Nutritional status and IQ level of tribal adolescent girls of Vankal Mangrol taluka of Surat district

NAGIN H. GAMIT

Adolescences a significant period of human growth and maturation. Growth may be cumulative indicator of nutritional status and IQ level of 50 tribal adolescent girls of 13-18 years of age in Kasturba hostels of Vankal Mangrol Taluka of Surat District. Data on anthropometric measurements (height and weight) were collected to assess nutritional status revealed that height of subjects varied from 131.67 cm to 154.55 cm which were 83.81-94.41% of standard (NCHS). According to weight all 13-15 years of girls had moderate grade malnutrition while 16-18 years of girls, 65% had moderate between 91-114 for 13-18 years girls, which was in normal IQ range and only 4% girls were below normal IQ. The study revealed that height and weight of girls were positively high degree and moderately correlated with IQ level of Kasturba hostel Vankal Mangrol Taluka of Surat District girls, as height and weight increases with IQ.

Key Words : IQ level, Nutritional Status, Adolescent.

INTRODUCTION

Adolescence, a period of transition between childhood and adulthood, occupies a crucial position in the life of human beings. Major physical changes in the body size at puberty during the entire 4 year growth spurt, height increases about 25% and weight almost doubles. Boys continue to grow more rapidly than girls, reaching their adult size at about 19 or 20, as compared with 18 for girls. Increase in height as well as weight occur during this period. About 25% of an individual's attained height is achieved during adolescence as a result of the adolescent growth spurt that marks the end of growth in height, variations in adolescent body size and the timing of maturational events are determined genetically in populations whose environmental allows full expression of the genotype, where this is limited by environmental constraints, including nutrition, the observed growth and maturation during adolescence, reflect environmental rather than inherited potential. It is now clear that growth differences among groups are also related to nutritional status, socio-economic and other factors.

The pattern of growth and the physical state of the body though genetically determined are profoundly influenced by diet and nutrition. Hence, anthropometric measurements are useful criteria for assessing nutritional status. It should be remembered that the other factors such as frequent illness due to infection or infestation may also affect the growth and physical status of the body such as weight. Height-weight is the simplest measurement of growth and nutritional status. The value of measurement of body height for older children and adults in nutritional assessment is well recognized.

Nutritional deficiencies prior to school entry have the potential to impact upon cognitive outcomes in school aged and adolescent children. Children with nutritional deficiencies are particularly susceptible to the moment to moment metabolic changes that impact upon cognitive ability and performance of the brain. Treatment with nutritional supplements can result in improved performance.

Malnutrition may stunt growth in height and result in either an endomorhpic or and ectomorphic body type. Malnutrition affects on health and children are more susceptible to diseases of all kinds. They tend to be depressed, irritable and nervous.

———●— **AUTHOR FOR CORRESPONDANCE** —●———

NAGIN H. GAMIT, Shri & Smt. P.K. Kotawala Arts College, PATAN, NORTH GUJARAT (GUJARAT) INDIA
Email: artspatan@yahoo.co.in

If malnutrition occurs in the early years of life, it affects the development of the brain cells and thus lowers the intellectual capacities of the child. If it occurs later, it affects the child's learning abilities.

According to the ICRW/USA (1994), 32% of the adolescents were reported to be stunted. The gender difference was high with more girls being stunted (45%) as compared to boys (20%), this difference is explained by the deep-rooted gender discrimination.

NNMB conducted a repeat survey during 1996-97 on adolescent girls; the data were collected, analyzed to assess nutritional status and also compared with the data obtained in 1975-79 from the same villages. There was a secular change in height and weight observed with an increase of about 2.5 to 3.5cm and 1 to 1.5kg, respectively. The extent of under nutrition as measured by weight for age and stunting (low height for age) also showed a decline during the current survey as compared to 1975-79.

There are studies that claim that average adult height of both male and female population in many countries has increased over the years. Bowles (1932) and Meredith (1963) detected 3.4-3.5cm increase in one generation among the American adult males. Kimura and Yamajaki (1961) found more than 2cm during 25 years.

