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Research Article

A Study to Evaluate the Effectiveness of Structured Teaching Module on Prevention of Anemia among Adolescent Girl at Selected School in Kotdwar

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Abstract

Aim: The aim of this study was to assess the prevalence of anemia and associated factors among school adolescent girls at selected school in Kotdwar. **Objectives**: The objectives of this study were as follows: (1) To evaluate the effectiveness of planned teaching program on iron deficiency anemia and its management. (2) To find out the association between pre-test level of adolescence girl with their demographic variables. **Materials and Methods:** Pre-experimental research design was adopted and non-probability convenient sampling technique was used to select the sample. The study was conducted in rural school of Kotdwar, where 300 samples who satisfied the inclusion criteria and gave voluntary consent for the study were selected. STP for assessing the "knowledge of adolescent girls regarding iron folic acid deficiency anemia" was used to collect data from the samples. **Results:** The finding of the study shows (61.3%) adolescent girls that had inadequate knowledge, 33.63% had moderate knowledge, and only 5% had adequate knowledge, during the pre-test. After giving structured teaching program (post-test), 90.63% adolescent girls scored adequate knowledge that only 9.3% come under moderate knowledge and 0.3% comes under inadequate knowledge. Association of demographic variables with the pre-test level of knowledge was done using Chi-square test. There was a statistical significant association found between level of knowledge and demographic variable such as age, education, and previous exposure at $P = 0.05$ levels. Hence, the research hypothesis "there will be an association between pre-test knowledge scores of care givers with their selected demographic variables" is accepted. **Conclusion:** The overall prevalence of anemia among adolescent females was found to be 90%. There is significant association of anemia with socioeconomic status and parents' educational status. There is need to increase awareness of anemia in adolescent girls and parents.

Key words: Adolescent, nutritional anemia, planned teaching program

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Introduction

Anemia is a condition, in which a person has an insufficient number of red blood cells or quantity of hemoglobin (Hb), which reduces the capacity of their blood to carry oxygen.

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Normal Hb for women is 12 gram per decilitre (g/dlL) and men 13 g/dlL. Anemia is widespread in India – 58.6% of children, 53.2% of non-pregnant women and 50.4% of pregnant women were found to be anemic in 2016, as per the NFHS. India carries the highest burden of the disease despite having an anemia control program for 50 years.

Adolescence more broadly refers to the phase of human development which encompasses the transition from childhood to adulthood. This period is very crucial since these are the formative years in the life of an individual, when major physical, psychological, and behavioral changes take place. The nutritional and the health needs of the adolescents are also more because of the growth spurt and the increase in physical activity in them. In females, adolescence marks the beginning of the menstrual cycle or reproduction. Adolescents gain 30% of their adult weight

and more than 20% of their adult height between 10 and 19 years, in which we call as growth spurt. Adolescent girls are at a high risk for anemia and malnutrition. Inadequate nutrition during adolescence can have serious consequences throughout the reproductive years of life and beyond. Very often, in India, girls get married and pregnant even before the growth period is over, thus doubling the risk for anemia. The nutritional anemia in adolescent girls attributes to the high maternal mortality rate, the high incidence of low birth weight babies, high perinatal mortality, and the consequent high fertility rates. This phase of life is also important due to the ever-increasing evidence that the control of anemia in pregnant women can be more easily achieved if a satisfactory iron status can be ensured during adolescence. About 43% of the adolescent deaths are related to pregnancy. Pregnancy during adolescence deprives the girls from achieving their full growth according to their genetic potential.[1]

Adolescence is the period of most rapid growth second to childhood. The physical and physiological changes that occur in adolescents place a great demand on their nutritional requirements and make them more vulnerable to anemia. Anemia in the adolescence causes reduced physical and mental capacity and diminished concentration in work and educational performance and also poses a major threat to future safe motherhood in girls.[2]

