

## **Assessment of Nutritional Status of Adolescent Girls using Anthropometric Method**

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### **ABSTRACT**

Adolescents are tomorrow's adult population, hence their health and well being is very crucial. So objective of this study was to assess the nutritional status of adolescent girls using anthropometric methods. This study was conducted in DAV College for girls, Yamuna Nagar and 50 adolescent college going girls were selected for the study. Nutritional status of adolescent girls was determined using different type of anthropometric methods. Height for age, weight for age, BMI, waist circumference, waist to height ratio of adolescent girls were taken and with the help of these measurements it was checked whether girls belong to normal or malnourished category. Results of the study showed that, for weight for age measurements 46% of girls weight was below the normal value, 26% of them weight was above the normal cut offs and 14% were falling in normal category. For height for age measurements, 58% of them had low stature or can say that their height for age was below normal values. For BMI categories, 46% of adolescent girls BMI fall in normal category followed by 28% of them whose BMI was in the range of 25.5-29.5 kg/m<sup>2</sup> *i.e.* overweight category whereas 16% of these girls fall in <18.5 kg/m<sup>2</sup> category *i.e.* underweight category. Waist circumference of girls were taken to determine the overweight or obesity condition and results showed that 68% of girls waist circumference was below 80cm which showed that these girls were not prone to the problem of obesity or overweight. Waist to height ratio induce is another anthropometric method which helps in determining body fat in abdomen region and study revealed that 58% of girl's height was less than half of their waist circumference which means that ratio came out to be normal or below normal, hence excess of abdominal fat was not accumulated in the body. So this study concludes by saying that anthropometric method is one of the best and crucial method for determining nutritional condition and proper nutritional intervention should be provided to under or over nourished girls for overcoming the nutritional problem.

**Key Words :** Anthropometric method, Nutritional status, Height for age, Weight for age, BMI, Waist circumference, Waist to height ratio

### **INTRODUCTION**

Adolescence is a vulnerable period in human life cycle when nutritional requirement increases due to growth spurts. This period is indicated by increase in height, weight, hormonal changes resulting in sexual maturation (Gupta, 1990). Most of the adolescent girls began growth spurt between 13-19 yrs. Adolescence is the most stressed period of life. Adolescent health is an important aspect of healthcare, recognized worldwide. But in India, like many other countries, this is an issue

which is insufficiently acknowledged and so far, has not received the adequate attention (Minhas and Sekhon, 2014). This a period which demands for more energy, protein, minerals and vitamins (Gopalan *et al.*, 2001). If these nutritional needs are not met then it leads to critical undernourishment. In India, poor nutrition, early bearing and reproductive health complications compound the difficulties of physical development in adolescent girls (Manford and Picciano, 2000). Increased physical activity combined with poor eating habits and the onset of menstruation contributes to accentuating the potential risk

**How to cite this Article:** Grewal, Ruhi (2019). Assessment of Nutritional Status of Adolescent Girls using Anthropometric Method. *Internat. J. Appl. Soc. Sci.*, 6 (1) : 143-146.

for adolescent’s poor nutrition (Bhaskaran, 2001).

Overweight or obesity is defined as accumulation of abnormal or excessive fat that may impair health (Kumah *et al.*, 2015). It may be simply just a state of excess of adipose tissue (Flier and Maratos-Flier, 2008). Evidence based on surveys indicates that there is a rising incidence of overweight and obesity among all age groups (Flier *et al.*, 2004). It has been found in many studies that the prevalence of combined overweight and obesity is more in adolescent girls (16.66%) than in boys (12.48%) (Kafatos *et al.*, 2005). A “double burden” of disease exists now (Sekhon and Minhas, 2014). No. of adolescent girls are over nourished due to improper, inadequate and consumption of excess of nutritional intake than required. This might be due to lack of physical activity, sedentary and luxurious life style, consuming excess of calories in the form of refined carbs, saturated and trans fats which leads to nothing but accumulation of excess of fats in adipose tissue of body thus making girls overweight or obese and making them prone to life style disorders.

Thus anthropometric measurements can be used to detect nutritional status of adolescent girls, it can be used to monitor the changes in growth of adolescents. Anthropometric measurement is an important determinant of nation’s health (Parimalavalli and Sangeetha, 2011). Anthropometry is one way of making this observation (Minhas *et al.*, 2013). Measurements of height, weight, waist circumference, BMI, height to waist ratio, etc. are an important indicator and reliable means in assessing the nutritional status of adolescent girls to detect whether adolescent is over or under nourished.

**METHODOLOGY**

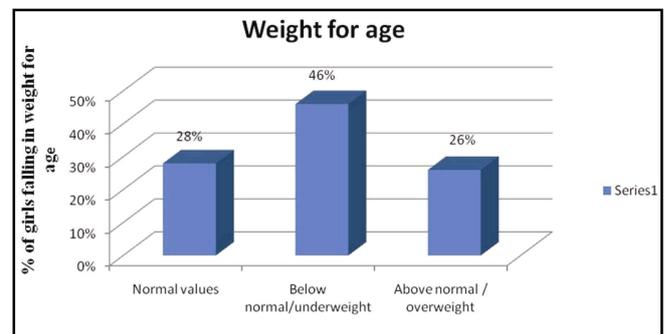
This study was conducted to determine the nutritional status of adolescent girls whether these girls are normal, under or over nourished and proper nutritional intervention provided to those girls. For this study, 50 adolescent college going girls were selected on random basis from DAV College for girls, Yamuna Nagar and study was conducted on them. For taking anthropometric measurements, anthropometric equipments were used for taking proper values. Measurements were taken and their value was compared with WHO reference values and NIN reference cutoffs. Questionnaire method was used for collection of data. Questionnaire consists of unambiguous, objective and easy to answer anthropometric questions. A category of height, weight,

BMI, waist circumference, waist to height ratio was listed in questionnaire under the heading anthropometric measurements. Measurements to be taken was listed on left side of column and standard value of these measurements was list on right side and with the help of these standard values, measurements could be detected and nutritional condition could be assessed.

