



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

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## EFFECTIVENESS OF RAGI LADDU ON HEMOGLOBIN LEVELS AMONG ADOLESCENT GIRL SCHOOL CHILDREN WITH ANEMIA IN SELECTED SCHOOLS, JAMSHEDPUR, JHARKHAND.

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**Abstract:** A quantitative one-group pre-test–post-test study was conducted to assess the effectiveness of Ragi laddu on haemoglobin levels among 60 adolescent girl school childrens with anaemia (Hb <12 g/dL) in a selected school , Jamshedpur, Jharkhand. Participants were selected using purposive sampling, and haemoglobin levels were assessed using a haemoglobin meter before and after receiving Ragi laddu for one month. The mean haemoglobin level increased from  $10.21 \pm 1.037$  g/dL in the pre-test to  $10.696 \pm 1.039$  g/dL in the post-test, with a statistically significant difference ( $t = 6.727$ ,  $p < 0.05$ ). Before the intervention, 65% had mild and 35% had moderate anaemia, whereas after the intervention, 6.7% achieved normal haemoglobin levels, 73.3% had mild anaemia, and moderate anaemia decreased to 20%. The findings indicate that Ragi laddu was effective in improving haemoglobin levels among adolescent girl school childrens with anaemia, suggesting its potential as a simple food-based nutritional intervention.

**Keywords:** Ragi laddu, haemoglobin, anaemia, adolescent girl school childrens, nutritional intervention.

## INTRODUCTION

### Introduction

Anaemia remains a significant nutritional health concern, particularly among adolescent girls and young women, with iron deficiency being one of its major causes. adolescent girl school childrens may be particularly vulnerable due to inadequate dietary intake, irregular eating patterns, academic stress, and increased nutritional requirements. Reduced haemoglobin levels can result in fatigue, weakness, impaired concentration, and decreased academic and clinical performance. Nutritional interventions using locally available and affordable foods offer a practical approach to addressing anaemia. Ragi (finger millet) is a nutrient-dense traditional cereal containing iron, calcium, dietary fibre, and other essential micronutrients. Incorporating ragi into an acceptable food preparation such as Ragi laddu may provide a simple and sustainable dietary strategy to support improvement in haemoglobin levels. Hence, the present study was undertaken to assess the effectiveness of Ragi laddu on haemoglobin levels among adolescent girl school childrens with anaemia in a selected school, Jamshedpur, Jharkhand.

### Need for the Study

Anaemia is a prevalent nutritional problem among young women and can adversely affect physical health, cognitive performance, concentration, and overall quality of life. adolescent girl school childrens are particularly susceptible due to demanding academic and clinical schedules, irregular dietary habits, and inadequate intake of iron-rich foods. Although iron supplementation is commonly recommended, food-based interventions using affordable and locally available ingredients may offer a practical and sustainable alternative. **Ragi (finger millet)** is a nutritious traditional cereal containing iron and other essential nutrients that may support haemoglobin synthesis. Preparing ragi in the form of a laddu provides a convenient and acceptable way of incorporating it into the daily diet. Therefore, evaluating the effectiveness of Ragi laddu in improving haemoglobin levels is important for identifying a simple, cost-effective, and culturally acceptable nutritional strategy for adolescent girl school childrens with anaemia.

### Methodology

A quantitative research approach with a pre-experimental one-group pre-test and post-test design was adopted for the study. The study was conducted among adolescent girl school childrens with anaemia in a selected school, Jamshedpur, Jharkhand. A total of 60 adolescent girl school childrens who fulfilled the inclusion criteria and had haemoglobin levels below 12.0 g/dL were selected using a non-probability purposive sampling technique.

The inclusion criteria comprised adolescent girl school childrens with haemoglobin levels below 12.0 g/dL, who were willing to participate in the study and were available during the period of data collection. Demographic variables were collected from all participants, and the pre-intervention haemoglobin level was assessed using a haemoglobin meter.

