Prevalence of Anaemia among Adolescent Girls and the Outcome of Nutrition Education Programme

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Abstract

With a view to assess the prevalence of anaemia and impact of educational progamme on improving the status of anaemia, a two-phase study was carried out in Kannur district of Kerala (India). In phase 1, one thousand girls in age group 10-19 years were included. Second phase had 120 Anganwadi girls, 60 each in experimental and conrol group. The study showed positive outcomes after educational intervention.

India is one of the youngest countries of the world. More than half of the country's population is under 25 years of age and more than one-third is under 15 years of age. Adolescents constitute 25-30 percent of our population. Adolescent Indian girls are most vulnerable to health problems. With the highest adolescent population in India, the real challenge for the nation is to provide nutrition, health and education (UNICEF report, 2011).

Iron deficiency anaemia is the most prevalent form of anaemia in India. Lack of awareness among adolescent girls aggravates the situation as now-a-days they attach more importance to losing weight. The bliss of motherhood thrives under the looming presence of anaemia in India. It is recognised that moderate to severe anaemia is the leading cause of morbidity and mortality in children, while mild anaemia adversely effects the mental and motor development and the behaviour of children.

Anaemia cuts across all class and education barriers. It is depressing to note that 90 percent of girls in Delhi University who wish to donate blood cannot do so because their haemoglobin level is much below the cut off of 12.5 g/dL. During community health services the investigator found that the girls were not aware of their haemoglobin levels or the impact of anaemia on their development. With this background, the community-based study aimed to assess the prevalence of anaemia among adolescent girls in Kannur district of Kerala and to correct anaemia through a multipronged approach including nutrition education, dietary diversification and supplementation.

Objectives

The study was conducted with the objectives to:

a. Assess the prevalence of anaemia among adolescent girls in Kannur district.

b. Assess the knowledge of adolescent girls regarding anaemia.

c. Assess the dietary pattern of adolescent girls.

d. Prepare a nutrition education programme for adolescent girls with a view to bring a change in their knowledge regarding anaemia, dietary pattern and haemoglobin level.

e. Assess the outcome of nutrition education programme in terms of changein knowledge regarding anaemia, dietary pattern and haemoglobin level.

The conceptual framework of the study was the Pender's Health Promotion Model (HPM, 1996) which focuses on explaining health promotion behaviour.

Research Hypothesis

a. Prevalence of anaemia is high among adolescent girls in rural areas.

b. There is significant improvement in haemoglobin level, knowledge regarding anaemia and dietary pattern of adolescent girls after nutrition education.

Review of Literature

Haemoglobin status of school going adolescent girls in a district of Orissa was studied by Gilani K & Rahul KS (2007). This cross-sectional community study was conducted on 1925 adolescent girls aged 11-19 years. Sampling technique was cluster sampling. Haemoglobin estimation was done by cyan meth haemoglobin method. The mean haemoglobin concentration was found to be 9.7±1.4g/dL. Out of the total adolescent girls 1869 (96.5%) were anaemic (haemoglobin < 12g/dL) of which 45.2 percent, 46.9 percent and 4.4 percent had mild, moderate and severe anaemia respectively.

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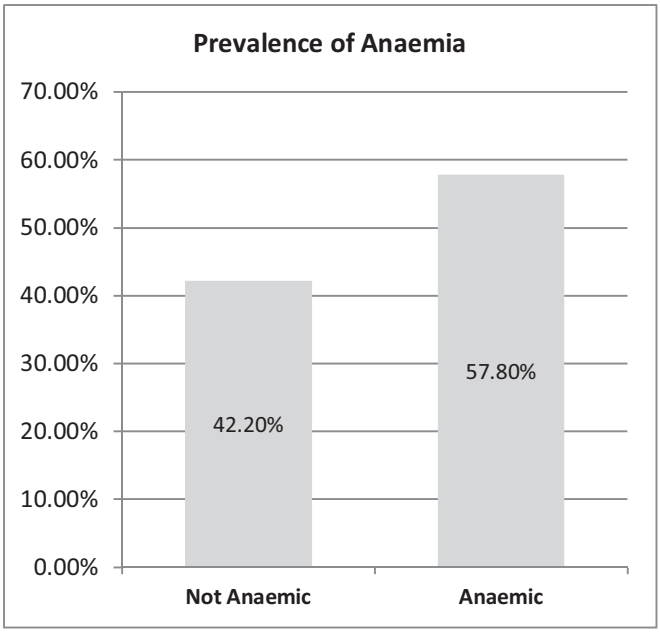

