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Short Communication

Effect of nutrition ball versus soaked raisin on increase of hemoglobin among adolescent girls

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Abstract

Adolescence has been defined by the WHO as the period of life spanning the ages between 10 to 19 years. This is a vulnerable period in the human life cycle for the development of nutritional anaemia. The prevalence of anaemia among adolescents is 27% in developing countries and 6% in developed countries. National Family Health Survey 2017 reports that 53% of all Indian women have anemia. The aim of the study is to evaluate the effectiveness of nutrition ball versus soaked black raisin on increase of hemoglobin level among adolescent students with iron deficiency anemia at selected college of Nursing. A quantitative comparative approach and a true experimental research design were adopted. 250 students were screened for symptoms of anemia using a checklist and 45 students were found to have iron deficiency anemia.5 students who had Hb < 7gmdl were referred for medical consultation remaining were assigned in to two groups by using simple random sampling technique. The demographic variables of selected samples were assessed by self-administered questionnaire. Level of hemoglobin was assessed by Sahli's Haemoglobin meter both in pretest and post-test. The study intervention nutritional ball to Experimental Group - I and soaked black raisins to Experimental Group - II were given for 30 days. The study findings revealed that the increase in mean hemoglobin of experimental group I 1.4 $\pm$ 1.21 was higher than that of experimental group II which was 0.34 $\pm$ 1.14. The calculated "t" value was 2.85 at $p<0.05$. The study concluded that the intervention intake of nutritional ball has significantly increased hemoglobin level than the soaked raisin among female adolescent students with iron deficiency anemia.

Keywords: Nutritional ball, Soaked black raisin, Hemoglobin, Adolescent students, IDA

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1. Introduction

Adolescence, as defined by the WHO, is the period of life from 10 to 19 years. This is a vulnerable phase in the human life cycle for the development of nutritional anaemia. The prevalence of anaemia among adolescents is 27% in developing countries and 6% in developed countries. The National Family Health Survey 2017 reports that 53% of all Indian women have anemia. Untreated anemia increases the risk of maternal and fetal mortality and morbidity, including abortions, premature births, postpartum hemorrhage, low birth weight, and impairment of maximal work capacity. In order to tackle this public health issue, a multi-pronged Weekly Iron and Folic Acid Supplementation initiative has been launched by the Ministry of Health and Family Welfare in India. The initiative targets all adolescents in the country with the aim of achieving a hemoglobin level of 12.5 gm/dl by the age of 12 years in 2013. Despite the prophylactic efforts of the supplementation programs, anemia among adolescent girls is still on the rise. Sushrutha Samhita that jaggery, or "gud," "purifies the blood, prevents rheumatic afflictions and disorders of bile, and has nutritive properties.[1]

The researcher is interested in evaluating a cost-effective, easily available intervention for iron deficiency anemia, focusing on nutritional supplements to increase hemoglobin levels. The aim is to establish empirical evidence on the effectiveness of nutritional balls and black soaked raisins in increasing hemoglobin, which in turn can help

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moderate anemia in adolescent girls. Sheeba.B et al conducted a prospective clinical study at a selected tertiary hospital during the months of August 2022 and January 2024.[2] The study involved 125 patients evaluated for type 2 diabetes mellitus and admitted to the inpatient department of general medicine. Relevant inferential statistics were used to analyze the data. Based on the study findings, out of the total 125 patients, 78 (36.5%) were females, while 47 (37.5%) were males. Among the observations that fall into the HbA1c >10 group, the majority (86.7%) had severe Hb. Significantly more than sixty-three percent of people who have had diabetes for more than ten years showed significant Hb severity.

According to Hippocrates, "Let food be thy medicine and medicine be thy food."

A sensible way to prevent teenagers from becoming iron deficient or anemic is to provide a diet naturally rich in iron. Proper nutrition, including adequate iron intake, plays an important role in teenagers' growth and development. Girls, in particular, need to consume more nutritious and iron-rich food because they lose some iron during their monthly cycles. Sheetal Chaya, et al (2010), evaluated the effectiveness of nutrition balls as supplements in improving hemoglobin levels.[3]

A combination of rice flakes and jaggery with alma powder was used. 60 subjects were selected by simple random sampling, including adolescent girls aged between 14 and 17 years. The subjects received oral nutrition balls of 150 grams twice a day for 21 days. The study findings reported an improved hemoglobin level in the experimental group ($t=13.356$, $P < 0.05$).

1.1. Statement of the problem

A study to compare the effectiveness of nutritional ball versus soaked black raisins on hemoglobin level among adolescent students with iron deficiency anemia at a selected School at Kanniyakumari District.[4]

2. Objectives

1. To evaluate the effectiveness of nutritional ball versus soaked black raisin on increasing hemoglobin level among adolescent students with iron deficiency anemia.
2. To compare the effectiveness of nutritional ball versus soaked black raisin on increasing hemoglobin level among adolescent students with iron deficiency anemia.

