



EFFECT OF NUTRITION EDUCATION ON DIETARY PATTERN, HAEMOGLOBIN LEVEL AND KNOWLEDGE REGARDING ANAEMIA AMONG ADOLESCENT GIRLS

Dr. Swapna Jose* Dr.K. E. Elizabeth **

**Professor, College of Nursing, Thalassery, Kannur Kerala .*

***Former Professor of Paediatrics ,SAT Hospital ,Govt Medical College,Thiruvananthapuram.*

Abstract

Anaemia is a worldwide public health problem most commonly due to wide spread nutritional deficiencies. The purpose of the study was to assess the effect of nutrition education on dietary pattern, haemoglobin level and knowledge regarding anaemia among adolescent girls. In phase one descriptive design was adopted. 1000 adolescent girls attending the adolescent clubs functioning in the anganawadies of Kannur district were enrolled using multistage sampling technique. Haemoglobin was assessed using WHO haemoglobin colour scale. A structured questionnaire was used for assessing the knowledge and dietary pattern.

The data was analysed using SPSS -15th version. The prevalence of anaemia was found to be 578 (57.8%). The prevalence of mild to moderate anaemia was 551 (55.1%) anaemia and 2.7% had marked anaemia. Majority of girls (69.9%) had poor knowledge regarding anaemia. Dietary pattern of adolescent girls revealed that the consumption of iron rich foods were less than the recommended daily allowances.

In phase two quasi experimental approaches was used. Experimental and control group were selected by purposive sampling and nutrition education were given to girls in the experimental group and after three months the samples in the experimental group and control group were reassessed to evaluate the effectiveness of the nutrition education. The effect of nutrition education was analysed using paired t test. The estimated t value was significant at 0.01 levels for haemoglobin, knowledge and dietary pattern.

Key Words:- Anaemia, Adolescent Girls, Knowledge, Dietary Pattern, Nutrition Education.

Introduction

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

Education programmes seeks to provide and utilize all possible learning experiences contributing to the development of desired health habits, attitudes and knowledge. Ensuring that adolescents girls have haemoglobin above 12g/dl and are free from anaemia is an essential component of an effective nutrition education programme. During community health services the investigator identified that the girls were not aware of their haemoglobin levels or the impact of anaemia on their development. This motivated the investigator to take up this study.

Need and Significance

Adolescence has been defined by WHO as the period of life spanning the ages between 10-19 years. This is the formative period of life when maximum amount of physical, psychological and behavioural change take place. This is a vulnerable period in the human life cycle for the development of nutritional anaemia which has been neglected by public health programmes. Girls are more likely to be the victims due to various reasons. In a family with limited resources the female child is more likely to be neglected. she is deprived of good food and education and is utilized as an extra working hand to carry out the household chores. The added burden of menstrual blood loss normal or abnormal precipitates the crisis too often.

A cross sectional survey to assess the prevalence of anaemia among adolescent girls in an urban area of Nagpur conducted by Chaudary SM, Dhage VR (2008) shows that prevalence of anaemia was 45%. A significant association of anaemia was found with socio economic status and literary status of parents.

Nutritional anaemia is one of the major public health problems in India effecting 90% of children, adolescent girls and women with serious implications. Anaemia is causing red alert for Indian women. The Indian Medical Association feels



anaemia is rampant. Few field studies in Urban / rural poor have shown that over 90% of adolescent girls are anaemic spoiling their growth and making them shunted and effecting their school performance. Anaemia cuts all class and education barriers. It is depressing to note that 90% of girls in Delhi University who wish to donate blood cannot donate blood because their haemoglobin is much below the cut off of 12.5g%. Anaemia has a devastating effect on a person's health and yet many are not aware of its adverse impact. A poor diet is the primary cause for anaemia. Symptoms of anaemia may not show up in another wise healthy person until the haemoglobin drops below 10g/dl. A sample survey in four Delhi schools conducted in 2003 by the Delhi Gynaecologist Forum showed the incidence of anaemia in girls to be 75%. A screening of over 5060 school girls between 10-19 years in East Delhi in 2005 showed that incidence of anaemia in girls is around 50%.

