



## A QUASI-EXPERIMENTAL STUDY TO EVALUATE THE EFFECTIVENESS OF GOOSEBERRY JUICE WITH HONEY ON THE LEVEL OF HEMOGLOBIN AMONG IRON-DEFICIENCY ANAEMIC ADOLESCENT GIRLS

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<https://doi.org/10.47211/idcij.2026.v13i02.003>

### ABSTRACT

Adolescence is the period when the individual can be shaped and moulded into great adults psychologically. The sense of identity and crisis of intimacy and isolation increases as adolescent progress towards young adulthood and move from dependency to the beginning of independence. Background: Anemia is a widespread nutritional disorder globally, with adolescents being particularly vulnerable due to rapid physical growth and increased nutritional requirements. Gooseberry is an excellent natural source of Vitamin C, which is known to enhance iron absorption. Objectives: This study aimed to assess the pre-intervention hemoglobin levels of anaemic adolescent girls, determine the effectiveness of supplementing their diet with gooseberry juice and honey, and associate these baseline levels with specific demographic variables. Methods: A quasi-experimental one-group pre-test/post-test design was utilized. The study included a purposive sample of 40 adolescent girls studying at Harsha College of Nursing in Bengaluru. Participants received 30 ml of gooseberry juice mixed with honey daily for 30 days. Hemoglobin levels were measured using a digital hemoglobinometer. Results: Prior to the intervention, 75% of the participants had moderate anemia and 25% had severe anemia. Following the 30-day intervention, 92.5% of the girls transitioned to moderate anemia and 7.5% to mild anemia, with no cases of severe anemia remaining. The paired t-test revealed a statistically significant improvement in hemoglobin levels ( $t = 25.910$ ,  $p \leq 0.05$ ). Conclusion: The administration of gooseberry juice with honey is highly effective in increasing hemoglobin levels and reducing the severity of iron-deficiency anemia among adolescent girls.

**Key Words:** Adolescent, Iron deficiency, Anemia, Gooseberry Juice.

### ABOUT AUTHORS:



Author, Sachin Ganapati Kadode is a Professor in the field of Nursing with extensive experience in teaching, research, and academic administration. He has been actively involved in guiding undergraduate and postgraduate nursing students and has contributed significantly to community health and clinical nursing education.



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## INTRODUCTION

The adolescent period represents a critical phase of rapid physical growth, characterized by significant increases in muscle mass, weight, and height. These physiological changes inherently demand heightened nutritional intake, placing adolescent girls at a distinctly high risk for nutritional deficiencies. The World Health Organization (WHO) estimates that anemia affects over two billion people worldwide, with 50% of these cases attributed directly to iron deficiency. In India, adolescents constitute over 20% of the population, and an estimated 50% of them suffer from iron-deficiency anemia.

Iron deficiency anemia reduces the work capacity of individuals and entire population bringing serious economic consequences and it may be obstacle to national development. Also iron deficiency anemia is one of the leading causes for morbidity. Iron deficiency has

effect on all systems in the human bodies. Long standing severe anemic may lead to congestive cardiac failure. Anemia caused by dietary factors is a readily preventable and treatable disease. While synthetic iron supplements are common, nutrients derived from natural, organic sources are much easier for the human body to assimilate. Gooseberry juice is rich in Vitamin C (ascorbic acid), Iron, Calcium, and Vitamin B-1. The high concentration of Vitamin C in gooseberries significantly enhances the body's ability to absorb iron cells, making it an excellent natural remedy for combating anemia. This study investigates the practical effectiveness of administering a natural dietary supplement—gooseberry juice combined with honey—on the hemoglobin levels of anaemic adolescent girls.

The adverse effect of iron deficiency anemia differs according to the age group. Example in case of pregnancy it can cause hemorrhage and shock. So thereby increase the risk of maternal and infant mortality. In case of school going children the concentration and intellectual skills are affected.

Numerous morbidity studies among school children have been carried out by individual researchers mostly in urban areas of India. The incidence of malnutrition including anemia is 40- 70%. Giving health education for prevention of preventable problems and development of healthy living practices, among students, which is one of the recommendations of the school Health Committee (Narayana 2001).

### Need for the study

Adolescence is the period when the individual can be shaped and moulded into great adults psychologically. The sense of identity and crisis of intimacy and isolation increases as adolescent progress towards young adulthood and move from dependency to the beginning of independence. Metamorphically adolescents change their behavior patterns and values as well. The rates of change in attitude, interest are seen as parallel to the rate of physical change in the growth and development of an adolescent, The emotional disturbance might lead them to react to frustration through maladjusted behavior, The behavior displayed by children were more in schools and colleges.

