely doing services and 15.70 per cent were involved in other activities. Thus, Farming and animal husbandry were the prime occupations of Anganwadi children's families and the source of income.

Table 3: Distribution of Anganwadi children according to Body Mass Index (BMI) classification and Academy of pediatrics classification (n=300)

BMI		Boys		Girls		Total	
(kg/m ²)		f	%	f	%	f	%
Under Weight (<5 th percentile)		57.00	38.00	49.00	32.70	106.00	35.30
Normal (5 th to 85 th percentile)		87.00	58.00	97.00	64.70	184.00	61.30
Over Weight (85 th to 95 th percentile)		05.00	03.30	02.00	01.30	07.00	02.30
Obese (>95 th percentile)		01.00	0.70	02.00	01.30	03.00	01.00
Indian Academy of Pediatrics (IAP) classification							
Stage of Malnutrition		Boys		Girls		Total	
Weight for age (%)		f	%	f	%	f	%
Normal	>80%	76.00	50.70	68.00	45.30	144.00	48.00
Grade I	70-80%	46.00	30.70	56.00	37.30	102.00	34.00
Grade II	60-70%	23.00	15.30	20.00	13.30	43.00	14.30
Grade III	50-60%	04.00	02.70	05.00	03.30	09.00	03.00
Grade VI	<50%	01.00	0.60	01.00	0.70	02.00	0.70

Sources- CDC (2000), IAP (1972)

With respect to BMI-for-age, it was found that a maximum number of Anganwadi children 184 (61.30%) were of the normal category. Total 106 (35.30%) were categorized as underweight, 7.00 (02.30%) were overweight, and 3.00 (01.00 %) were obese.

The results of the present study are supported by Madhusudhan and Khargekar (2020) who found that a maximum number of Anganwadi children 283 (56.60%) were in the normal category. 207 (41.40%) were categorized as underweight, 3 (0.60%) were at risk of being overweight, and 7 (1.40%) were overweight.

The data shows the classification of Anganwadi children according to the Indian Academy of Pediatrics (IAP) classification of weight for age; nearly half (48.00%) of children were in the normal category and had average weight. Grade I category which indicates mild malnutrition was found in 34.00 per cent of children. Grade II category indicating moderate malnutrition was seen in 14.30 per cent of children; only 3.00 per cent and 0.70 per cent of children had Grade III and Grade VI category means severe malnutrition, respectively.

Table 4: Nutritional grades based on anthropometric measurements of Anganwadi children (n=300)

Nutritional Grades	MUAC		MUAC / Hc		Cc / Hc		BMI	
	f	%	f	%	f	%	f	%
Normal	278.00	92.70	107.00	35.70	275.00	91.70	180.00	60.00
Mild	-	-	175.00	58.30	-	-	-	-
Moderate	21.00	7.00	16.00	5.30	-	-	-	-
Severe	01.00	00.30	02.00	00.70	-	-	-	-
PEM	-	-	-	-	25.00	8.30	120.00	40.00

Table 4 represents nutritional grades based on anthropometric measurements of Anganwadi children shows, which were normal on mid- upper arm circumference (94.70%). While, 7.00 per cent were found moderate malnutrition and only 0.30 per cent severe malnutrition. Based on head circumference only 35.70 per cent were normal. Most of the Anganwadi children were found to have PEM, amongst

which 58.30 per cent, 5.30 per cent and 0.70 per cent showed mild PEM, moderate PEM and severe PEM, respectively. Based on chest circumference (91.70%) belonged to normal category and 8.30 per cent belonged to the PEM category; based on the Rao index 60.00 percent belonged to the normal category and 40.00 per cent Anganwadi children belonged to the PEM category.

Table 5: Average nutrient intake by Anganwadi children per day

(n=300)

Sr. No.	Nutrients	RDA ICMR (1990)	Average nutrient intake
1	Energy (kcal)	1060 – 1350	1050.50
2	Protein (g)	16.70 – 20.10	14.50
3	Fat (g)	25 – 27	20.50

Cereals and oil were the significant energy sources in the Anganwadi children's diet. The respondent's average total energy and fat intake was 1050.50 kcal and 20.50g all day which was considerably adequate with RDA (1060-1350 kcal/ day and 16.70 – 20.10g/day), respectively.

The average amount of protein intake in the daily diet of Anganwadi children was 14.50 g/day which was average compared to RDA (16.70-20.10 g/day). This might be due to the moderate consumption of pulses, milk and milk products and animal proteins.

Table 6: Coefficient correlation between personal and socio-economic variable with nutritional status of Anganwadi children

(n=300)

Sr. No.	Socio economic status variables	Height	Weight	MUAC	CC	HC	BMI
X ₁	Age	0.749**	0.579**	0.122*	0.521**	0.436**	0.301*
X ₂	Sex	0.019	0.009	-0.077	-0.098	-0.129*	-0.056
X ₃	Family type	-0.014	-0.021	-0.017	-0.031	-0.047	-0.031
X ₅	Family Size	0.101	0.059	0.012	0.019	0.107	-0.087
X ₆	Education of mother	0.079	0.126*	0.080	0.096	0.080	0.032
X ₇	Education of father	0.100	0.162**	0.102	0.140*	0.134*	0.047
X ₈	Family occupation	-0.032	0.024	0.059	0.018	-0.043	0.080
X ₉	Family monthly income	0.157**	0.212**	0.080	0.103	0.120*	0.028

Table 6 shows that different personal and socio-economic status variables correlate with anthropometric parameters. It was observed that the age of the child had a positively high significant relationship with all the anthropometric parameters. Whereas the sex of the child had a negatively significant relationship with head circumference.

Similarly, family type, size and occupation did not significantly correlate with anthropometric measurement. But it is interesting to note that the mother's education showed a significant positive correlation with the child's weight, and the father's education showed a significant positive correlation with the weight, chest circumference and head circumference of the Anganwadi children. The family's monthly income shows a highly positively significant relationship with the height, weight and head circumference of the Anganwadi children.

CONCLUSION

The nutritional status of Anganwadi children of Dantiwada Taluka was good and belonged to medium socio-economic status. This study showed that both the mother's and father's education level and monthly income of the family positively impact the nutritional status of the Anganwadi children. Children were taking five meals in a day and their average nutrient intake was sufficient compared to RDA, still, for further improvement in nutritional status of

Anganwadi children, it is recommended that skill-oriented training should be imparted to mothers for effective utilization of locally available eatable materials to prepare nutritious and balanced diets for children as well as create awareness programme and educate them for further improvement in nutritional status.

CONFLICT OF INTEREST

All authors declare that they have no conflict of interest

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