2.1. Hypothesis

There is a significant increase in mean hemoglobin level among adolescent students with iron deficiency anemia who consumed nutritional ball than those who consumed soaked black raisin.

3. Materials and Methods

A quantitative comparative approach and true experimental research design adopted for study at a selected School at Kanniyakumari District. 250 students were screened for symptoms of anemia using an anemia symptom checklist and 45 students were found to have iron deficiency anemia. 5 students who had Hb < 7gm/dl were referred for medical consultation remaining were assigned into two groups (EG I-20, EG-II-20) by using simple random technique. Demographic variables of selected samples were collected by self-administered questionnaire. Pre and post-test level of hemoglobin were assessed by Sahli's Haemoglobin meter. The EG I received a 50gm nutritional ball which was prepared with roasted and powdered rice flakes and ground nuts mixed with jaggery and dates for 30 days. While EG II consumed 10gms of black raisin soaked in 10 ml of water for 8 hours with water in empty stomach everyday for 30 days. The post-test levels of hemoglobin were measured and the data were analyzed by using descriptive and inferential statistics.[5]

4. Results

The analysis of demographic variables revealed that Majority, 40% were 21 years old, 54% of their parents had Secondary education, 20% were illiterate, 42% of the family had 3 children, 92% were non vegetarian, 54% of them had normal BMI, 66% had moderate menstrual flow, 44% were having duration of menstruation as 3-5 days, 38% of students known Hb level lies between 7-9gm/dl, 62% had mild symptoms of anemia.

Table 1: Frequency distribution of pretest and post-test level of anemia among adolescent Students with iron deficiency anemia in experimental group I and experimental group II.

Level of anemia	**Experimental group I (n=20)**				**Experimental group II (n=20)**			
	Pretest		**Post test**		**Pretest**		**Post test**	
	F	%	*f*	%	*f*	%	*f*	%
Mild anemia (10-11.9gms/dl)	0	0	7	35	4	20	8	40
Moderate anem (8-10gms/dl)	12	60	13	65	12	60	10	50
Severe anemia (7-8gms/dl)	8	40	0	0	4	20	2	10

(Note: Table shows Frequency distribution of pretest and posttest level of anemia among adolescent Students with anemia symptoms chekist and Lab values)

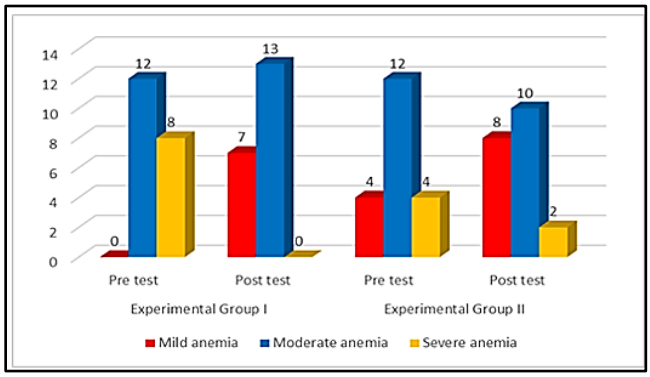

Figure 1: Pretest and posttest mean hemoglobin among adolescent students of experimental group I and experimental group II.
(Note: Diagram shows Pretest and posttest mean hemoglobin among adolescent students.

Table 2: Comparison of increase in mean hemoglobin between adolescent students and iron deficiency anemia of experimental group I and experimental group II.

Group	Mean Hemoglobin level	SD	Mean Difference	"t" Value
Experimental group I	1.4	1.21	1.06	2.85
Experimental group II	0.34	1.14		

(Note: This table demonstrates the Comparison of Increase in Mean hemoglobin between adolescent students and iron deficiency anemia of experimental group I and experimental group II. By Laboratory finding)

The findings revealed that the mean increase of hemoglobin 1.4gm/dl was higher in experimental group I than that of experimental group II 0.34gm/dl and the calculated t value 2.85 was significant at $p<0.05$. There was no significant association found between the level of hemoglobin and the selected demographic variables of the study participants in experimental groups.

5. Discussion

The study findings proved that the nutritional ball intake increased the hemoglobin level among female adolescent students with iron deficiency anemia. This findings of the present study was supported by the following study Chellamani (2014) Non probability purposive sampling technique was used to select the 60 samples out of which 30 samples for experimental group and 30 samples for control group. Pretest was done both experimental group and control group hemoglobin was assessed by using shale's hemoglobin method. Nutritional ball were given for experimental group for about 4 weeks. Posttest was done for both experimental and the control group the result showed that there is a significant difference between pre-test and post-test hemoglobin level among the experimental group. There is a Significant difference in the hemoglobin level after the nutritional ball intervention 't' value 18.48 p value <0.001 significant.[6]

6. Conclusion

The study findings proved that the nutritional ball intake increased the hemoglobin level among female adolescent students with iron deficiency anemia. The study finding revealed that increased hemoglobin level was significant at $p<0.05$ level through the intervention nutritional ball than the soaked raisin.

7. Source of Funding

None.

8. Conflict of Interest

None.

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