

## Manipulating Aspects of Adolescent Anaemia

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**Abstract:** *Adolescence is one of the important stages of the lifecycle in terms of health interventions because of increased periodic physiological needs for iron. As a matter of pregnancy, growth spurts in adolescents, slightly exaggerated physiological functions, bleeding, both internal and external, and worm infestations, leads to certain quantity of iron lost from the body and also increase requirements for iron and prone to get anaemia during adolescence. Objective is to assess the factors influence anaemia among rural adolescent girls and to find out the association between myths and facts on anaemia and selected socio-demographic variables. A community based descriptive cross sectional study was done, using cluster sampling technique, 384 adolescent girls (10-19 years) from Vellore and Kancheepuram districts were selected based upon the inclusion criteria after obtaining an informed consent. Pre-structured, pre-tested questionnaire regarding factors influence anaemia was used which included information on socio-demographic, medical history, myths and facts on anaemia. It was concluded that major determinants of anaemia among adolescent girls were passage of worms in the stool, past history of malaria, poor intake of iron rich diet. Majority of the adolescents (16-19yrs) were having completely wrong myth on anaemia, and also there was significant association present between completely wrong myth on anaemia and selected socio-demographic factors.*

### Introduction

Adolescence has been defined by WHO as a period of life spanning the ages between 10-19. During adolescence, iron requirements are greater since there is rapid expansion of tissue. The terms anaemia, iron deficiency, and iron deficiency anaemia often are used interchangeably but equivalent. Iron deficiency anaemia is characterized by a defect in hemoglobin synthesis, resulting in red blood cells that are abnormally small (microcytic) and contain a decreased amount of hemoglobin (hypochromic). The capacity of the blood to deliver oxygen to body cells and tissues is thus reduced. Causes of anaemia may be physiological (menstruation, childbirth) or pathological (hookworms, malaria, haemorrhoid).

The end result of iron deficiency anaemia is nutritional anaemia which is not a disease entity. It is rather a syndrome caused by nutrition in its widest sense. Besides anaemia, there may be other functional disturbances such as impaired cell-mediated immunity, reduced resistance to infection, increased morbidity and mortality, diminished work performance. Iron deficiency may impair cellular responses and immune functions and increase susceptibility to infection.

The young women will become the parents of the next generation. They must be given every opportunity to develop to their full potential as healthy individuals. Hence, there is a need to assess various factors influencing anaemia among adolescents. In the current study

influencing factors of anaemia were divided into nutritional factors, physiological factors, psychological and socio-demographic factors.

### **Review of Literature**

Frank Mawutor Borbor et al., (2014) done a study of the determinants of anaemia among under-five children in Ghana. Objective of the study was to assess socio-demographic characteristics of household associated with anaemia among under-five children in Ghana. The logistic regression estimates identified a significant relationship between the prevalence of anaemia in children and a set of socio-demographic variables. In conclusion, it was found that child age, mother's age, place of resident and father's level of education were important determinants factors of anaemia in Ghana. It is recommended that Ghana Health Service should provide appropriate education on complementary feeding for mothers with under-five children in order to reduce prevalence of anaemia. Also, education on anaemia by MOH and GHS should target not only mothers, but fathers as well especially those with low level of education.

Naidu CH Simhachalam et al., (2014) were done a study on factors influencing anaemia among adolescent girls from Urban slums of Hyderabad-A cross sectional Cohort study to identify factors responsible for anaemia in adolescent girls and to promote safer motherhood by reducing anaemia in adolescent girls. Using a cross sectional cohort study, the survey was conducted in 2 urban slums in Hyderabad among 300 girls. The data entered on MS excel and the data was analyzed using SPSS version software. The prevalence of anaemia was 90% among illiterate girls, among premenarcheal girls 31.6%, postmenarcheal were 48.3%, among married girls 85.29%. It was concluded that improvement in literacy status is needed. All postmenarcheal girls should be supplemented with iron and folic acid tablets.

Fredanna A.D.M et al. (2012), facilitated an assessment of anaemia knowledge, attitude, behaviours among pregnant women in Sierra Leone to explore knowledge, attitude, behaviours of urban pregnant Sierra Leone women on anaemia. Hemoglobin levels were obtained from 171 pregnant women. Results showed 64% of the participants scored low on anaemia knowledge questionnaire, and a belief that anaemia caused by difficulty in pregnancy. Findings from the study indicated that education should focus on addressing myths that have potential detrimental effects. Multipronged interventions to address the multiple causes of anaemia, increase awareness about anaemia knowledge, since the participants' knowledge about causes, prevention, treatments need to be addressed.

