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RESEARCH ARTICLE

"EFFECT OF INTEGRATED STRATEGY ON IRON DEFICIENCY ANEMIA AMONG ADOLESCENT GIRLS".

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Abstract

Adolescent girls constitute one fifth of the female population if the world.The prevalence of anemia in adolescents in disproportionately high in developing countries. The prevalence of anemia estimated at 9 percent in high development countries and in countries with low development the prevalence is 43 percent especially, in population group of school age children and adolescents, the prevalence rate ranges from 29.2 percent to 79.6 percent. Anemia is an indicator of both poor health and poor nutrition.

Objective: Assess the effectiveness of integrated strategies on hemoglobin and serum iron levels on iron deficiency anemic adolescent girls

Methodology: The present school based interventional study was conducted among school going adolescent girls who were pursing 6^{th} to 10^{th} standard in selected Government Girls high schools in Kurnool city. The first intervention is the four sessions of nutrition education on iron deficiency anemic and weekly iron folic acid supplementation for 12 weeks. These two interventions were implemented on subjects simenteniously to assess the effect on improvement of serum hemoglobin levels. Pre and post strategy hemoglobin and serum and iron levels were estimated to assess the effectiveness of strategy. The collected data was analyzed by using mean, standard deviation and paid 't' test.

Results: The results depicts that before implementation of integrated strategy, 40 percent (50) were having mild anemia and 60 percent (75) were having moderate anemia. After 12 weeks of strategy implementation 47.2 percent (59) were improved to normal hemoglobin levels, 45.6 percent (57) were improved to mild anemia and only 7.2 percent (9) were having moderate anemia.

Conclusion: The high prevalence of mild and moderate anemia demands appropriate emphasis on covering high risk adolescents group to improve their iron status. It is quite important to strengthen health education on the consumption of iron rich foods and proper implementation of iron folic acid intervention proramme that would increase the hemoglobin levels among the adolescents age group through prophylaxis treatment and dietary modification.

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Introduction:-

World Health Organization has defined, adolescence" as period between 10 and 19 years[1.] In girls it has been recognized a special period of transition from girlhood to womanhood. Adolescent girls constitute one fifth of the female population in the world. The prevalence of anemia in adolescents is disproportionately high in developing countries[2]. Anemia is defined as the condition in which there is either less than the normal number of red blood cells (<4.2 millions/µl) or less than the normal quantity of (<12 g/ml) hemoglobin in the blood[3]. There are about 1.2 billion adolescents in the world, which is equal to 1/5th of the world's population and their numbers are increasing. Out of these, 5 million adolescents are living in developing countries. India's population has reached the 1 billion mark, out of which 21% are adolescents [3][4]. The prevalence of anemia estimated at 9 percent in high development countries, and in countries with low development the prevalence is 43 percent especially, in population group of school age children and adolescents, the prevalence rate ranges from 29.2 percent to 79.6 percent[5]. A review of Indian studies on anemia in adolescent girls revealed that > 70% of adolescent girls in low income communities had Hb levels < 110 g/L. When WHO cut off of 120 g/L was applied, the prevalence was even higher (80-90%) [6]. Anemia is an indicator of both poor health and poor nutrition[7]. Adolescence is a period of transition from childhood to adulthood. It is characterized by rapid physical, biological and hormonal changes resulting in psycho-social, behavioral and sexual maturity in an individual. It is the second growth spurt of life and both boys and girls undergo different experiences in this phase[8].

Material and Methods:-

The present school based interventional study was conducted among school going adolescent girls who were pursing 6th to 10th standard in selected Government Girls high schools in Kurnool city. In these schools totally 1407 adolescent girls were given their willingness to screen for anemia. After obtaining consent from their parents, permission from the District Educational Office and District Medical and Health Officer, all these adolescent girls were screened to detect anemia by using SAHLI's method of Hb estimation. Among the population 1127 adolescent school going girls were identified with anemia of various degrees (Mild, moderate and severe) severe anemic adolescent girls were exclude from the study. Only three girls were noticed with severe anemia and referred them to referral hospital. Among the anemic adolescent girls 861 were identified with iron deficiency by estimating serum iron levels. From this target population 125 adolescents girls were considered randomly as study sample. Pre interventional knowledge regarding iron deficiency anemia among subjects was assessed by administering semi structured questionnaire prepared by investigator. Based on their education and understanding level a planned teaching module on iron deficiency anemia was prepared by the investigator. This module was used to administer in four sessions of nutrition education on iron deficiency anemia which was planned with gap of 2 to 3 weeks for each session. Sessions were taken with combination of various methods of teaching i.e., lecture method, lecture with discussion method, lecture with various types of AV Aids (charts & posters) and lecture with exhibition Along with nutrition education, the 2nd intervention i.e. weekly iron folic acid supplementation (100 mg elemental iron in the form of Ferric Salfate and folic acid 500 mcg) was given for 12 weeks. Pre & Post strategy hemoglobin (Hb) and serum iron levels were estimated. The time duration spent by the investigator to implement two interventions simultaneously was three months.