**RESULTS AND DISCUSSION**

Nutritional status of girls was assessed using anthropometric methods and results were taken and it was found that:

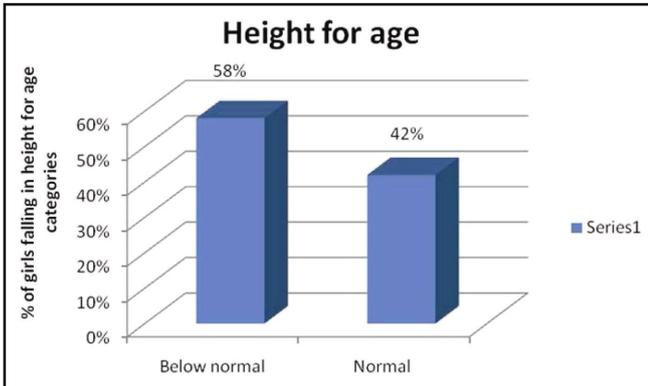
Anthropometric measurements were taken for weight for age of college going adolescent girls (18-20 yrs) with the help of beam balance equipment, their weight for age was compared with the help of WHO reference values and nutritional status was determined .On the basis of reference values, Fig. 1 reveals that 46% of girls weight for age was below normal *i.e.* they fall in the category of underweight on the basis of weight for age, followed by 26% of girls whose weight for age was above the normal values *i.e.* they belong to overweight category.



**Fig. 1 : Girls distribution on the basis of weight for age categories**

Height for age measurements were taken of adolescent girls (18-20 yrs) using fibre glass tape and measurements were compared with the help of WHO reference values and nutritional status was determined and result showed that 58% of girls height for age was below normal *i.e.* they had low stature or stunted (Fig. 2).

Table 1 shows about the nutritional status of adolescent girls on the basis of BMI and result reveals that 46% of girls fall in normal category of BMI *i.e.* between 18.5-23.5 kg/m<sup>2</sup> followed by 28% of girls whose BMI is between 24.5-29.5 kg/m<sup>2</sup> whereas 16% of girls



**Fig. 2 : Girls distribution on the basis of height for age categories**

and are more prone to the problem of overweight or obesity and life style disorders.

Waist to height ratio	No. of girls falling in this category	% of girls belonging to this category
Height less than half of the waist circumference	29	58%
Height greater than half of waist circumference	21	42%

who are undernourished falling in <math> < 18.5 \text{ kg/m}^2 </math> category and only 8% of girls fall in Grade I obese category *i.e.* 30.5-34.5kg/m<sup>2</sup>.

BMI Categories	Nutritional status	% of girls falling in this category
<math> < 18.5 \text{ kg/m}^2 </math>	Underweight/ undernourished	16%
18.5-23.5kg/m <sup>2</sup>	Normal	46%
24.5-29.5kg/m <sup>2</sup>	Overweight	28%
30.5-34.5kg/m <sup>2</sup>	Grade I obese	8%
35.5-39.5kg/m <sup>2</sup>	Grade II obese	-
>40.5kg/m <sup>2</sup>	Grade III obese	-

**Summary and conclusions:**

The study was conducted to determine the nutritional status of adolescent girls by anthropometric method. Anthropometric method helps in detecting the nutritional condition of adolescent girls whether girls are under or over nourished. Present study was conducted in DAV College for girls, Yamuna Nagar and 50 adolescent college going girls were selected as sample size. Nutritional status of these was detected with the help of anthropometric method and measurements were compared with reference values Results showed that 46% of girls weight for age is below normal means they fall in category of underweight. Height measurements were taken with help of anthropometric rod and results showed that 58% of girls height for age was below not or we can say that they had low stature. BMI of adolescent girls was calculated and results showed that 46% of girls BMI falls is normal *i.e.* their BMI falls in category 18.5-23.5 kg/m<sup>2</sup> followed by 28% of girls whose BMI is between 24.5-29.5kg/m<sup>2</sup> *i.e.* they belong to overweight category whereas 16% of girls are underweight. Waist circumference measurement was taken and it showed that 68% of girls waist circumference is less than 80cm means excess fat is not deposited in waist region. Waist to height ratio was taken and results showed that 58% of girls height is less than half of waist circumference means excess of adipose fat is not deposited in waist region. So the study concludes by saying that anthropometric method are one of the reliable methods for detecting nutritional status and average girls nutritional status is nourished *i.e.* neither they are neither under or over nourished and those who are malnourished proper dietary supplement should be provided.

Table 2 shows that 68% of girls waist circumference is less than 80cm (80 cm), it means that they are not prone to the problem of overweight or obesity or we can say that excess of fat is not deposited in waist region and 32% of girls waist circumference is greater than 80cm means excess of fat is deposited in waist region and are more prone to the problem of overweight or obesity.

Waist circumference	No. of girls falling in this category	% of girls belonging to this category
<80cm	34	68%
>80cm	16	32%

Table 3 shows that 58% of girl’s height is less than half of waist circumference means it shows that excess of fat is not deposited in waist region whereas 42% of girls height is greater than half of waist circumference means excess of adipose tissue is deposited in waist region

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