In india, Madhvan *et al.* (1964) and Rao (1991) have shown positive growth trend in different areas. All these evidence confirm the claim that there has been improvement in the quality of life and it is because people are now increasingly assessable to better medical facilities and nutrition. The tribal's are the oldest settlers. The Hindi word Adivasi, means, the original habitant. There are more than 400 groups in Indian society which are officially designated as the scheduled tribe, constitute about 8% of the country's population. There are innumerable tribes in India, which are scattered all over the length and breadth of the country. The density of tribal population also varies from one region to the other. Thus, the present study was planned to assess nutritional status and IQ level of tribal adolescent of Kasturba girls hostel of Vankal Mangrol taluka of Surat district.

Objectives :

To assess the nutritional status and IQ level of 13-18 of tribal adolescent girls of Vankal Mangrol taluka of Surat district.

To study the relationship between intellectual development and nutritional status of 13-18 years of tribal adolescent girls of Vankal Mangrol taluka of Surat district.

METHODOLOGY

This study was conducted in Vankal Mangrol taluka of Surat district. A Sample of 50 tribal adolescent girls, age ranges 13-18 years from tribal sub plan Kasturba hostels were selected by purposive random sampling. The list of hostels was procured from tribal area development office Surat Gujarat. Age of girls was taken from hostel records with the help of hostel warden.

Nutritional status of tribal adolescents was evaluated by anthropometric measurements like weight (kg) and height (cm) measured by using weighing balance and non stretchable measuring steel tape, and compared with 50" percentile of NCHS standard for 13-18 years of girls. The prevalence of malnutrition was assessed as per the classification suggested by Mc Laren (1976).

IQ level was measured by "test of general mental ability", which was prepared and standardized by Prof. Mohan Chandra Joshi, IQ test was administered individually to each girl and scoring procedure was applied as per manual.

Statistical analysis :

Mean, standard deviation and co-efficient of correlation was used.

OBSERVATIONS AND ASSESSMENT

It was concluded by data that tribal adolescent girls divided in two groups in which 24 girls (48%) were in 13-15 years and 26 girls (52%) were in 16-18 years age group.

The mean height and weight of the Kasturba hostel adolescent girls aged 13-18 years are given in Table 1 and 3 and grade of malnutrition of height for age and weight for age are given in Table 2 and 4 for Vankal Mangrol Taluka of Surat District. The average height (Table 1) of 13,14,15,16,17, and 18 years girls were 131.67, 136.75, 142.10, 146.68, 151.75 and 154.55cm. Comparison of height with NCHS standard clearly indicates that 13-15 year girl's height between 83-87% of NCHS standard and 16-18 years girl's height between 90-94% of NCHS standard. From table the mean height of 13-18 years of girls

Table 1. Anthropometric measurement (height) of tribal adolescence girls (13-18 years) of Vankal Mangrol taluka of Surat district

Age (years)	NCHS standard (cm)	N		SE	% of standard NCHS
13	157.1	6	131.67	0.80	83.81
14	160.4	8	136.75 ±1.75	0.62	85.26
15	161.8	10	142.10±1.45	0.46	87.82
16	162.4	7	146.86±2.19	0.83	90.43
17	163.1	8	151.75±1.39	0.49	93.04
18	163.7	11	154.55±1.13	0.39	94.41

were found to increase gradually.

Grade of malnutrition (Table 2) using height for age observed that all 24 girls (13-15 years) were short but in 16-18 year age group 58% girls were normal height and 42% were short, but none of the girls was dwarf or giant.
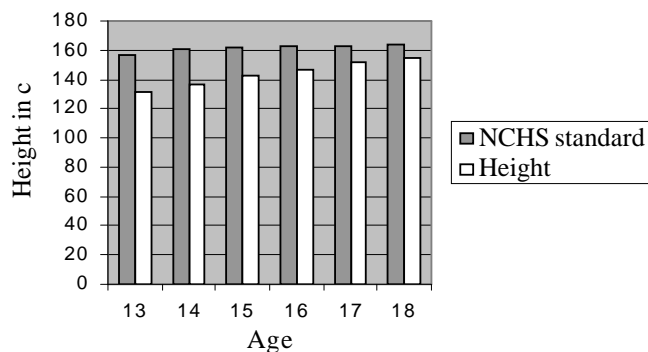

Fig. 1. Anthropometric measurement (height) of tribal dolescence girls (13-18 years)

The average weight (Table 3) of 13-18 years adolescent girls was also in increasing order *i.e.* 31.67, 34.25, 38.20, 42.29, 43.50 and 47.09 kg. but when compared with NCHS standard, it was much lower than the NCHS standard and ranges between 68-83% of NCHS standard.