### **Objectives of the study**

1. To assess the factors influence anaemia among rural adolescent girls in selected districts, Tamil Nadu
2. To find out the association between myths and facts on anaemia and selected socio-demographic variables.

### **Materials and Methods**

This is a community based descriptive cross sectional study. The study was carried out among 384 adolescent girls (10-19 years) residing in rural areas of Vellore and Kancheepuram districts by using cluster sampling technique since the study participants were distributed in a wide

geographical area. Sample size was calculated using the formula of estimating single proportion. Prior permission was obtained from the village presidents of study area and then obtained informed consent from the adolescent girls/parents/guardian. The beneficiaries who were eligible based upon the inclusion criteria only were included in the study. The girls were terminally ill, pregnant, fear of needle, having past history of malaria excluded from the study in order to avoid arising of bias, since that will influence the findings and results of the study.

## Methodology

Pre structured, pre tested questionnaire regarding factors influence anaemia was used which covered information on socio-demography, medical history, myths and facts on anaemia. The questionnaire was distributed after providing adequate explanation regarding terms which were new based on the health education principles. Questionnaire was distributed and data was collected. For the beneficiaries having poor educational status, assistance was given by the researcher and also by the other participants.

**Research Instrument:** Questionnaires on,

Socio-demographic data: Information on age, occupation, education, environmental history etc.

Food frequency questionnaire: Frequency of protein, milk and milk products, fruits, vegetable etc. and also data consumption of tea/coffee, junk food intake, skipping of meal.

Medical history: Presence of haemorrhoids, passage of worms in the stool, history of malaria, etc.

Myths and Facts on anaemia: Positive and negative sentences on various aspects of iron deficiency anaemia and were classified as completely wrong myth, good fact, best fact. Statistical analysis was done using SPSS (statistical package for social sciences).

## Results and Discussion

### 1. Findings Related to the Factors Influence Anaemia

Factors influencing anemia was determined by nutritional factors based on food frequency questionnaire, physiological factors based on medical history variables. Psychological factors based on questionnaire regarding myths and facts on anaemia.

**A. Nutritional factor:-** In the present study, there is an association between food intake frequency and anaemia.

Table 1 depicts prevalence of anaemia and it revealed that high prevalence was found among adolescent girls with a history of less consumption of dairy products, less intake of fresh vegetables, fruits and nuts, and cereals. The association was statistically significant at  $p < 0.001$ . Similar findings were observed by Gupta N., Kochar G. et al, (2008) that out of 110 girls, two third 81.8% were anaemic due to low dietary intake of iron and weight was found less and subjects were in energy deficit state.

**Table 1: Association between Anaemia and Frequency Of Food Intake**

Variable	Frequency of Intake and Prevalence of Anaemia					X2	P Value
	1 time/wk	2-5 times/wk	>5 times/wk	None	Seldom		
Dairy_ products	14%	8%	37%	21%	20%	88.86	P<0.001
Protein	14%	10%	35%	21%	20%	42.25	P<0.001
Fresh vegetables	14%	10%	36%	21%	21%	53.36	P<0.001
fruits and nuts	24%	7%	16%	37%	16%	45.12	P<0.001
Cereals	18%	9%	23%	34%	16%	22	P<0.001
Tea/coffee	8%	9%	61%	7%	15%	124.3	P<0.001
Skipping Of Meal	8%	35%	28%	9%	20%	82.34	P<0.001
Junk Food	22%	35%	27%	7%	9%	30.01	P<0.001

**B. Physiological factor:** Influence of physiological factor on anaemia was analyzed by using the questionnaire on medical history.