Fig 1: Prevalence of anaemia

Vipin Chandran KP (2005) assessed the health and nutrition profile of children in rural Kerala with special focus on Kasargod district to examine the trends and patterns of nutritional status of 120 samples of children aged 6-9 years in rural Kerala. Stratified random sampling technique was used; 42 percent of school going children in Kasargod suffered from severe or moderate anaemia and 32 percent were underweight. Age-wise classification of the weight for age of sample in this study area: 59.16 percent of children belonged to normal category; 21.66 percent, 13.33 percent, and 5.83 percent had mild, moderate and severe malnutrition respectively.

Methodology

A total of 1000 adolescent girls in the age group 10-19 years were studied. The study was approached in two phases. Under Phase 1, descriptive design was adopted. The prevalence of anaemia among adolescent girls was assessed using WHO haemoglobin colour scale. A structured questionnaire was used to assess knowledge and dietary pattern of the sample.

In Phase II, quasi experimental approach was used to test the effectiveness of nutrition education programme. Anganawadis where majority of girls had mild to moderate anaemia were assigned as experimental (n=60) and control (n=60) to test the effectiveness of nutrition education programme.

Inclusion criteria: Adolescent girls (1) attending the adolescent clubs functioning in the anganawadis in the three taluks of Kannur district; (2) with mild to moderate anaemia (haemoglobin 8-11g/dL) only; and (3) who are willing to participate in the study, were included.

Exclusion criteria: (1) Adolescent girls with marked anaemia (haemoglobin 6-7g/dL); (2) Pregnant adolescent girls will be excluded; and (3) Adolescent girls who are menstruating during data collection, were excluded.

Sample size: One thousand adolescent girls from urban and rural population in the three taluks of Kannur district who met the inclusion criteria were the sample for the study in the first phase. In the second phase, 120 samples, 60 in the experimental and 60 in the control group were the sample for the study.

Tools and techniques: In phase I, multistage sampling technique was used and in phase II, purposive sampling was adopted for the study.

The tools used were (a) Questionnaire (b) WHO Haemoglobin colour scale (c) Educational programme material- an audio-visual CD consisting of causes of anaemia, signs and symptoms control, preventive measures and dietary diversification.

Table 1: Distribution of samples based on degree of anaemia (n=1000)

Anaemia	Hb level	Frequency	Percentage
Not anaemic	> 12 g/dL	422	42.2
Mild to moderate anaemia	8-11g/dL	551	55.1
Marked anaemia	6-7g/dL	27	2.7
Severe anaemia	4-5g/dL	0	0
Critical anaemia	< 4g/dL	0	0

Table 2: Frequency and percentage distribution of samples based on knowledge (n=1000)

Knowledge	Frequency	Percentage
Poor	699	69.9
Average	252	25.2
Good	49	4.9
Total	1000	100

Results and Discussion

Prevalence of Anaemia among Samples is shown in Fig. 1. Table 1 shows that the prevalence of mild to moderate anaemia was in 551 (55.1%) and marked anaemia was in 27 (2.7%). Overall mean haemoglobin was 10.6 ± 1.4 g/dL.

Knowledge of Samples regarding Anaemia

Table 2 reveals that 699 (69.9%) samples had poor knowledge, 252 (25.2%) had average knowledge, and 49 (4.9%) had good knowledge regarding anaemia.

Dietary pattern of samples

Table 3 shows that fast food was consumed by majority 410 (41%) of samples 4-6 days a week. Cereals were consumed by 1000 (100%) of samples daily; 426 (42.6%) of samples consumed pulses daily; 549 (54.9%) ate roots and tubers 4-6 days a week. Table 4 & 5 depict

Table 3: Food Frequency table showing dietary pattern of samples (n=1000)

