RESEARCH PAPER

Correlation between nutritional status parameters and hemoglobin level of teenage girls and hemoglobin level

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Abstract : Malnutrition is caused by the absence of any essential nutritional factor in the diet, including defects in the formation of hemoglobin or low absorption of essential nutrients. Some malnutrition due to lack of iron in the diet or high quality protein, vitamin B6 deficiency which affects the heme protein in the synthesis of hemoglobin, vitamin E deficiency which affects the stability of the membranes of red blood cells it happens. Copper is not part of the hemoglobin molecule but it affects the absorption of iron in the liver. Iron deficiency is the most common nutritional disorder in the world. Worldwide, anemia is estimated to affect 2 billion people, or 30 per cent of the world's population and is more severe in developing countries due to frequent malaria and insect infestation. It particularly affects women in the reproductive age group and young children in tropical and sub-tropical regions. The World Bank estimates that malnutrition is a direct contributor to global diseases. Malnutrition occurs at all stages of life, but is most common in pregnant women, young children and teenage girls. Iron deficiency and malnutrition are a major public health problem among teenagers. Studies indicate that anemia in teenagers increases with age and the rate of growth is highest during teenage.

Key Words : Nutritional, Status, Parameters

INTRODUCTION

With regard to teenage, it has been a traditional belief that teenage is a critical stage of development.

Maturity includes mental, physical, social and emotional maturity. In other words teenage is an important stage of physical development in which their nutritional needs need special attention.

It is a well known fact that the prosperity of a nation depends upon the quality of its human resources. The World Health Organization considers boys and girls between the age group of 10-19 years as teenagers.

During teenage, women require a large amount of all the nutrients for the development. Teenage girls have higher dietary calcium and iron requirements for growth in height and associated skeletal development and blood volume and menstruation. Teenage girls mainly require micronutrients iron, calcium and iodine for growth and development. Thus, for normal growth and development

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in teenage girls, iron and calcium-rich food is required in large quantities. The low nutritional level of women during teenage and early adulthood has an impact on health. Poor nutrition during teenage leads to short stature, loss of muscular strength and working capacity. The risk of adverse reproductive outcomes increases if teenage girls remain of short stature into adulthood.

Teenage girls (10-19 years) are at higher risk of malnutrition. These include high increases in iron requirements due to low iron intake, high rates of infection and insect infestation, as well as social norms, early marriage and teenage pregnancy.

Rapid growth, body mass, blood volume and myoglobin in the muscles and hemoglobin in the blood tend to increase in teenage. The iron requirement in childhood is about 0.7 to 0.9 mg per day and in teenage boys need 1.37-1.98 mg per day and girls need 1.40-3.27 mg per day. Boys and girls need additional iron for the growth of red blood cells and body tissues.

After sexual maturity there is a rapid decrease in growth rate and the need for iron increases. As a result, malnutrition occurs during the developmental stage, especially in boys. Although growth is not rapid in girls, the need for iron increases as the menstrual cycle begins. Iron is lost during the menstrual cycle in girls at 12.5–15 mg per month and 0.4–05 mg per day. Therefore, lack of growth spurt in girls and malnutrition is a public problem.

Another cause of malnutrition in teenage is low dietary intake and reduced bioavailability of iron. Based on the data obtained, very little iron is obtained in the diet by girls and boys between 13-18 years in India. Based on the data obtained in India, it is found that more than 50 per cent of teenage girls consume 50 per cent less energy than RDA and more than 70 per cent of teenage girls consume iron less than 50 per cent of RDA.

Often teenage girls consume snacks made from refined grains as well as carbonated beverages and consume very small amounts of fruits and vegetables. Apart from this, tea or coffee after eating The habit of consuming K is also responsible for the prevalence of malnutrition. It was observed that the prevalence of malnutrition was 50 per cent in those who took tea or coffee after a meal, compared to those who did not take tea or coffee after the meal. Although the density of iron is the same in boys and girls, girls are at a higher risk of malnutrition due to iron loss during the menstrual cycle. Due to social discrimination between boys and girls, the diet of girls is quantitatively and qualitatively inferior.

Iron intake is even lower in the South East Asia region, due to a decrease in the bioavailability of iron. Their diet is based on cereals with little meat and vegetables, which helps in the absorption of iron. The presence of inhibitory factors that reduce the bioavailability of iron is high.

Data from India shows that the prevalence of malnutrition is higher among teenage girls on a vegetarian diet (43.8%) than among teenage girls whose diet includes animal foods.

MATERIAL AND METHODS

The current study was done in Gwalior city of Madhya Pradesh. A total of 200 adolescent girls sample size was used in this study. All the respondents were selected by random sampling method.

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Regional distribution of respondents regional distribution of respondents :

The above Table 1 shows the regional details of the respondents. For the study, a total of 200 teenage girls from two different areas of urban area and two villages from rural regions were selected in which 100 rural teenage girls and 100 urban teenage girls were included.

Table 1: Regional distribution of respondents		
Sr. No.	Area name	No. of respondents
1.	Urban area (Gwalior)	
(a)	Murar nadipar tal	100
	Total	100
2.	Rural area (Gwalior)	
(a)	Bada gao	100
	Total	100

Nutritional level

BMI :

BMI is used as a criterion to classify underweight, normal, overweight and obese. The WHO guide was used to classify BMI. A BMI less than 18.5 is

underweight, a BMI between 25-29.9 is overweight and a BMI greater than 30 is obese.