Following the pre-test assessment, the participants received the researcher-formulated Ragi laddu for a period of one month. After completion of the intervention, post-test haemoglobin levels were reassessed using the same haemoglobin meter to determine the effectiveness of Ragi laddu. The collected data were analysed using descriptive and inferential statistics to evaluate changes in haemoglobin levels and their association with selected demographic variables.

## TOOLS AND TECHNIQUE

### Description of the Tool

The tool used for data collection consisted of three parts:

**Part I: Demographic Variables:** This section included information regarding age, religion, family income, type of family, dietary pattern and habits, consumption of iron-rich foods, consumption of vitamin C-rich foods, history of anaemia during the previous year, history of excessive menstrual bleeding during the previous year, level of anaemia, and main source of information regarding anaemia.

**Part II: Assessment of Haemoglobin Level:** Haemoglobin levels of the participants were assessed using a haemoglobin meter before and after the intervention to determine changes in haemoglobin levels.

**Part III: Ragi Laddu Intervention:** Ragi laddu was prepared using ragi (finger millet), groundnuts, and jaggery. Ragi was cleaned, roasted, and ground into flour. Groundnuts were roasted and coarsely ground, while jaggery was prepared as syrup. The ingredients were thoroughly mixed and shaped into laddus. The prepared Ragi laddu was administered to the participants as the nutritional intervention for a period of one month.

### Scoring and Interpretation Procedure

The haemoglobin levels of the participants were measured in **g/dL** using a haemoglobin meter and classified according to the following criteria:

| Category         | Haemoglobin Level |
|------------------|-------------------|
| Normal           | 12.0–14.0 g/dL    |
| Mild Anaemia     | 10.0–11.9 g/dL    |
| Moderate Anaemia | 8.0–9.9 g/dL      |
| Severe Anaemia   | 6.5–7.9 g/dL      |

**Table 1:** Classification and interpretation of haemoglobin levels among the study participants.

### Data Collection Procedure

The haemoglobin assessment procedure was standardized using the cyanmethemoglobin method with a photoelectric colorimeter. Written permission was obtained from the head of the institution, and informed consent was obtained from the participants prior to data collection. The study was conducted among 60 adolescent girl school childrens who met the inclusion criteria were selected using a purposive sampling technique. Pre-intervention haemoglobin levels were assessed using a haemoglobin meter. From the following day, Ragi laddu was administered daily at 6:00 PM under the supervision of the researcher for 30 days. On the 31st day, haemoglobin levels were reassessed using the same instrument. The pre- and post-intervention haemoglobin levels were statistically analysed to determine the effectiveness of the Ragi laddu intervention.

### Statistical Analysis

The collected data were analysed using descriptive and inferential statistics. Frequency and percentage distributions were used to describe the demographic characteristics of the participants. Mean and standard deviation were calculated to assess the pre- and post-intervention haemoglobin levels. A paired t-test was used to determine the significance of the difference between pre- and post-intervention haemoglobin levels. The Chi-square test was used to determine the association between haemoglobin levels and selected demographic variables. Statistical significance was considered at  $p < 0.05$ .

