

Research Article

A Study to Evaluate the Effectiveness of Amla Juice with Honey to Improve the Level of Haemoglobin Among Adolescent Nursing Students with Anaemia at Selected Nursing College, Hubballi

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Article History	Abstract
Received: July 24, 2026 Accepted: August 15, 2026 Published: August 21, 2026	Background: Anaemia is a global public health problem affecting both developing and developed countries. There are numerous treatments for anaemia, depending on the severity and primary causes. Among them, one of the most remedial measures is amla juice with honey, whereas amla contains a high amount of iron and is a rich source of vitamin C, and honey helps in maintaining the optimum level of red blood corpuscles and haemoglobin. It is considered one of the alternative therapies used for improving haemoglobin levels. Methodology: A quasi-experimental study was conducted among 30 adolescent nursing students (experimental group, 15 subjects, and control group, 15 subjects) at a selected nursing college in Hubballi. The study was selected by using a non-probability purposive sampling technique. The research design used for the study was a quasi-experimental, non-randomized control group design. Data were collected by using an interview schedule and assessment of haemoglobin through Sahli's method. Results: In the experimental group, pre-test findings showed that 07 (46.67%) had mild anaemia, 06 (40%) had moderate anaemia, and 02 (13.33%) had severe anaemia. In the post-test, 02 (13.33%) had no anaemia, 06 (40%) had mild anaemia, 07 (46.67%) had moderate anaemia, and none had severe anaemia. The paired <i>t</i> value was 17.35, which was greater than the tabulated value of 2.145, indicating a significant improvement in haemoglobin levels. In the control group, the pre-test and post-test distributions remained unchanged. The paired <i>t</i> value was 1.48. The unpaired <i>t</i> value was 3.46, indicating a significant difference between groups. Conclusion: The study concluded that the administration of amla juice with honey was found to be effective in improving the level of haemoglobin among adolescent nursing students. Keywords: Amla Juice, Honey, Haemoglobin, Anaemia.

Introduction/Need for the Study

There is no greater pillar of stability than a healthy, strong, and educated girl, as today's girl is tomorrow's mother.¹ The world's 16% of the population is in the age group of 10–19 years; India is home to 253 million adolescents, whereas Karnataka has 27.2% of its population comprising adolescents.² Many changes will take place at this age, which result in a series of hormonal changes, resulting in the gonads and reproductive organs becoming functionally mature. This may cause a girl to feel clumsy as the puberty hormones increase. In adolescents, it places a great demand on their nutritional requirements and makes them more vulnerable to anaemia.³ Anaemia is a condition in which the blood count and haemoglobin are lower than normal. It is a

pathological condition in which there is a decrease in the number of RBCs and their oxygen-carrying capacity in the blood.¹⁴ India is facing a grave public health problem, with a prevalence of anaemia of 58% in children (5–59 months), 54% in adolescent girls (15–19 years), 29% in adolescent boys (15–19 years), 53% in women of reproductive age, 50% in pregnant women, and 58% in breastfeeding mothers, as mentioned in the report given by the Ministry of Health and Family Welfare.⁴

Management of anaemia includes dietary changes. The best diet plan for anaemia includes foods rich in iron and other vitamins essential for haemoglobin and red blood cell production. It includes two types of iron in food: heme iron and non-heme iron. Heme iron is found in meat, poultry, and seafood. Non-heme iron is found in plant foods and foods fortified with iron. Some of these foods can be added to the diet to get more iron and help to fight iron deficiency anaemia, including leafy vegetables; vitamin C-rich foods, such as oranges; seeds and beans; amla; and nuts, which help to increase iron content in the body.⁵

One key advantage of Ayurveda over allopathy is that the herbs and plants it uses have minimal side effects. While allopathy focuses on treating symptoms, Ayurveda chooses to uproot the ailment from its roots. The treatment plan is holistic, natural, and safe, and does not cause any side effects to the recipient.⁶

Amla is a precious gift to mankind, which is cultivated throughout the world as a “super fruit.” A 100 g serving of fresh amla berries contains as much vitamin C as 20 oranges. Amla juice is a great source of vitamin C, which is a water-soluble vitamin that acts as an antioxidant. In fact, according to one research review, amla is one of the richest sources of vitamin C, packing 600–700 mg of vitamin C into each fruit.⁷

Honey is a sweet, viscous substance made by honey bees. Honey is used worldwide commercially and for human consumption. The main uses of honey are for cooking and as a sweetener in some beverages. Honey acts as an antioxidant, antifungal, and antibacterial agent. It helps increase the haemoglobin content in the blood by promoting its synthesis. It is considered one of the most valuable nutritional supplements, as 100 g of honey contains 0.42 mg of iron.⁸

Considering all the above points, the researcher became interested in evaluating the effectiveness of amla juice with honey for improving haemoglobin levels among the target group, i.e., girls with anaemia.