Anaemia in adolescent girls affects their physical work capacity and reproductive physiology and work productivity of adults. Although anaemia has been recognized as a public health problem for many years, little progress has been reported and the global prevalence of anaemia remains unacceptably high. WHO and UNICEF, therefore, reemphasize the urgent need to combat anaemia and stress the importance of recognizing its multifactorial aetiology for developing effective control programmes.

## METHODOLOGY

**Research Design and Setting** A quantitative, quasi-experimental research design (one-group pre-test post-test) was followed for this study. The research was conducted at Harsha College of Nursing which is located in Bengaluru, India.

### Population and Sampling

- **Sample Size:** The study used a sample of 40 adolescent girls of Harsha College of nursing.
- **Sampling Technique:** A non-probability purposive sampling technique was used to select the participants.
- **Inclusion Criteria:** The study included girls aged 17 to 19 years old, studying at Harsha College of Nursing, who had a baseline hemoglobin level between 8.1 and 11 gm/dl.
- **Exclusion Criteria:** Girls who had undergone major surgery within the last six months, possessed a history of bleeding disorders, were allergic to gooseberry juice, or were already undergoing treatment for severe anemia were excluded.



**Intervention** The intervention consisted of providing the participants a daily dietary supplement. Gooseberry flesh was extracted to create a juice. The researcher gave a mixture containing 25 ml of gooseberry juice and 5 ml of honey (totalling 30ml) to every participant once a day, before a meal and for 30 consecutive days.

**Data Collection and Instruments**

Data was collected using a two-part tool:

- **Section A:** A structured interview questionnaire to gather demographic variables including age, family income, dietary habits, and menstrual history.
- **Section B:** Bio-physiological measurements of hemoglobin levels using a digital hemoglobinometer.

**RESULTS**

**DEMOGRAPHIC CHARACTERISTICS**

**Table 1: Demographic Characteristics of Samples (N = 40)**

Variable	Category	Frequency (n)	Percentage (%)
Age	17 years	16	40%
	20 years	14	35%
	19 years	9	22.5%
	18 years	1	2.5%
Monthly Income	< ₹10,000	32	80%
	₹11,000–20,000	7	17.5%
	₹21,000–40,000	1	2.5%
Type of Family	Nuclear	28	70%
	Joint	12	30%
Dietary Pattern	Non-vegetarian	35	87.5%
	Vegetarian	5	12.5%
Age at Menarche	13 & 15 years	13	32.5%
	14 years	12	30%
	16 years	2	5%
Duration of Menstruation	3 & 5 days	15	37.5%
	4 & ≥6 days	5	12.5%
Previous Treatment	No	35	87.5%
	Yes	5	12.5%
Menstrual Cycle Length	21–28 days	23	57.5%
	>28 days	14	35%
	<21 days	3	7.5%

**HEMOGLOBIN LEVELS**

**Table 2: Pre- and Post-Intervention Hemoglobin Levels**

Level	Pre-Test (%)	Post-Test (%)
Severe	25%	0%
Moderate	75%	92.5%
Mild	0%	7.5%
Normal	0%	0%

**Effectiveness of the Intervention**

**Table 3: Effectiveness of Intervention**

Variable	Pre-Test	Post-Test	Result
Mean Hb	8.31	9.52	Increased
Standard Deviation	0.7415	0.7636	—
Paired t-value	—	25.910	Significant
Significance Level	p ≤ 0.05	—	Statistically significant



**Table 4: Association with Demographic Variables**

Variables	Association with Hb Level
Type of family	Significant
Dietary pattern	Significant
Duration of menstruation	Significant
Previous treatment of anemia	Significant
Menstrual cycle length	Significant
Age	Not significant
Monthly income	Not significant
Age at menarche	Not significant

### DISCUSSION AND CONCLUSION

The primary aim of this quasi-experimental study was to find out if a natural dietary intervention could effectively combat iron-deficiency anemia in adolescent girls. The data clearly showed that daily consumption of 30 ml of gooseberry juice mixed with honey significantly raised mean hemoglobin scores from 8.31 to 9.52 over just 30 days. The iron present in gooseberry juice is naturally assimilated with high amounts of ascorbic acid, it proves to be a highly effective, efficient and accessible method for enhancing the body's iron absorption capabilities. The complete eradication of severe anemia cases within the sample group highlights the clinical relevance of this simple, non-pharmacological intervention.

### NURSING IMPLICATION

The nurse's role may be essentially unchanged or it may entail different duties by possessing and practicing competencies making nurses better prepared to handle all types of emergencies. The investigator has drawn the following implications in the field of nursing education, nursing service, nursing administration and nursing research. Nurses are key personnel of a health team, who play a major role in the health promotion and maintenance. Nursing is a practicing profession so, the investigator, generally integrates findings into practice. The nurse as an administrator should implement formal teaching programme on prevention of anemia among adolescent girls.

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