Table No. 1:- Frequency and percentage distribution of severity of anemia before and after implementation of integrated strategy (N=125)

Severity of Anemia	Before implementation		After implementation	
	Number	Percentage	Number	Percentage
Non Anemic	0	0	59	47.2
Mild Anemia	50	40	57	45.6
Moderate Anemia	75	60	9	7.2

The above table shows that frequency and percentage distribution of change in severity of anemia based on hemoglobin levels before and after implementation of strategy to anemic adolescent girls. The results depicts that before implementation of strategy, 40 percent (50) were having mild anemia and 60 percent (75) were having moderate anemia. After 12 weeks of implementation of strategy, 47.2 percent (59) were improved to normal hemoglobin level, 45.6 percent (57) were having mild anemia and 7.2 percent (9) were having moderate anemia.

Table No. 2:- Effect of integrated strategy on mean Hb level among adolescent girls (N= 125)

Effect of Strategy	Mean	SD	T Value	P Value
Before	9.38	1.13		
After	12.14	1.09	38.93	0.0001

The above table describes, the effect of strategy on Hb level among anemic adolescent girls. The mean and SD computed for Hb levels before implementation of strategy, is 9.38 (SD 1.13), and increased of 12.14 (SD 1.09) after implementation of strategy. The t-test value is 38.93, by comparing the mean scores was found significant at 0.0001 level, i.e. $p<0.0001$.

Table No.3:- Frequency and percentage of anemia before and after implementation of integrated strategy based on serum iron levels (N= 125)

IDA	Before Implementation		After Implementation	
	Number	Percentage	Number	Percentage
Normal (no anemia)	32	25.6	70	56
Below normal (IDA)	93	74.4	55	44

The above table shows the frequency and percentage of anemia before and after implementation strategy based on serum iron levels. 25.6 percent (32) were having normal serum iron level and 74.4 percent (93) were having below normal serum iron level. After implementation of strategy, 56 percent (70) were improved to normal serum iron levels and 44 percent (55) were identified below normal serum iron levels.

Table No. 4:- Effect of Integrated strategy on mean serum iron levels among adolescent girls (N=125)

Serum Iron	Mean	SD	T Value	P Value
Before	9.21	1.69	27.67	0.0001
After	11.25	1.98		

The above table describes that effect of mean serum iron levels before and after implementation of strategy among anemic adolescent girls. The mean and SD computed for serum iron levels before implementation of strategy is 9.21 (SD 1.69, and 11.25 (SD 1.98), after implementation of strategy. The t-test 27.67 for comparing the mean scores was found significant at 0.0001 level, i.e. $p<0.001$.

Conclusion:-

Adolescent girls were an important target group to anemia because their high iron requirements not sufficient to body, leads to depleted iron stores gives high prevalence of iron deficiency anemia.

Iron supplementation is corner stone in treatment of anemia. Nutritional education is a long term measure its occurrence. The integration of theses two interventions helps in prevention of iron deficiency anemia among adolescent girls.

Repeated nutrition education session with different AV aids, disseminated messages were fixed in their minds and they kept them into action along with IFS, such as selection of foods, maintenance of hygienic practices and motivating their parents towards adults education and poverty alleviation programmes. All these helps in improvement of Hb levels after implementation of strategy, than before.

The high prevalence of mild and moderate anemia demands appropriate emphasis on covering high risk adolescents group to improve their iron status. It is quite important to strengthen health education on the consumption of iron rich foods and proper implementation of intervention programme that would increase the hemoglobin levels among the adolescent age groups through prophylaxis treatment and dietary modification.

Policies and programmes for combating micronutrient malnutrition must be firmly rooted by dietary modifications, Non vegetarian diet is having more iron content, but it is very expensive to purchase by the poor socio-economic group of people. So, government should take necessary steps to supply non vegetarian diet at subsidiary rates.

Iron deficiency anemia is a multifactor disease that requires multi-pronged approach for its prevention. Hence, instead of single preventive approach of WIFS, it should be integrated with other preventive approaches given better iron stores and knowledge to correct IDA among adolescent girls.

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