## Results

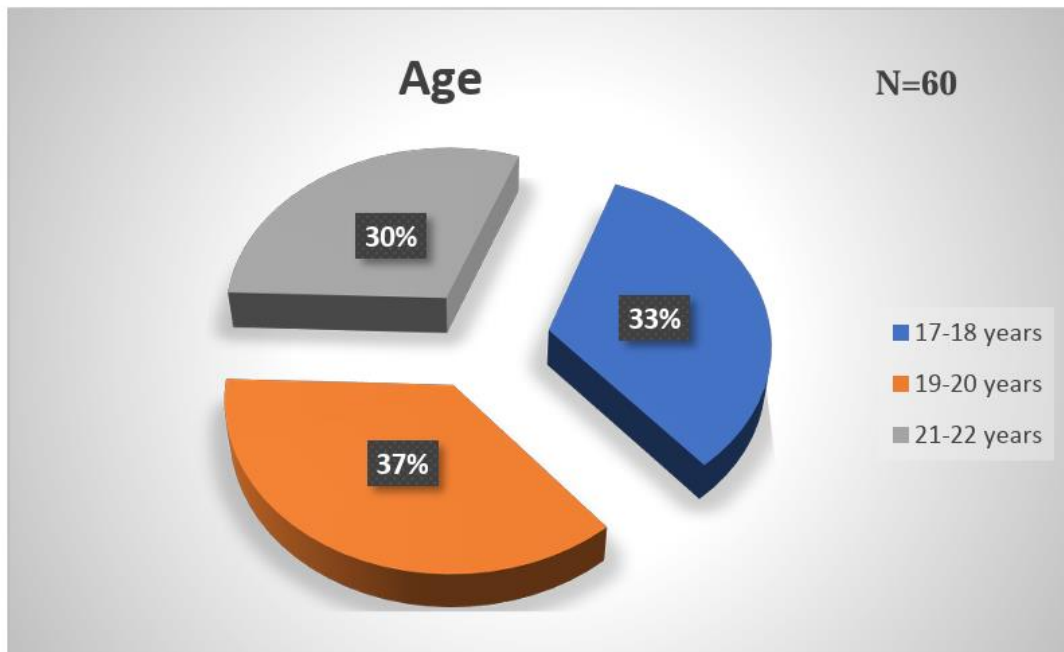


Figure 1: Simple bar diagram depicts percentage distribution of participants by age in years.

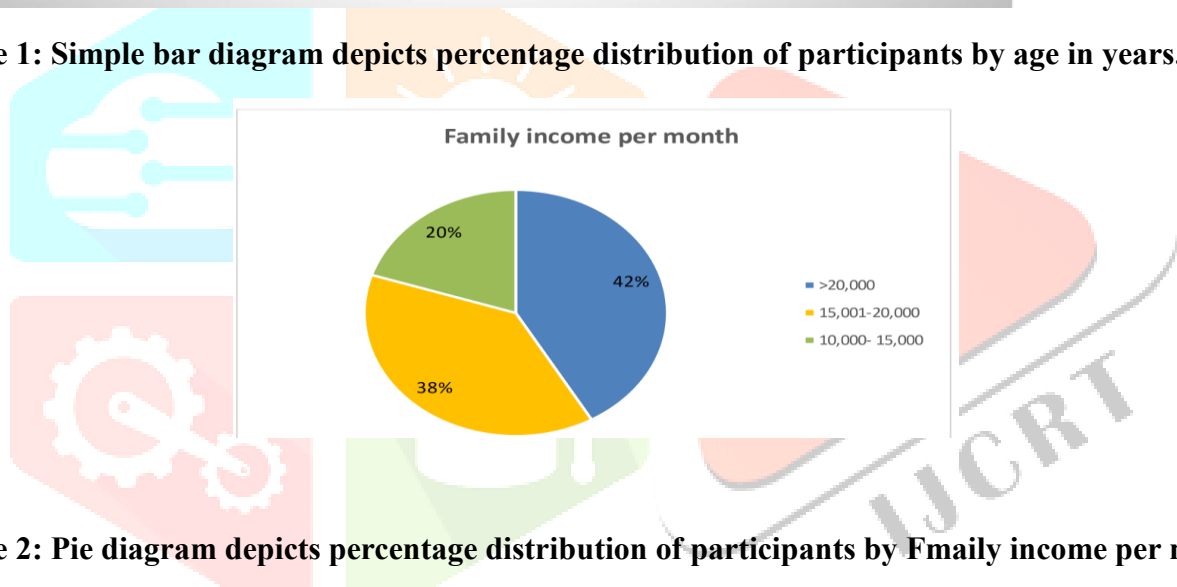


Figure 2: Pie diagram depicts percentage distribution of participants by Family income per month