**Table 2: Association Between Anaemia and Medical History Variables**

Variable	Category	Anaemic		Chi Square	P value
		No.	%		
Presence of hemorrhoids	No	218	59.1%	0.276	0.59
	Yes	13	86.7%		
Current use of medication_antacid	No	213	59.3%	1.8	0.08
	Yes	18	72%		
Past history of iron Deficiency anaemia	No	195	58.2%	1.565	0.211
	Yes	36	73.5%		
Passage of Worms in the stool	No	8	2.1%	15.322 *	P<0.0001
	Yes	223	58.1%		
Illness in past four weeks	No	31	8.1%	17.935*	P<0.0001
	Yes	200	52%		
Intake of Antihelminthic drugs And iron supplement	No	118	30.7%	1.141	0.285
	Yes	35	9.1		
Past history of malaria	No	0	0	27.15*	p<0.005
	Yes	153	39.8%		

\* significant at p <0.05

In the study, there was a significant association present between anaemia and medical history variables that is prevalence of anaemia among adolescent girls with a history of passage of worms in the stool was 86.7%. It was also observed that highly significant association existed between history of malaria in the past and prevalence of anaemia was 100%. The findings were analogous to a study conducted by Rekha Dutt et al., (2009) that a significant association was found with a history of worm infestation and malaria. Susan E. Burger et al., also observed that individuals were affected with hookworm when they walk barefoot on soil that been contaminated with hookworm eggs where sanitation is poor. Hookworm attaches to the walls of the intestine by teeth or cutting plates causing blood losses from lesions and sucking and causes anaemia.

**C. Psychological factors:** Influence of psychological factors on anaemia was assessed by myths and facts on anaemia.

**Table 3: Distribution of Myths and Facts On Anaemia**

	Frequency	Percent	Valid Percent	Cumulative Percent
Completely wrong myth	267	69.5	69.5	94.8
Fair fact	97	25.3	25.3	25.3
Good fact	20	5.2	5.2	100.0
Total	384	100.0	100.0	

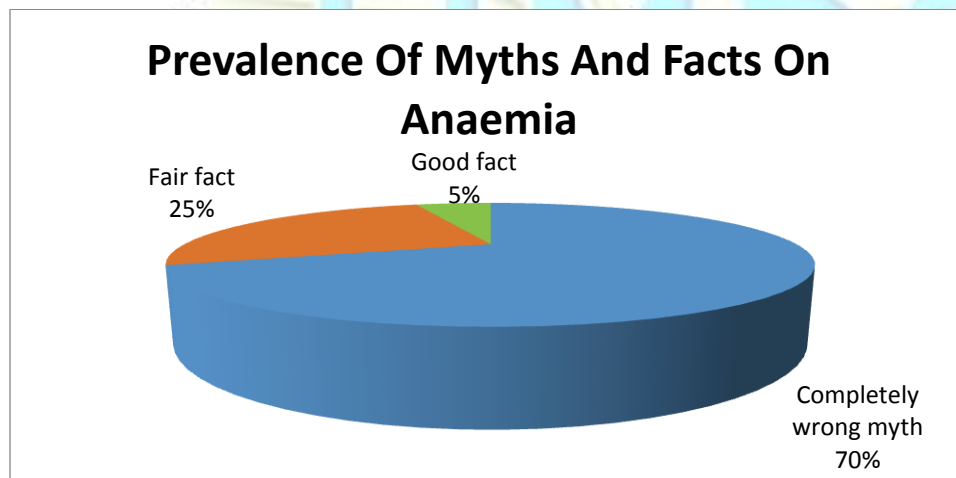
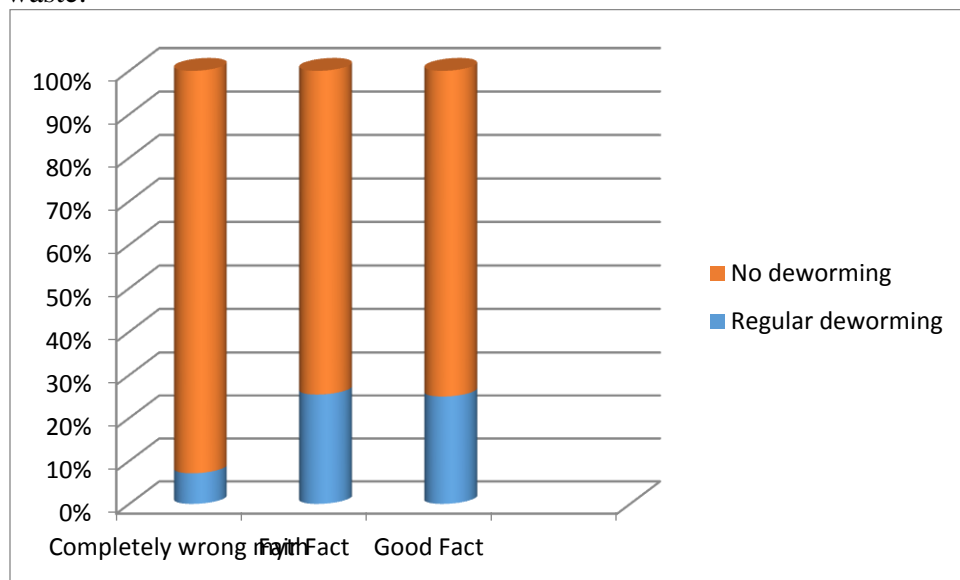