The above Table 2 shows the weight distribution of urban and rural teenage girls. Of the total 100 urban teenage girls, 33 per cent are underweight, 44 per cent normal, 40 (20%) overweight and 3 obese, while 46 of the total 100 rural teenage girls are underweight. 39 have normal weight, 12 are overweight and 3 per cent fat. From the above data it can be concluded that there is not much difference in BMI of urban and rural teenage girls.
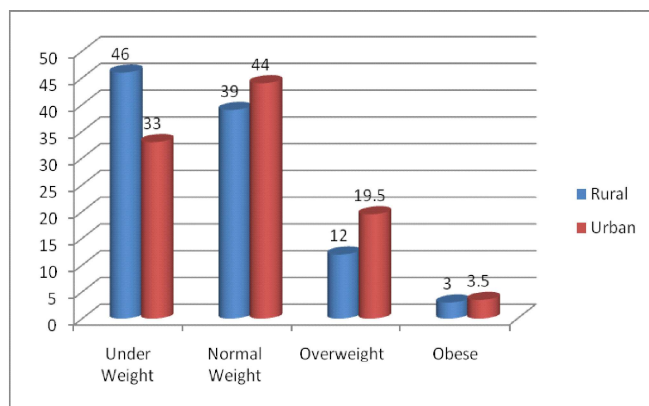

Fig. 1 : Diagram showing the percentage of BMI of rural and urban teenage girls

Interpretation :

The above diagram depicts the BMI of urban and rural teenage girls. In which, four categories based on BMI of teenage girls are shown: low weight, normal, overweight and the percentage of fat.

Correlation between nutritional status parameters (height, weight, protein, iron) of teenage girls and hemoglobin level :

Correlation between teenager height and hemoglobin levels :

The above Table 3 shows the height and hemoglobin level data of urban and rural teenage girls. To find out if there is a relationship between two parameters, the correlation co-efficient has been calculated.

Urban and rural case values were compared with values indicating a less positive relationship between the parameters.

This concludes that the height of teenage girls is not a strong indicator of hemoglobin level, whether the area is rural or urban.

Correlation between teenager weight and hemoglobin levels:

The above Table 4 is showing the weight and

Table 2 : BMI of urban and rural teenage girls					
Sr. No.	BMI	Rural teenagers		Urban teenagers	
		No.	Percentage	No.	Percentage
1.	Under weight (Less than 18.5)	46	46	33	33
2.	Normal weight (18.6 – 24.9)	39	39	44	44
3.	Overweight (25 – 29.9)	12	12	20	20
4.	Obese (More than 30)	3	3	3	3
	Total	100	100	100	100

Table 3 : Correlation between height and hemoglobin level of rural and urban teenage girls				
	Urban teenager girls		Rural teenager girls	
	Height (cm)	Hemoglobin (g/dl)	Height (cm)	Hemoglobin (g/dl)
Mean	151.79	9.35	147.17	8.22
Standard deviation	7.58	1.70	7.35	2.27
Co-relation	Y = 0.31		Y = 0.22	

Table 4 : Correlation between weight and hemoglobin level of urban and rural teenage girls				
	Urban teenager girls		Rural teenager girls	
	Weight (kg)	Hemoglobin (g/dl)	Weight (kg)	Hemoglobin (g/dl)
Mean	44	9.35	38.15	8.22
Standard deviation	8.43	1.70	7.55	2.27
Co-relation	Y = 0.67		Y = 0.44	

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Table 5 : Correlation between hemoglobin level and protein in urban and rural teenage girls

	Urban tenager grls		Rural tenager grls	
	Protein (g)	Hemoglobin (g/dl)	Protein (g)	Hemoglobin (g/dl)
Mean	46.43	9.35	46.40	8.22
Standard dviation	17.01	1.70	16.27	2.27
Co-relation	Y = 0.023		Y = 0.575	

Table 6 : Correlation between iron and hemoglobin levels in urban and rural teenage girls

	Urban teenager girls		Rural teenager girls	
	Iron (mg)	Hemoglobin (g/dl)	Iron (mg)	Hemoglobin (g/dl)
Mean	21.61	9.35	13.44	8.22
Standard deviation	5.74	1.70	4.63	2.27
Co-relation	Y = 0.122		Y = 0.252	

hemoglobin level of urban and rural teenage girls. Here the correlation co-efficient has been calculated to find out if there is a relationship between the two parameters. Urban affairs and the calculation of values in rural cases were compared with table values indicating high positive relationship between parameters in urban cases and moderate positive relationship in rural cases.

The data concludes that girls' weight is a strong indicator of hemoglobin level, whether the area is rural or urban.

Correlation between protein and hemoglobin levels :

The above Table 5 shows the data on the relationship between protein and hemoglobin levels of urban and rural teenage girls. To find out if there is a relationship between the two parameters, the correlation coefficient has been calculated.

Calculation of values in urban cases and rural cases is compared with table values indicating low positive relationship between parameters in urban cases and moderate positive relationship in rural cases.

This concludes that protein is a low indicator of hemoglobin level.

Correlation between iron and hemoglobin levels :

The above Table 6 is showing the iron and hemoglobin levels in urban and rural teenage girls. Here To find out if there is a relationship between the two parameters, the correlation coefficient has been calculated.

Calculations of values in urban cases and rural cases were compared with table values, which showed the following positive relationship in urban cases.

This concludes that iron is not a strong indicator of hemoglobin level in girls, whether the area is rural or urban.

Conclusion:

The current study highlights the Correlation between nutritional status parameters (height, weight, protein, iron) of teenage girls and hemoglobin level. The results conclude that iron is not a strong indicator of hemoglobin level in girls, whether the area is rural or urban.

Protein is a low indicator of hemoglobin level. The data concludes that girls' weight is a strong indicator of hemoglobin level, whether the area is rural or urban. This study concludes that the height of teenage girls is not a strong indicator of hemoglobin level, whether the area is rural or urban.

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