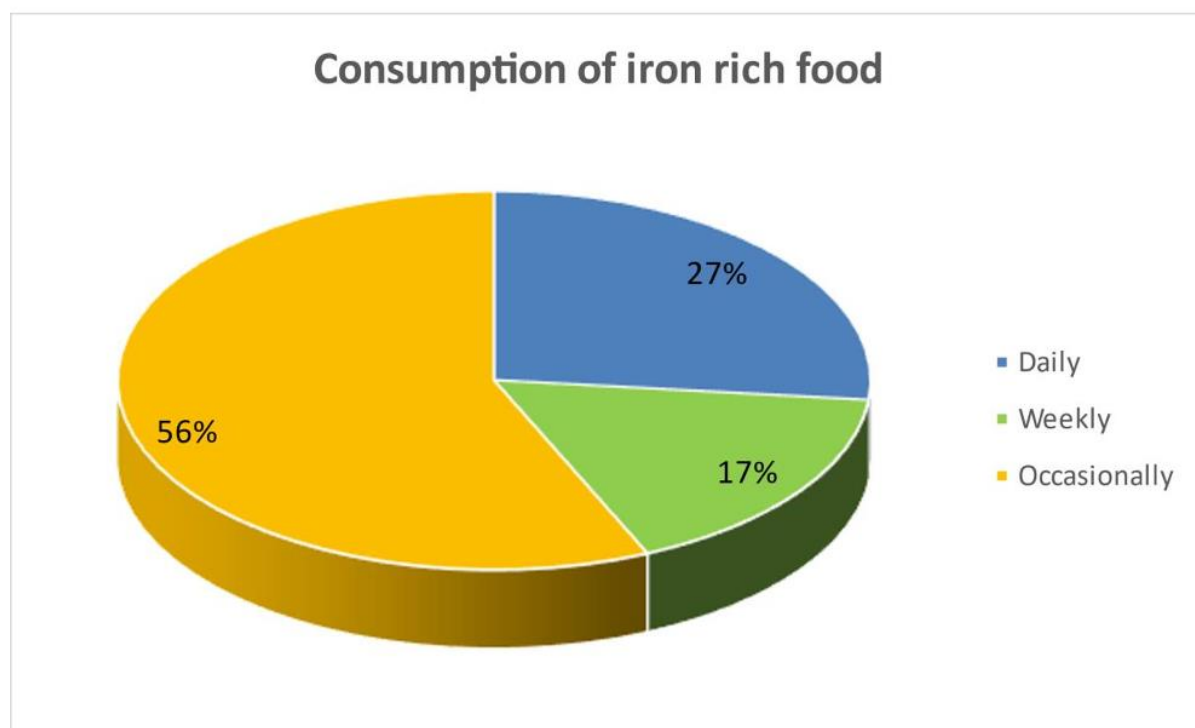


Figure 3: Pie diagram depicts percentage distribution of participants according to consumption of iron rich foods.