Objectives of the Study

- 1) To assess the level of haemoglobin among adolescent nursing students of the experimental group before the administration of amla juice along with honey.
- 2) To assess the level of haemoglobin among adolescent nursing students of the control group.
- 3) To evaluate the effectiveness of amla juice along with honey on the level of haemoglobin among adolescent nursing students of the experimental group in terms of the difference in post-test scores.
- 4) To compare the post-test scores regarding the level of haemoglobin among adolescent nursing students of the experimental group and the control group.
- 5) To find out the association between pre-test scores of the haemoglobin level among adolescent nursing students of the experimental group and their selected socio-demographic variables.
- 6) To find out the association between pre-test scores of the haemoglobin level among adolescent nursing students of the control group and their selected socio-demographic variables.

Material and Methods

Research Approach: Evaluative research approach

Research Design: Quasi-experimental, non-randomized control group design

Primary Source: Adolescent nursing students with anaemia

Research Setting: Selected nursing colleges in Hubballi

Sample: Adolescent nursing students with anaemia in selected nursing colleges in Hubballi

Sample Size: 30 adolescent nursing students with anaemia in selected nursing colleges in Hubballi, who were further divided equally into the experimental group ($n_1 = 15$) and the control group ($n_2 = 15$).

Criteria for Selection of the Sample

Inclusion Criteria:

Nursing students who were:

- ✓ Suffering from anaemia with a haemoglobin level of 7–10.9 g/dL;
- ✓ Present during the time of data collection;
- ✓ Willing to participate in the study.

Exclusion Criteria:

Nursing students who were:

- ✓ Sick with any other disorders during the time of data collection;
- ✓ Under medical treatment for anaemia.

Variables

Independent Variable: Amla juice with honey

Dependent Variable: Level of haemoglobin among adolescent nursing students with anaemia

Selection and Development of the Tool

Instrument: An interview schedule

Section I: Socio-demographic variables

Section II: Haemoglobin level assessment through Sahli's method

Section I: Socio-Demographic Variables

Items on socio-demographic data of adolescent nursing students with 11 variables that include age, habitat, religion, course of study, dietary pattern, type of family, educational status of the mother, educational status of the father, occupation of the father, occupation of the mother, and income."

Section II: Haemoglobin Level Assessment Through Sahli's Method

This section consists of 12 items regarding the level of haemoglobin among adolescent nursing students.

Steps for Preparation of Amla Juice with Honey

The steps for preparation of amla juice along with honey include:

- a) Take 100 g of fresh amla.
- b) Chop it roughly.
- c) Put the chopped amla into the mixer.
- d) Blend it for 5 minutes.
- e) Add 100 mL of water and strain the liquid.
- f) Add 1 teaspoon of honey, make the juice, and administer 100 mL per day before breakfast.

Results

The data were presented under the following sections.

Section I: Distribution of the sample characteristics according to socio-demographic variables.

Section II: Analysis and interpretation of the scores of subjects regarding the effectiveness of amla juice with honey on haemoglobin levels among adolescent nursing students.

Section III: Testing of hypotheses.

Section I: Distribution of the Sample Characteristics According to Socio-Demographic Variables

Table 1. Frequency and percentage distribution of samples according to their socio-demographic variables in both the experimental and control groups ($n_1 + n_2 = 30$).