The period between 10 and 19 years of age has been defined as adolescence by the World Health Organization (WHO). This period has been considered as the transitional phase from childhood to adulthood. During this phase, major psychological, behavioral, and physical developments ensue, due to marked physical activity and rapid growth spurt adolescence needs additional nutritional requirements. According to recent statistics, there were about 1.2 billion adolescents worldwide, which constitute one-fifth of the total world's population and the figures are escalating. Developing countries account for about 5 million adolescents of the total adolescent population, and in India, about 21% of the total population are adolescents. At present, the prevalence of anemia among adolescent girls is on the rise in India. Since adolescent period signalizes the beginning of menstrual period in girls, they are at a higher risk for nutritional anemia. In rural areas of India, girls get married and become pregnant during the late adolescent period, thus increasing the risk of adolescent anemia and low birth weight babies.[3]

Common sources of iron loss are menses and hemorrhage. Total daily iron loss is <1 mg in menses ladies loose 1 mg of iron in addition. Hookworm infestation is the main cause of anemia in India. Iron deficiency anemia is the world's leading health problem. About 20% women suffer from it. Women who produce children at close intervals become anemic due to increased demand of the growing fetus and the loss of blood in each delivery anemia of the mother will affect the iron storage of fetus.

Total human body on an average contains 3.5 gm of iron and absorption of it is meticulously regulated by the intestinal mucosa according to the requirement of the body .daily requirement of iron is 20 mg and 1 mg is being absorbed lack of iron results in anemia and excessive consumption may result in deposition of iron in liver cells causing typical symptoms of cirrhosis. It is a wrong conception that meat eaters are having more of Hb or some better quality of blood.

During the adolescent growth spurt, the risk of iron deficiency anemia reappears for both boys and girls. Adolescent girls are a particularly vulnerable group as their requirements of iron as well as its losses from the body are high. Of the total population, adolescent girls form 22% and estimates suggests that about 25–50% girls become anemic by the time they reach menarche. Anemia during adolescence limits growth and delays the onset of menarche, which, in turn, may later lead to cephalopelvic disproportion. Iron deficiency is the most widespread form of malnutrition among women and children. India has the highest prevalence of iron deficiency anemia among women, including adolescents, worldwide. Between 60 and 70% of Indian adolescent girls are anemic (Hb < 12 g/dl).[4]

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 the WHO cut off of 120 g/L was applied, the prevalence was even higher (80–90%). Anemia is an indicator of both poor health and poor nutrition. Interventions for anemic adolescent girls should raise their iron stores and sustain their Hb at normal levels. This will not only improve their physical and mental capacity but also subsequently helps in reducing the incidence of low birth weight of infants and maternal mortality rates.[5] The world's adolescent population is facing a series of serious nutritional challenges which are not only affecting their growth and development but also their livelihood as adults. Yet, adolescents remain a largely neglected, difficult-to-measure, and hard-to-reach population, in which the needs of adolescent girls in particular, which are often ignored. The commonest causes of anemia in developing countries, particularly among the most vulnerable groups (pregnant women and preschool age children), are nutritional disorders and infections. Although various programs have been initiated by sovereign government, where the supplements are provided to meet the protein and calorie requirements of the vulnerable population[6]

Objectives

The objectives of this study were as follows:

1. To evaluate the effectiveness of planned teaching program on iron deficiency anemia and its management.
2. To find out the association between pretest level of adolescence girl with their demographic variables.

Research hypothesis

H_1: There will be a significant difference between pre-test and post-test level of knowledge of adolescent girls.

H_2: There will be a significant association between the pre-test levels of knowledge with selected demographic variables.

Materials and Methods

Research approach: Pre-experimental quantitative research approach was used because it was considered appropriate for the study because there is knowledge assessment after application of structured module.

Research design: The research design adopted for the present study was pre-experimental design.

Variables

Independent variables

- Age
- Monthly family income
- Education
- Previous exposure
- Type of family
- Dietary pattern
- Religion.

Dependent variables

Structured teaching program.

Research setting

This study was conducted in Government Girls School, Kalalghati of Kotdwar Uttrakhand, this School is Hindi medium and following State Government's rules and regulation. This is a rural area situated in Pauri district of Uttrakhnad, it has area of 15 sq.km.

Population

The population of the area was 570 out of which 300 adolescent girls were conveniently selected for the study.

Sample

Samples were 300.

Sampling technique

In this study, non-probability convenient sampling technique was used to select the samples.

Selection criteria

Inclusion criteria

The study includes the adolescent girls who were:
- Residing in selected government school.
- Willing to participate in study.
- Available at the time of data collection.
- Understanding Hindi/English.