Statement of problem

Assess the effect of nutrition education on dietary pattern, haemoglobin level and knowledge regarding anaemia among adolescent girls in Kannur district.

Objectives

1. Assess the knowledge regarding anaemia among adolescent girls
2. Assess the haemoglobin level of adolescent girls regarding anaemia
3. Assess the dietary pattern of adolescent girls .
4. 4) Assess the effect of nutrition education on dietary pattern, haemoglobin level and knowledge regarding anaemia.

Hypothesis

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

Methodology

Phase 1- Descriptive design was adopted. The haemoglobin level, knowledge and dietary pattern of adolescent girls were assessed. The information obtained from the first phase of the study regarding the Hb level, prevailing knowledge, and dietary pattern helped the investigator to prepare a nutrition education programme (CD ROM) covering the topics anaemia, types of anaemia, causes, signs and symptoms, diagnosis, prevention ,treatment and dietary modifications required in controlling anaemia.

Phase 11- Quasi experimental approach where pretest post test control group design was used. Based on the inferences from the first phase, experimental and control group were selected . Nutrition education was given to the girls in the experimental group .After three months the effect of education programme was assessed by reassessing the haemoglobin level, knowledge and dietary pattern in the experimental and control group.

Setting of the study:The study was conducted in the three Taluks of Kannur district.

Sample and Sample size

Sample consists of adolescent girls in the age group of 10-19 years of Kannur district and meeting the inclusion criteria. Sample size was 1000 in the first phase and 120 samples (experimental group -60 and control group -60) in the second phase.

Inclusion Criteria

1. Adolescent girls attending the adolescent clubs of selected anganawadis in the three Taluks of Kannur district.
2. Adolescent girls with mild to moderate anaemia only were included in the second phase of the study.

Exclusion Criteria

1. Pregnant girls were excluded.
2. Adolescent girls who were menstruating during data collection were excluded.

Sampling Technique

In phase one multi stage sampling and in phase two purposive sampling were used.

Tools

The tools used for data collection were 1) WHO Haemoglobin colour scale. The scale classifies haemoglobin level as 12g/dl or more (not anaemic),8-11g/dl (mild to moderate anaemia) ,6-7g/dl (marked anaemia), 4-5g/dl (severe anaemia), <4g/dl - critical. The haemoglobin level was estimated using haemoglobin colour scale.



Haemoglobin Colour Scale is a simple, reliable and inexpensive tool developed by World Health Organisation to screen for anaemia. The Haemoglobin Colour Scale comprises a small card with six shades of red that represent haemoglobin levels at 4,6,8,10,12 and 14g/dl respectively. The device is simple to use. Use of this device requires no electricity and the results are immediate.

Haemoglobin colour scale comprises a small card with six shades of red that presents haemoglobin levels

- Place a drop of blood on the test strip provided.
- Wait about 30 seconds
- Match immediately the colour of blood spot against one of the hues on the scale. This will indicate whether the patient is anaemic and if so the severity of anaemia in clinical terms.

2) Structured Questionnaire to assess knowledge and dietary pattern of adolescent girls. Twenty five items that could elicit knowledge of the samples were prepared in the topics related to anaemia. Total score was 25. Good knowledge- 17-25 score, Average knowledge- 8-16, Poor knowledge- 0-7.

Dietary pattern was assessed by weekly food use frequency which was measured on a three point scale. Based on the frequency of use of various food items the food use frequency scores were calculated as

$$\text{Percentage of total score} = \frac{R1S1 + R2S2 + \dots + RnSn}{N}$$

Where Sn= scale of rating given for frequency of use of food n =percentage of beneficiaries under each frequency group ,N= Maximum scale of rating.

Nutrition Education Programme

American Dietetic Association (2007) has defined nutrition intervention as purposefully planned actions designed with the intent of changing a nutrition related behaviour, risk factor, environmental condition or aspect of health condition of an individual, family, target groups or the community at large.

