

Effect Of Finger Millet [Ragi] Ladoo Consumption On The Level Of Hemoglobin

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Abstract: Background- Among all nutritional deficiency disorders, iron deficiency anemia is more prevalent among adolescents especially in women population. **Objectives –** To evaluate the effect of consumption of finger millet [ragi] laddoo on the level of hemoglobin. **Material & Method-** This quasi-experimental study was conducted in ladies hostel of a selected college in Bhubaneswar, Odisha. The sample consisted of 120 nutritionally anemic young females of age group 17-19 years of age & staying at the hostel. The tool used was a self-structured interview schedule for demographic data and Sahli's Haemoglobinometer for estimation of hemoglobin level. The total number of study participants was 120. The samples were grouped into experimental groups and control groups with 60 samples in each group. The sampling technique used was the non-probability purposive sampling technique. Before the intervention, all the samples were dewormed. Among all study samples majority (95%) had moderate anemia whereas the remaining (5%) sample had mild anemia. The finger millet [ragi] laddoo two in number (50gm each) were provided daily for four consecutive weeks. The hemoglobin level was reassessed. The mean and standard deviation value in the pre-procedural level of hemoglobin was found to be 8.9 and 0.64 whereas in the post-procedural level of hemoglobin the mean and standard deviation was 9.04 and 0.65 respectively in the experimental group. The calculated 't' test value was 16 and 'p' value was 0.0001 ($p \leq 0.05$). **Results -** The study showed that the consumption of finger millet [ragi] laddoo has a significant effect on the level of hemoglobin among the study sample of the experimental group. **Keywords-** Anemia, Young females, Finger millet [ragi] laddoo

Introduction

Nutrition is essential for everyone. To become strong and stay healthy one should be physically active as well maintain healthy and to get this, proper and balanced diet is required. A balanced diet with appropriate nutritive value is needed to maintain the health at its optimum level. The nutrients are carbohydrate, protein, fat, vitamins, minerals, and water. Along with the nutrients, dietary habits also help in maintaining the health and the quality of life. ¹

Among all minerals required by the body one of the important mineral is iron. It is the key to blood production. The iron content of the body is about 70 percent which is found in the RBC of blood commonly known as hemoglobin. Anemia is the most commonly found nutrient deficiency

disorder. The condition is characterized when the RBCs are not able to carry a sufficient amount of oxygen to the body parts. WHO states that anemia is a condition in which the hemoglobin content of blood is less than the normal range. Though a varieties of anemia are there, the prevalence of nutritional anemia is higher than other types.

According to the National Family Health Survey (NFHS), in India 55% of the total women population is anemic. It includes 39% mild anemia [11-11.9g/dl], 15% moderate anemia [8-10.9g/dl] along with 2% with severe anemia [<7.9g/dl].² Jolly R et al (2000) surveyed to find out the prevalence of nutritional anemia and the associated factors with it in two different villages of Tamilnadu. The number of the study sample were 155 and 161 from two different blocks of Tamilnadu. The study participants had ages between 13-19 years. A blood sample was tested for the estimation of haemoglobin level. The study result showed that 44.8% sample had anemia among which 2.1% severe anemia, 6.3% moderate anemia & mild anemia 35.5%. The premenarchial girls had 40.7% of anemia prevalence & in postmenarchal girls the anemia prevalence was found to be 45.2%.

Ahankari A et al (2017), did a study to examine the prevalence & risk factors associated with iron deficiency anemia in rural Maharashtra. According to this study, the prevalence of mild, moderate, and severe anemia was found to be 17%, 65% & 5% respectively. Among 1010 adolescent girls, the mean hemoglobin value was found to be 10.1g/dl and 87% had anemia. Kathy et al (2013) examined the effect of finger millet [ragi] vermicelli supplementation on anemic women of age group 15-45 years. Pre-test post-test design was used with the experimental group on the intervention and control group without intervention. The intervention was given for five days in a week for consecutive 45 days. The results showed that there were significant increases in body weight by 3.31% and an increase in BMI by 2.65%.^{3,4}

A comparative study was conducted by Anandhi S (2014) to evaluate the effect of moringa leave extracts vs finger millet [ragi] porridge on the level of hemoglobin among the women of the reproductive age group. 60 samples were taken in which 30 samples received moringa leave extracts and the remaining 30 samples got finger millet [ragi] porridge in two villages named Orathy and Kadamalaiputhur villages at Kanchipuram district of Tamilnadu. The study showed a significant increase in the level of hemoglobin in both groups.⁵

Methods

Study design: The study is a quasi-experimental pretest-posttest design aimed at evaluating the effect of finger millet [ragi] laddoo consumption on the level of hemoglobin

Study setting: This study was conducted in the ladies hostel of a selected college at Bhubaneswar, Odisha.

Sample: The sample consisted of 120 nutritionally anemic (including only moderate & mild anemia) young females of age group 17-19 years of age & staying at hostel of the selected college without any other complications and iron supplementation. Non-probability purposive sampling technique was used. The total number of the study sample was 120. 60 of them were in the control group and the remaining 60 were in the experimental group

Data collection

Section A: Demographic data: self-structured interview schedule including age, height, weight, BMI, age of menarche, duration of menstruation, regularity of menstruation & Dietary Pattern

Section B: Blood sample test for estimation of the level of hemoglobin [by Sahli's Haemoglobinometer]

Demographic data collection was done. The selection of the sample was done by blood sample test for estimation of the level of hemoglobin.