S/N	Demographic variables		Experimental group		Control group	
			Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1	Age in years	16-18	0	0.00	04	26.67
		18-20	15	100.00	11	73.33
2	Habitat	Rural	07	46.67	07	46.67
		Urban	08	53.33	08	53.33
3	Religion	Hindu	08	53.33	06	40.00
		Muslim	02	13.33	03	20.00
		Christian	05	33.33	06	40.00
		Others	0	0.00	0	0.00
4	Course of study	GNM	15	100.00	15	100.00
		B.Sc. (N)	0	0.00	0	0.00
5	Dietary pattern	Vegetarian	05	33.33	10	66.67
		Mixed	10	66.67	5	33.33
6	Type of family	Nuclear	13	86.67	06	40.00

		Joint	02	13.33	06	40.00
		Extended	0	0.00	03	20.00
7	Education of mother	No formal education	02	13.33	04	26.67
		Primary education	04	26.67	04	26.67
		Secondary education	06	40.00	01	6.67
		Pre-university	01	6.67	02	13.33
		Graduation and above	02	13.33	04	26.67
8	Education of father	No formal education	00	0.00	03	20.00
		Primary education	06	40.00	03	20.00
		Secondary education	02	13.33	05	33.33
		Pre-university	03	20.00	03	20.00
		Graduation and above	04	26.67	01	6.67
9	Occupation of mother	Daily wage worker	0	0.00	0	0.00
		Private employee	04	26.67	01	6.67
		Govt. employee	02	13.33	01	6.67
		Homemaker	09	60.00	13	86.67
10	Occupation of father	Daily wage worker	01	6.67	01	6.67
		Private employee	04	26.67	02	13.33
		Govt. employee	02	13.33	03	20.00
		Self-employed	08	53.33	09	60.00
11	Income of parents/month	Rs. 10,000	05	33.33	01	6.67
		Rs. 15,000	04	26.67	10	66.67
		Rs. 20,000	03	20.00	02	13.33
		Rs. 25,000	03	20.00	02	13.33

Section-II: Analysis and Interpretation of Scores of Subjects Regarding the Effectiveness of Amla Juice with Honey on Haemoglobin Levels Among Adolescent Nursing Students

Table 2. Mean, median, mode, standard deviation, and range of subjects in the experimental group ($n_1 = 15$).

Area of analysis	Pre-test	Post-test	Difference
Mean	10	10.48	0.48
Median	9.8	10.3	0.5
Mode	8.9	9.4	0.5
Standard deviation	1.069	1.079	0.01
Range	3.4	3.5	0.01

Table 2 reveals that the pre-test mean score was 10, median was 9.8, mode was 8.9, standard deviation was 1.069, and range was 3.4. Whereas, in the post-test, the mean score was 10.48, median was 10.3, mode was 9.4, standard deviation was 1.079, and range was 3.5. The overall difference in the level of haemoglobin mean score was 0.48, median was 0.5, mode was 0.5, standard deviation was 0.01, and range was 0.01.

Table 3. Mean, median, mode, standard deviation, and range of subjects in the control group ($n_2 = 15$).

Area of analysis	Pre-test	Post-test	Difference
Mean	10.28	10.32	0.04
Median	10	10.3	0.3
Mode	9.44	9.3	0.14
Standard deviation	0.78	0.80	0.02
Range	2.6	2.3	0.3

Table 3 reveals that the pre-test mean score was 10.28, median was 10, mode was 9.44, standard deviation was 0.78, and range was 2.6, whereas the post-test mean score was 10.32, median was 10.3, mode was 9.3,

standard deviation was 0.80, and range was 2.3. The overall difference in the level of haemoglobin mean score was 0.04, median was 0.3, mode was 0.14, standard deviation was 0.02, and range was 0.3.

Table 4. Frequency and percentage distribution of the level of haemoglobin among adolescent nursing students with anaemia in both the experimental and control groups ($n_1 + n_2 = 30$).

S/N	Level of haemoglobin	Experimental group				Control group			
		Pre-test		Post-test		Pre-test		Post-test	
		(f)	%	(f)	%	(f)	%	(f)	%
1	No anaemia	00	00	02	13.33	00	00	00	00
2	Mild anaemia	07	46.67	06	40	08	53.33	08	53.33
3	Moderate anaemia	06	40	07	46.67	07	46.67	07	46.67
4	Severe anaemia	02	13.33	00	00	00	00	00	00

Table 5. Comparison of post-test scores on the level of haemoglobin and percentage distribution of adolescent nursing students in the experimental and control groups ($n_1 + n_2 = 30$).

Level of haemoglobin	Experimental group		Control group	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
No anaemia	02	13.33	0	0
Mild anaemia	06	40	08	53.33
Moderate anaemia	07	46.67	07	46.67
Severe anaemia	00	00	00	00

Section III: Testing Hypotheses

H₁: There will be a statistical difference between the post-test and pre-test scores regarding the level of haemoglobin among adolescent nursing students with anaemia in the experimental group at the 0.05 level of significance.