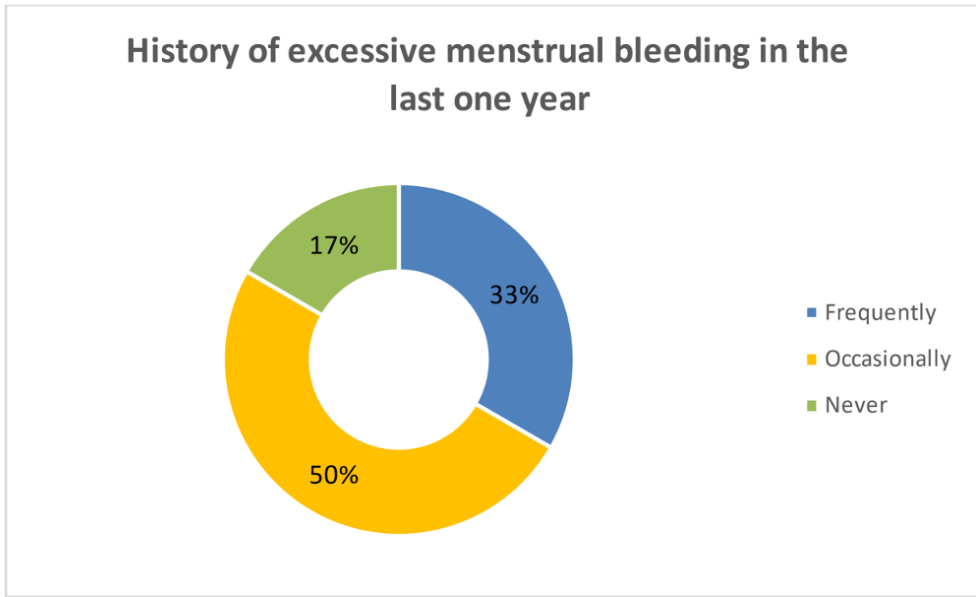


Figure 4: Pie diagram depicts percentage distribution of participants according to history of iron rich foods.

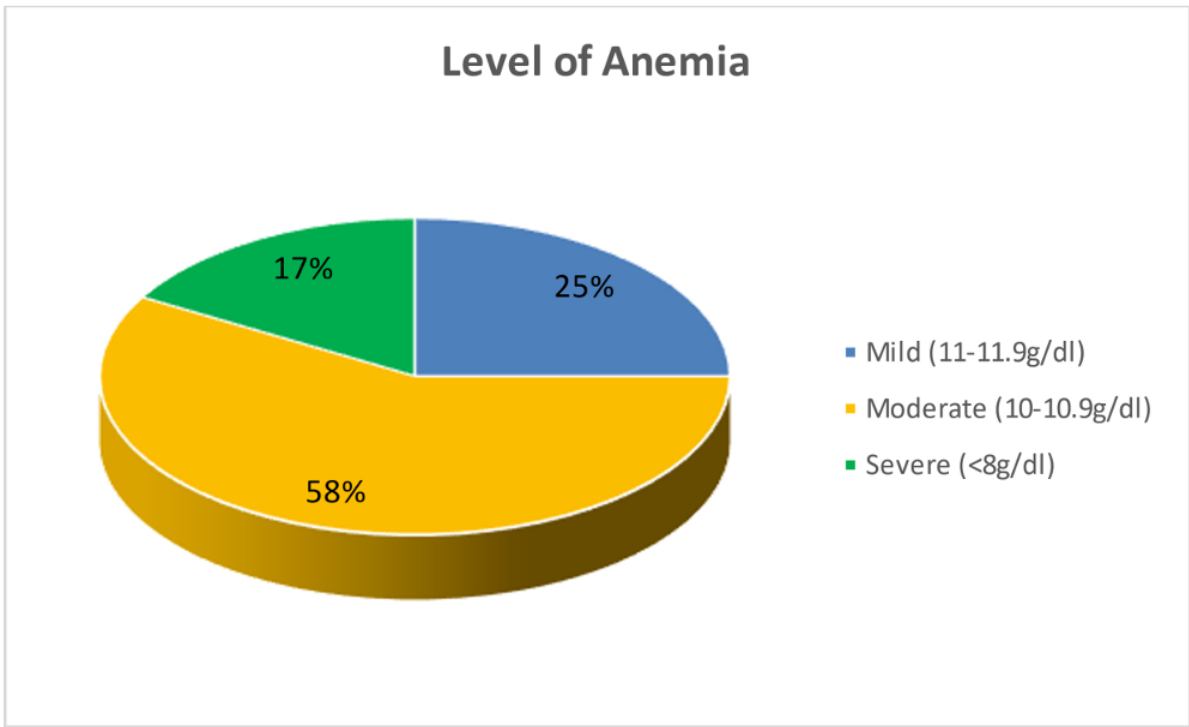


Figure 5: Pie diagram depicts percentage distribution of participants according to level of anaemia.