The Fig .1 and 2 show the relationship between age and weight.

Table 4 depicts that IQ level of 13-18 years adolescent girls was in increasing order *i.e.*92.50, 101.00, 103.60, 109.57,
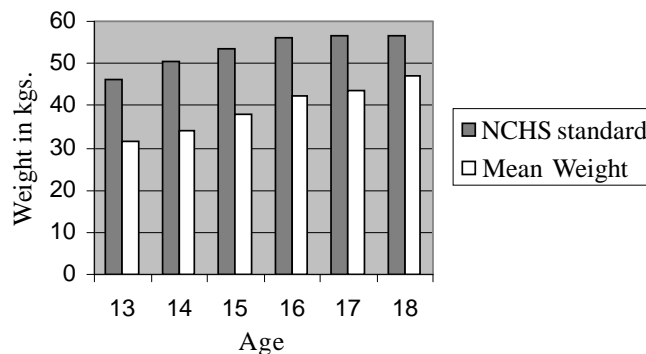

Fig. 2. Anthropometric measurement (weight) of tribal dolescence girls (13-18 years)

114.13 and 114.55 for 13,14,15,16,17 and 18 years, respectively. The IQ ranged 92-114.55.

According to IQ classification Table 5 revealed that 96% girls had normal IQ while 4% girls had below normal IQ.

From Table 6, the findings reveal that in between height and IQ level of girls and weight and IQ level of Vankal Mangrol Taluka of Surat District Kasturba hostel girls, there was high degree correlation in age 13,14 and 18 year girls whils moderate degree correlation was found in age of 15,16,17 years of girls of girls Vankal Mangrol taluka of Surat district.

Above all findings (Table 6) are in conformity with the study of Richard Lynn (1990), who reported that parallel increases in height increases in intelligence also. Daniels and Adair (2004) investigated that taller children had good grade in

Table 2. Per cent distribution of girls by grade of malnutrition using height for age

Height for age as % standard	Type of malnutrition	13-15 years (n=24)	16-18 years (n=26)
<80	Dwarf	NIL	NIL
80-93	Short	100(24)	42.31(11)
93-105	Normal	NIL	57.7(15)
<105	Giant	NIL	NIL

Table 3. Anthropometric measurement (weight) of tribal adolescence girls (13-18 years) of Vankal Mangrol taluka of Surat district

Age (years)	NCHS standard (cm)	N		SE	% of standard NCHS
13	46.1	6	31.67 ±1.51	0.61	68.69
14	50.3	8	34.25±1.28	0.45	68.09
15	53.7	10	38.20±1.99	0.63	71.14
16	55.9	7	42.20±1.70	0.64	75.65
17	56.7	8	43.50±1.41	0.50	76.72
18	56.6	11	47.09±1.81	0.55	83.20

Table 4. Mean, SD, SE value of IQ of 13-18 years tribal adolescent Vankal Mangrol taluka of Surat district

Age (Years)	13	14	15	16	17	18
Mean IQ	92.50	101.00	103.60	109.57	114.13	114.55
SD	4.37	11.86	10.13	1.99	3.44	3.56
N	6	8	10	7	8	11
SE	1.78	4.19	3.20	0.75	1.22	1.07

study and malnutrition adversely affect on school outcomes.

Table 5. Classification of IQ

	N	%
Excellent	NIL	NIL
Best	NIL	NIL
Good	NIL	NIL
Normal	487	96
	02	4
Border	NIL	NIL
Defective	NIL	NIL

Table 6. Correlation between height and IQ, weight and IQ 13-18 years tribal adolescent Kasturba girls hostel Vankal Mangrol taluka of Surat district.

Age (years)	Height vs. IQ	Weight vs. IQ
13	0.9076 (high degree)	0.8815 (high degree)
14	0.7888 (high degree)	0.8084 (high degree)
15	0.3813 (moderate degree)	0.6604 (moderate degree)
16	0.4041 (moderate degree)	0.2881 (moderate degree)
17	0.3961 (moderate degree)	0.7486 (moderate degree)
18	0.7651 (moderate degree)	0.8897 (high degree)

Ivanovic *et al.* (2002) investigated the relationship between nutrition status and IQ of Chilean high school graduates that prolonged under nutrition is associated with intellectual impairment.

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