Exclusion criteria

The study includes the adolescent girls who were:
- Not residing in selected schools.
- Not willing to participate in study.
- Not available at the time of data collection.
- Not understanding Hindi/English.

Description of the tool

The format of the structured teaching program comprise two section or parts:
Part I: Demographic variables – It consists of items describing sample characteristics such as age, education, family type, monthly income, previous exposure, and dietary pattern.

Part II: Questionnaire – It consists of items related to knowledge of care giver regarding nutritional needs of elderly person, the content include were meaning, changes, problems and requirements.

Each item had one correct response and each correct response is coded with one mark. The total number of possible correct response was 30 for the purpose of study the knowledge score was categorized as:
- Inadequate knowledge <50%
- Moderate knowledge 50–75%
- Adequate knowledge >75%

Results

Data were collected from 300 subjects using structured teaching plan. On the basis of the objective, the data were presented in the following sections:
- Section I – Frequency and percentage distribution.
- Section II – Pretest and posttest level of knowledge.
- Section III – Effectiveness of STP on adolescents' girls.
- Section IV – Association between demographic variables.

Table 1 show that about most of the samples 242 (80.67) were between 15 and 17 years of age, followed by 12–14 years (16.67%), and about (2.67%) were from 18–19 years of age. Regarding monthly family income, approximately half of the samples had monthly family income between <Rs. 5000 – (66.6%), followed by Rs. 6000–10000 – (28.670%). Nearly 3.34% of the families had monthly income of Rs. 10000–15000 – and only (1.34%) family had more than Rs. 1500 and above. Regarding education, (80%) of the adolescent girls were studying in 11–12 class and (19.34%) adolescent girls were studying in 9–10 class, followed by 7–8 class (0.67%). Related to previous exposure more than half adolescent girls (59.34%) are not previously exposed and 40.67% were previously exposed. Regarding religion, most of adolescent girls (97%) were belong to Hindu religion than (2%) were from Muslim and

Table 1: Frequency and percentage distribution *n*=300

Demographics variables	Frequency(f)	Percentage (%)
Age (year)		
12–14	50	16.67
15–17	242	80.67
18–19	8	2.67
Education		
7–8 class	2	0.67
9–10 class	58	19.34
11–12 class	240	80
Dietary pattern		
Vegetarian	180	60
Non-vegetarian	96	32
Lactose	0	0
Ovaltarian	24	8
Types of family		
Nuclear	172	57.34
Joint family	124	41.34
Extended	4	1.3
Monthly income (Rs.)		
<5000	200	66.67
6000–10.000	86	28.67
11.000–15.000	10	3.34
>15.000	4	1.34
Relision		
Hindu	291	97
Muslim	6	2
Christian	3	1
Persian	0	0
Other	0	0
Previous exposure		
Yes	122	40.67
No	178	59.34

only 1% belong to Christians religion. Related to type of family, (57.67%) of adolescent were from nuclear family, only (41.34%) of adolescent from the nuclear family and only (1.3%) were from extended family. Regarding dietary pattern, (60%) adolescent girls were vegetarian, (32%) adolescent girls were non-vegetarian, and only (1.3%) were ovaltarian.

Table 2 depicts that 61.3% adolescent girls had inadequate knowledge, 33.63% adolescent girls had moderate knowledge, and only 5% adolescent girls had adequate knowledge on nutritional needs of elderly during the pre-test. After giving structured teaching program (post-test), 90.63% adolescent girls scored adequate knowledge that only 9.3% comes under moderate knowledge and 0.3% comes under inadequate knowledge regarding iron folic acid deficiency anemia.

Table 3 shows that calculated Z value is greater than tabulated Z value so we accept research hypothesis. Therefore, the result is significant and there is significant difference between pre-test and post-test practice.

Table 4 shows that association of demographic variables with the pretest level of knowledge was done using Chi-square test. There was no significant association found between level of knowledge and demographic variables such as family monthly income, habitat, type of family, and dietary pattern. However, there was a statistical significant association found between level of knowledge and demographic variable such as age, education, and previous exposure at $P = 0.05$ levels. Hence, the research hypothesis "there will be an association between pre-test knowledge scores of care givers with their selected demographic variables" is accepted.