Table 6. Mean difference ($\bar{d}$), standard error of difference, and paired t value for the level of haemoglobin among adolescent nursing students in the experimental group ($n_1 = 15$).

Group	Mean difference ($\bar{d}$)	Standard error of difference ($S\bar{d} E$)	Paired 't' values	
			Calculated	Tabulated
Experimental group	0.486	0.107	17.35*	2.145
*Significant at 0.05 level				

H₂: There will be a statistical difference between the post-test and pre-test scores regarding the level of haemoglobin among adolescent nursing students with anaemia in the control group at the 0.05 level of significance.

Table 7. Mean difference ($\bar{d}$), standard error of difference, and paired t value for the level of haemoglobin among adolescent nursing students in the control group ($n_2 = 15$).

Group	Mean difference ($\bar{d}$)	Standard error of difference ($S\bar{d} E$)	Paired 't' values	
			Calculated	Tabulated
Control group	0.04	0.048	1.48	2.145
*Significant at 0.05 level				

H₃: There will be a statistical difference in post-test scores regarding the level of haemoglobin between the experimental group and the control group at the 0.05 level of significance.

Table 8. Comparison of post-test scores regarding the level of haemoglobin among adolescent nursing students and unpaired t value for the level of haemoglobin in the experimental and control groups ($n_1 + n_2 = 30$).

Experimental group		Control group		Mean difference ($\bar{d}$)	Standard error of difference ($S\bar{d} E$)	Unpaired 't' values	
Mean	SD	Mean	SD			Calculated	Tabulated
10.48	1.079	10.32	0.80	0.04	0.89	3.46*	2.048
*Significant at 0.05 level							

Thus, it becomes evident that amla juice with honey was effective in improving the level of haemoglobin among the experimental group at the 0.05 level of significance.

H₄: There will be a statistical association between pre-test scores of adolescent nursing students in the experimental group and their selected socio-demographic variables at the 0.05 level of significance.

Chi-square values revealed that there was no association between pre-test scores regarding the level of haemoglobin among adolescent nursing students in the experimental group and their selected socio-demographic variables. Hence, H₄ was rejected.

H₅: There will be a statistical association between pre-test scores of adolescent nursing students in the control group and their selected socio-demographic variables at the 0.05 level of significance.

Chi-square values revealed that there was no association between pre-test scores regarding the level of haemoglobin among adolescent nursing students in the control group and their selected socio-demographic variables. Hence, H₅ was not accepted.

Conclusions

Based on the findings of the study, the following conclusions were drawn:

- 1) The pre-test results showed that the girls had low haemoglobin levels.
- 2) The experimental group showed an increase in post-test scores regarding the level of haemoglobin among adolescent nursing students with anaemia after administration of amla juice along with honey.
- 3) The control group did not show significant differences between the pre-test and post-test scores regarding the level of haemoglobin among adolescent nursing students with anaemia.
- 4) Amla juice with honey was effective in improving the level of haemoglobin among adolescent nursing students in the experimental group when compared with the control group.

Implications of the Study

The findings of the study have several implications in various fields, which have been discussed in four areas, namely nursing education, nursing practice, nursing administration, and nursing research.

Declarations

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Artificial Intelligence (AI) Use Statement: The authors declare that no artificial intelligence (AI) tools were used in the conduct, analysis, interpretation, or writing of this study.

Author Contributions: TMA: Contributed to the study conception and design, data collection, administration of the intervention, haemoglobin assessment, data analysis, interpretation of results, and manuscript preparation; AHB: Contributed to study supervision, methodological guidance, interpretation of findings, critical review of the manuscript, and final approval of the manuscript.

Conflict of Interest: The authors declare no conflict of interest.

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Institutional Review Board Statement: The proposal for the study was approved by the Institutional Review Board of KLE'S Institute of Nursing Sciences, Hubballi.

Informed Consent Statement: The researcher approached all the nursing students with anaemia at KLE'S Institute of Nursing Sciences, Hubballi, and explained the nature of the study to them. They were informed that participation in the study was voluntary and that they could withdraw from it at any time. Anonymity and confidentiality of the collected data were also assured. Opportunities for asking questions about the study were provided. The participants were asked to sign the consent form. All data collected were kept strictly confidential.

Research Content: The authors confirm that the research presented in this manuscript is original and has not been published elsewhere.

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