Food items	Daily		4-6 Days		1-3 Days		Never	
	F	%	F	%	F	%	F	%
Fast Food	15	1.5	410	41	122	12.2	453	45.3
Cereals	1000	100	0	0	0	0	0	0
Pulses	426	42.6	316	31.6	197	19.7	61	6.1
Roots & tubers	78	7.8	549	54.9	175	17.5	198	19.8
GLV	167	16.7	505	50.5	267	26.7	61	6.1
Other vegetables	183	18.3	500	50	258	25.8	59	5.9
Fruits	179	17.9	515	51.5	280	28	26	2.6
Milk & milk products	323	32.3	419	41.9	126	12.6	132	13.2
Fish	438	43.8	305	30.5	196	19.6	61	6.1
Meat	29	2.9	535	53.5	213	21.3	223	22.3
Egg	55	5.5	564	56.4	178	17.8	203	20.3

the domicile-based distribution of haemoglobin level and variance of haemoglobin. There was a high significance value for the Levine's test and hence equal variance is assumed among samples. The t value of 4.33 ($p<0.01$) reveals that prevalence of anaemia was high among adolescent girls in rural areas so research hypothesis stating that there is high prevalence of anaemia among adolescent girls in rural areas was accepted.

The mean values of Hb for the two groups are shown in the Group Statistics table.

Effect of nutrition education on haemoglobin level, knowledge and dietary pattern: Table 6 reveals that 51 (85%) had an increase in haemoglobin level than in the control group, 4 (6.7%) after education. Table 7 reveals significant improvement in knowledge, 60 (100%) in the experimental group. Table 8 shows that there is significant improvement in dietary pattern, 59 (98.3%) after nutrition education. In Table 9, post-test scores of experimental and control group have been compared.

The estimated t value is significant at 0.05 level for haemoglobin, knowledge and dietary pattern, which indicated effectiveness in the intervention. Thus the 2nd research hypothesis is accepted concluding that nutrition education had led to significant improvement in haemoglobin, knowledge and dietary pattern.

Implications

Haemoglobin Colour Scales can be effectively used by nurses for conducting surveys in detection of anaemia. Nutrition education programme developed can be used as a resource material for health personnel to educate adolescent girls in various settings. (c) Nurses at administrative positions can make necessary policies to implement the concept of adolescent health.

Recommendations

a. Adolescent girls should be educated thoroughly regarding anaemia in the schools and in the community for reducing the magnitude of the problem.

b. Haemoglobin level estimation should be made mandatory among school children under the school health programme.

c. School teachers and Anganwadi workers must be educated about the signs and symptoms of anaemia

Table 4: Distribution of haemoglobin based on place of domicile (n=1000)

Area Type	N	Mean Hb	Std. Deviation
Urban	453	11.2009	1.60525
Rural	547	10.7367	1.68276

Table 5: Variance of haemoglobin based on place of domicile

Variance assumption	Levine's Test		t	df	Sig
	F	Sig			
Equal variances assumed	3.13	0.077	4.33	998	0.00
Equal variance not assumed			4.453	978.3	0.00

Dependant variable – Hb; p<0.01

Table 6: Distribution of sample based on improvement in haemoglobin level after nutrition education

Group	N	Increase in Hb	
		Frequency	Percentage
Experimental group	60	51	85
Control group	60	4	6.7

Table 7: Distribution of sample based on improvement in knowledge after nutrition education

Group	N	Increase in knowledge	
		Frequency	Percentage
Experimental group	60	60	100
Control group	60	23	33.3

Table 8: Distribution of sample based on improvement in dietary pattern after nutrition education

Group	N	Improvement in dietary pattern after intervention	
		Frequency	Percentage
Experimental group	60	59	98.3
Control group	60	18	30

Table 9: Comparison of post-test scores in experimental and control groups

Variables	Post-test mean score		df	t	sig
	Experimental group	Control group			
Haemoglobin	11.27	10.03	59	16.831	0.01
Knowledge	20.13	5.18	59	7.704	0.02
Dietary pattern	28.13	22.92	59	8.778	0.03

$p<0.05$

and usage of haemoglobin colour scales.

Conclusion

Prevalence of anaemia was found to be 578 (57.8%) among samples, prevalence of mild to moderate anaemia was 551 (55.1%) and marked anaemia was 27 (2.7%). It was found to be high among samples in the age group 10-12 years 233 (62.29%) and those studying in upper primary classes 216 (63.52%) and premenarcheal girls, 275 (59.13%). Prevalence of anaemia was higher among samples residing in rural areas 340 (62.15%). Majority of girls had poor knowledge regarding anaemia, 699 (69.9%). Food intake of sample disclosed a deficit in intake of all foods except cereals. Nutrition education programme targeting knowledge and dietary practices was found to be accepted by the target group. The study revealed that nutrition education had resulted in improvement in haemoglobin level, knowledge and dietary pattern.

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