This indicates that the level of knowledge of adolescent girls varies according to their age, education, and previous exposure.

Discussion

In this chapter, the researcher has done the discussion under the following heading;

Objectives

To evaluate the effectiveness of planned teaching program on iron deficiency anemia and its management

The finding of the study shows (61.3%) adolescent girls which had inadequate knowledge, 33.63% adolescent girls had moderate knowledge and only 5% adolescent girls had adequate knowledge on nutritional needs of elderly during the pre-test. After giving structured teaching program (post-test), 90.63% adolescent girls scored adequate knowledge that only 9.3% comes under moderate knowledge and 0.3% comes under inadequate knowledge regarding iron folic acid deficiency anemia. The adolescent girls knowledge falls between 1 and 20 (<50%), they were categorized under inadequate knowledge, if they scored 21–30 (50–75%) they were considered as having moderate knowledge and if above >31, they were considered as having adequate knowledge (>75%). The percentage distribution of adolescent girls regarding iron folic acid deficiency anemia according to their level of knowledge. Majority of adolescent girls have inadequate knowledge and minority has adequate knowledge during pretest. However, in post-test, majority has adequate knowledge.

A study conducted to assess the effectiveness of structured teaching program on knowledge regarding prevention of anemia among adolescent girls in a selected senior secondary schools of Bharatpur. During the study, 60 adolescence girls were selected for them pre-test is administered for assessing knowledge. After evaluation,

Table 2: Frequency and percentage distribution according to level of knowledge *n*=300

Level of knowledge (%)	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
In adequate<50	184	61.3	01	0.3
Moderate 50–75	101	33.63	28	9.3
Adequate>75	15	5	272	90.63

Table 3: Effectiveness of structured teaching program

	Post-test	Pre-test
Mean	36.02	22.06
Known variance	33.16	22.87
Observations	300	300
Hypothesized mean difference	0	
Z	32.28	
Z critical two-tail	2	

Table 4: Association between the knowledge of the adolescent girls with their demographic variables

	DF	Chi-square	
Age	9.49	41.53	S
Education	9.49	22.86	S
Dietary habit	9.49	0.4	NS
Family	9.49	3.04	NS
Income	12.59	8.08	NS
Religion	9.49	4.78	NS
Pre-exposure	5.99	72.07	S

S: Significant, NS: No significant

pre-test score was showing lower knowledge regarding prevention of anemia then structured teaching program on knowledge of prevention from anemia administered after 1 week post-test conducted using same questionnaire that this time girls show increased knowledge regarding prevention of anemia and they are following healthy food habits for the prevention of anemia. Results showing adequate knowledge various methods are used for measuring the variables such as mean, mode, and standard deviation for significance of demographic variables Chi-square test, which were used that there are no significant demographic variables.[7]

To find out the association between pretest level of adolescence girl with their demographic variables

The study finding shows that association of demographic variables with the pre-test level of knowledge was done using Chi-square test. There was no significant association found between level of knowledge and demographic variables such as family monthly income, habitat, type of family, and dietary pattern. However, there was a statistical significant association found between level of knowledge and demographic variable such as age, education, and previous exposure at $P = 0.05$ levels. Hence, the research hypothesis "there will be an association between pretest knowledge scores of care givers with their selected demographic variables" is accepted.

This indicates that the level of knowledge of adolescent girls varies according to their age, education, and previous exposure.

This study was aimed to assess the knowledge regarding prevention of iron deficiency anemia among adolescent girls in selected pre-university colleges of Mangaluru.

A study was carried out to determine the knowledge regarding prevention of iron deficiency anemia among adolescent girls and to find the association between knowledge scores and selected demographic variables. The study result showed that majority (84%) of study sample had moderately adequate knowledge, 11% had inadequate knowledge, and 5% had adequate knowledge on prevention of iron deficiency anemia. There was no significant association found between knowledge scores and the selected demographic variables of the adolescent girls ($P > 0.05$).[8]

Conclusion

In a country like India, where the average life expectancy is increasing with raising nutritional problems in adolescent population, it is essential that the parents and teachers must be aware of the nutritional needs and requirements of the adolescent so that the nutritional problem of adolescent will be diminish.

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