Intervention & measure: All the selected samples were dewormed by anthelmintic drugs. Out of 120 samples, 60 samples of the experimental group, the finger millet [ragi] laddoo (100gm in the form

of two ladoos) were provided for 28 days and the remaining 60 samples of the control group, were not given any intervention. Post-test of blood samples was done to assess the level of hemoglobin.

Ethical consideration: The permission was obtained from the IEC Committee of Siksha “O” Anusandhan Deemed to be University, Bhubaneswar. Written consent from the participants was obtained.

Statistical analysis: Socio-demographic data and level of hemoglobin was analyzed by using frequency & percentage distribution. Paired & unpaired ‘t’ test was done to determine the effectiveness of finger millet laddoo consumption on the level of hemoglobin. Chi-square test was used for the association between the level of hemoglobin and selected demographic variables.

Table 1. Percentage (%) Distribution of the level of hemoglobin in the experimental group and control group. (N=60)

	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
Mild anemia {Hb-11-11.9g/dl}	4	6.6	2	3.4
Moderate anemia {Hb-8-10.9g/dl}	56	93.4	58	96.6
Severe anemia {Hb-<7.9g/dl}	Nil	0	Nil	0

Table 2. Mean, SD, ‘t’ value and ‘p’ value of pre-test and post-test hemoglobin level in the experimental group (N=60)

Pretest Mean ±SD	Post-test Mean ±SD	‘t’ test value	p-value
8.9±0.64	9.04±0.65	16	0.0001

p’ value ≤0.05

Table 3. Mean, SD, ‘t’ value and ‘p’ value of post-test hemoglobin level in the control group(N=60)

Pretest Mean ±SD	Post-test Mean ±SD	‘t’ test value	p-value
8.9±0.61	8.8±0.64	0.5	0.2

p’ value ≥0.05

Results

Table -1 depicted that, in the experimental group 6.6% of the sample had mild anemia and a majority 93.4% of the sample had moderate anemia whereas in the control group it was found that 3.4% of the sample had mild anemia and remaining 96.6% of the sample had moderate anemia.

Table -2 showed that the mean post-test score of hemoglobin level in the experimental group was and 9.04±0.65 and the mean pre-test score of hemoglobin in the same group was 8.9±0.64. It was found to be statistically significant as ‘t’ value as 16 at the degree of freedom 59 at 0.05 level of significance.

Table-3 revealed that, the pretest & post-test mean score of hemoglobin level in the control group was found to be 8.9±0.61 and 8.8±0.64 with ‘t’ value 0.5 and ‘p’ value 0.2 at the degree of freedom 59 at 0.05 level of significance.

The Chi-square value showed that the demographic variables such as age, BMI, age of menarche, duration of menstruation, regularity of menstruation, and dietary pattern were not found to be significant.

Discussion

The study revealed that a maximum 43.4% sample were having the age of 18-19 years which are coming under the young female group. The present study is supported by a baseline survey conducted by Jolly R et al (2000) which was carried out in two separate blocks of Vellore District, Tamil Nadu, by RUHSA Department of Christian Medical College and Hospital, by selecting 316 adolescent girls, within the age 13-19 years. The anemia was prevalent among 44.8% sample with severe anemia of 2.1%, moderate 6.3%, and mild anemia 35.5%. The study findings revealed that, there was an effect of finger millet [ragi] laddoo consumption on increasing the level of hemoglobin among the experimental group. It can be inferred from the study that though the study participants of the experimental group consumed the finger millet [ragi] laddoo for a limited period, still the level of hemoglobin was not increased to a satisfactory level in comparison to the hemoglobin level of the sample in the control group.⁶

This study is supported by another study conducted by Karkada Suja et al (2018), to find out the effect of finger millet [ragi] on improving hematological parameters, BMI & scholastic performance among 60 adolescents girls. The samples were divided into experimental and control groups with 30 samples in each group. The finger millet [ragi] porridge was given for 90 days after that reassessment was done. The study results from a significant increase in hemoglobin levels in the experimental group. However, the BMI and scholastic performance showed no significant difference.⁷

The present study revealed that, demographic variables such as age, BMI, height, weight, age of menarche, duration of menstruation, regularity of menstruation, dietary pattern were not associated with the deprivation of hemoglobin. On the contrary, socioeconomic status along with the literacy level of parents was significantly associated with anemia which was depicted by a cross-sectional survey conducted by Chaudhury Sanjeev M et al (2003) in Nagpur. The study included 296 adolescent females (10–19 years old). 35.1% of the total sample had anemia and it was higher in the aforesaid conditions. The present study was limited to a small sample size and short duration for data collection.⁸

Conclusion

Based upon the study findings it can be inferred that to minimize the complications due to anemia and to improve the general wellbeing, finger millet [ragi] to be consumed in a daily basis for all groups of the population as it contains a significant range of organic iron in compared to other cereals.

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Conflict of Interests: None

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