Figure 1

The present study reveals that most of the beneficiaries were having completely wrong myth 69.5%, fair fact 25.3%, and good fact 5.2%. Similar to the current study, Batool et al., (2010) and suggested that provision of female education, income generating opportunities, suitable age at marriage, provision of iron supplements etc.

## 2. Find out the association between myths and facts on anaemia and selected socio-demographic variables.

The current study findings showed that completely wrong myth on anaemia was observed among the adolescent girls aged between 16-19 years, girls having illiterate mothers, having practice of open field defaecation, girls with fear of weight gain, irregular timing of food intake, non vegetarian eating pattern, large family size, irregular deworming practice, improper disposal of waste.



**Figure: 2 Association Between Myths And Facts On Anaemia And Practice Of Deworming**

Parallel to the current study, Rita L. Ailinger et al., (2009) analyzed concepts of anaemia among low income Nicaraguan Women, and showed few of the women had biomedically accurate concepts of anaemia, others held folk medical beliefs including home remedies.

Consequent to the current study, Dorairajan Gowri et al., (2014) investigated on influence of awareness and attitude about anaemia and iron supplements on prediction of anaemia among pregnant women. Significant relationship between education and awareness regarding iron rich foods was noted. Wrong beliefs and myths about iron intake and lack of counselling about need for iron and problems due to anaemia were considered as significant modifiable factors.

## Conclusion

The current study revealed that iron deficiency anaemia is multi-factorial. It was concluded that major determinants of anaemia among adolescent girls were passage of worms in the stool, past history of malaria, poor intake of iron rich diet. It also proved that low iron bioavailability is a major aetiological factor. Promotion of accessibility, availability and affordability to diversify food to enhance absorbability of iron in the general population. Adolescent girls are one among the most vulnerable to anaemia, hence food fortification and food supplementation are important alternatives to fulfil the iron needs. It should be through equitable distribution and through community participation. It was also observed that there was significant association present between completely wrong myth on anaemia and selected socio-demographic factors such as age of girls, that is among 16-19 years, illiterate mothers, practice of open field defaecation, girls with fear of weight gain, irregular timing of food intake, non vegetarian eating pattern, large

family size, irregular deworming practice, improper disposal of waste. Behavioural change communication will be the tool to enhance the iron updates among the adolescent girls. The more severe the anaemia, the greater the reduction in work performance and thereby productivity, this has significance on the economy of the country. A comprehensive approach covering changing dietary habits, nutrition education, control of parasites by using appropriate technology to be developed to control and prevent anaemia.

### Limitations

1. Samples were recruited exclusively from the 6 villages of Vellore and Kancheepuram districts, 3 villages from each district.
2. Due to time constraint, 24 hour recall method could not be able to use to assess the consumption of iron rich foods, food frequency questionnaire was used, the responses may have had some recall bias due to poor memory.
3. Due to time constraint, feasibility and failure to cooperate by participants to give their stools for examination, stool examination was not done. So anemia caused due to hookworm infestations couldn't be specified, only oral information obtained and there may be a chance of information bias.

### Recommendations

1. The current study found that anemia is prevalent among the adolescent girls aged 16-19 years, hence the health education programmes and implementation of anemia control measures to be strengthened to the adolescents especially to this age group.
2. Completely wrong myth on anaemia was present among illiterate parents and girls aged 16-years, hence, the rural people shall be educated on health promotion measures such as practice of deworming, using of sanitary toilet etc, balanced diet, environmental sanitation and reinforcement to be given with full community participation.
3. Female literacy to be improved, hence prevalence of anaemia was high among illiterate mothers and facilitating action to extend education opportunities for girls.
4. Illiterate female with low socioeconomic status to be encouraged and nutrition education on kitchen gardening, education on consumption of locally available iron rich diet, frequent cooking demonstration by anganwadi workers or community health nurse, etc.

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