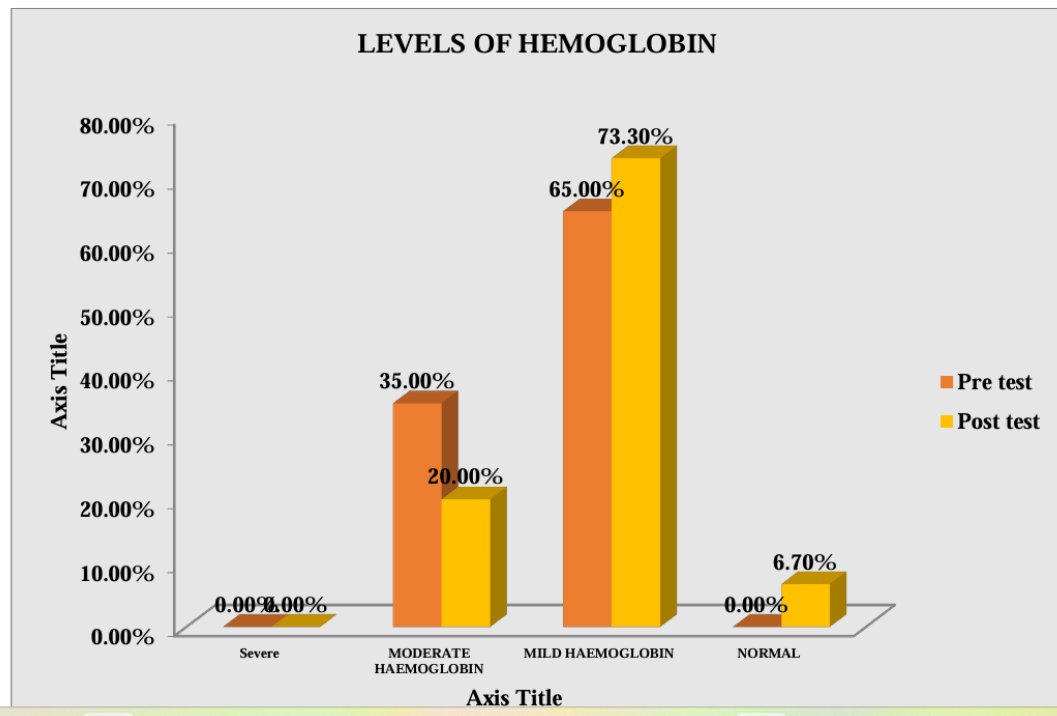


Fig no. 6 :levels of haemoglobin in pre and post test

Table no:2 Comparison between the pre and post intervention scores of mean and standard deviations for the haemoglobin level among the adolescent girl school childrens with Anemia.

| S.NO | VARIABLES  | PRE-TEST |       | POST-TEST |       | PAIRED<br>'t' |
|------|------------|----------|-------|-----------|-------|---------------|
|      |            | MEAN     | SD    | MEAN      | SD    |               |
| 1    | HEMOGLOBIN | 10.21    | 1.037 | 10.696    | 1.039 | 6.727         |

## Discussion

The mean pre-intervention haemoglobin level was  $10.21 \pm 1.037$  g/dL, which increased to  $10.696 \pm 1.039$  g/dL following the intervention, with a mean improvement of 0.486 g/dL. The paired *t*-test showed a statistically significant difference between the pre- and post-intervention haemoglobin levels ( $t = 6.727$ ,  $df = 59$ ,  $p < 0.05$ ). Thus, Ragi laddu supplementation for 30 days was associated with a significant improvement in haemoglobin levels among adolescent girl school childrens with anaemia. Hence, the research hypothesis ( $H_1$ ) was accepted.

In the post-test, there was an increase in the number of students with normal hemoglobin (6.7%), showcasing an improvement. However, mild anemia continued to prevail, increasing to 73.3% in the post-test. Moderate anemia decreased to 20.0%, indicating a significant difference in improving hemoglobin levels.

## Conclusion

The study concluded that Ragi laddu supplementation for 30 days significantly improved haemoglobin levels among adolescent girl school childrens with anaemia. The increase in mean haemoglobin level and reduction in the proportion of students with moderate anaemia demonstrated the potential effectiveness of the intervention. Ragi laddu, being a simple, affordable, locally available, and acceptable food-based intervention, may be incorporated as a supplementary dietary strategy for improving haemoglobin status among young women with anaemia. Further studies with larger samples and a control group are recommended to strengthen the evidence regarding its effectiveness.

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