The information obtained through survey from the first phase of the study regarding the prevalence of anaemia, prevailing knowledge, and dietary pattern helped the investigator to prepare an audio-visual CD covering the topics including anaemia, types of anaemia, causes, signs and symptoms, diagnosis, prevention, treatment and dietary modifications required in controlling anaemia. The education programme was designed with a view to increase the haemoglobin level of adolescent girls by improving the knowledge and adoption of better dietary practices among adolescent girls. The education programme was given to the experimental group comprising of 60 sample. After showing the CD a discussion session was carried out and the doubts were cleared. The contact details of the sample were collected and regular follow up was made by the investigator with the help of anganawadi teachers regarding their progress in following the instructions. The parents of the girls were contacted, made aware of their daughter's haemoglobin level and suggested measures to correct anaemia. Details of the education programme were organized under the following headings.

- Introduction
- Causes of anaemia
- Types
- Signs and symptoms of anaemia
- Diagnosis
- Preventive measures
- Dietary diversification
- Control measures

In Phase 11 of the study six anganawadis of Pallikkunnu Panchayath in Kannur Taluk, where sample had similar demographic characteristics and prevalence of mild to moderate anaemia were selected for the post test. The experimental group comprised of 60 sample from three anganawadis and 60 sample of the control group from the other three anganawadis of Pallikkunnu panchayat. Nutrition education was given to the girls in the experimental group. After three months the outcome of education programme was studied by checking the haemoglobin level, knowledge and dietary pattern in the experimental and control group.

a) Haemoglobin level

Haemoglobin level was assessed using WHO haemoglobin colour scale.



b) Change in knowledge

The same set of statements given earlier for collecting the prevailing knowledge was administered again after the education programme and the change in knowledge was computed.

c) Dietary Pattern

Dietary pattern were assessed based on the changes in the food use frequency scores.

Outcome of Nutrition Education

Outcome of nutrition education was assessed from the differences in the pre and post mean haemoglobin level, knowledge and dietary pattern scores using t test.

Analysis and interpretation

Table 1 -Frequency and percentage distribution of sample based on haemoglobin level

N=1000

Anaemia	Hb level	Frequency	Percentage
Not anaemic	>12g/dl	422	42.1%
Mild to moderate anaemia	8-11g/dl	551	55.10%
Marked Anaemia	6-7g/dl	27	2.7%
Severe Anaemia	4-5g/dl	0	0
Critical Anaemia	<4g/dl	0	0

Table 1 shows that 42.2% of samples were not anaemic, 55.1% had mild to moderate anaemia and 2.7% had marked anaemia.

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

Table 2 shows that 69.9% had poor knowledge, 25.2% had average knowledge, and 4.9% had good knowledge regarding anaemia.

Dietary pattern of sample

Table -3,Food Frequency table showing dietary pattern of sample

N=1000

Food Items	Daily		4-6 Days		2-3 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

Table -3 shows that fast food was consumed by majority (41%) of samples, 4-6 days a week, Cereals were consumed by 100% of samples daily. 42.6% of samples consumed pulses daily. 54.9% ate roots and tubers 4-6 days a week. Majority of samples (50.5%) ate green leafy vegetables 4-6 days a week. 50% of samples consumed other vegetables 4-6



days a week. 51.5% of samples consumed fruits 4-6 days a week. Majority of samples, 41.9%, consumed milk and milk products 4-6 days weekly . Majority of samples, 43.8%, ate fish daily. 53.5% ate meat 4-6 days a week. 20.3% never included egg in their diet.

Table -4 Average and total percentage of consumption of various food items
N= 1000

Food items	Average Score	Percentage of Total Score
Cereals	3	100
Pulses	2.11	70.4
Roots & Tubers	1.51	50.33
GLV	1.78	59.37
Other Vegetables	1.81	60.33
Fruits	1.85	61.67
Milk & milk products	1.94	64.73
Fish	2.13	70.83
Meat	1.38	45.87
Egg	1.47	49.13
Total	1.89	63.26

Table 4 shows that all the samples consumed cereals daily (100%) but the average consumption of other foods were less than the recommended daily allowances (RDA) .

Effect of Nutrition Education on haemoglobin level, dietary pattern and knowledge regarding anaemia among adolescent girls.

Table 5 Comparison of pretest and post test haemoglobin level in control group

Dependant variable : Hb

N=60

Mean Hb	N	Std. Deviation	t	df	Sig (2 tailed)
10.0167	60	0.98276	0.331	59	0.742
10.0333	60	0.9382			

P>0.05

Table 5 shows that there is no significant difference (p>0.05) between pretest and post test haemoglobin level.

Table 6, Comparison of pretest and post test haemoglobin level in the experimental group

Dependant variable : Hb

N=60

Experimental group	Mean Hb	N	Std. Deviation	t	df	Sig (2 tailed)
Pretest	10.1833	60	0.99986	13	59	0.02
Post test	11.2667	60	0.89095			

P<0.05

Table 6 shows that a high significance value (0.02) for the t test (P < 0.05) indicates that there is significant difference between pretest and post test haemoglobin level in the experimental group.



Table 7, Comparison of pre test and post test knowledge score in experimental group

Dependant variable - Hb

N=60

Experimental Group	Mean knowledge	N	Std. Deviation	t	df	Sig (2 tailed)
Pretest	4.18	60	6.377	19.05	59	0.024
Post test	20.13	60	2.213			

P<0.05

Table 7 shows a high significance value (0.024) for the t test (typically less than 0.05) indicates that there is a significant difference between the pretest and post test scores.

Table 8, Comparison of pretest and post test knowledge score in control group

Dependant variable - Knowledge

N=60

Control Group	Mean	N	Std. Deviation	t	df	Sig (2 tailed)
Pretest	5.12	60	6.926	1.158	59	0.252
Post test	5.18	60	6.823			

P>0.5

Table 8 shows that there is no significant difference in pre test and post test knowledge score in control Group.

Table 9, Comparison of dietary pattern scores in Experimental Group

N=60

Dietary pattern	Mean	N	Std. Deviation	t	df	Sig (2 tailed)
Pretest	22.55	60	3.397	12.715	59	0.021
Post test	28.13	60	2.801			

P<0.05

Table 9 shows that (t=12.715, P < 0.05) there is significant improvement in dietary pattern in the experimental group.

Table 10, Comparison of dietary pattern Scores in Control Group

N=60

Dietary Pattern	Mean	N	Std. Deviation	t	df	Sig (2 tailed)
Pretest	22.8	60	4.194	0.491	59	0.626
Post test	22.92	60	3.59			

P>0.05

Table 10 shows that (t=0.491, P>0.05) there is no significant improvement in dietary pattern in the control group.

Table -11` Comparison of post test scores of experimental and control group.

Variables	Post test mean score		df	t	sig
	Experimental Group (n=60)	Control Group (n=60)			
Haemoglobin	11.27	10.03	59	16.831	0.00
Knowledge	20.13	5.18	59	7.704	0.00
Dietary pattern	28.13	22.92	59	8.778	0.00
P<0.01					



Table 11 reveals that nutrition education had a significant effect on haemoglobin, knowledge and dietary pattern . The significance of difference in post test scores in the experimental and control group were analysed using paired t test. The estimated t value is significant at 0.01 level for haemoglobin , knowledge and dietary pattern which indicated effectiveness in the intervention. Thus research hypothesis accepted concluding that nutrition education had resulted in improvement in haemoglobin, knowledge and dietary pattern.

Implication

- a) Haemoglobin Colour Scales can be effectively used for conducting surveys in detection of anaemia.
- b) Quality of life of adolescent girls could be improved through screening and health education.
- c) Faculty in administrative positions can make necessary policies to implement the concept of adolescent health.

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