RESEARCH ARTICLE

A PRE-EXPERIMENTAL STUDY TO DETERMINE THE EFFECTIVENESS OF AMLA ON INCREASING THE HEMOGLOBIN LEVEL AMONG ANAEMIC ADOLESCENT GIRLS STUDYING IN SELECTED COLLEGE, AT KIRUMAMBAKKAM, PUDUCHERRY

*Dr. P. Genesta Mary Gysel, Uma, R. and Santhi, R.

Sabari College of Nursing, Puducherry, INdia

ARTICLE INFO	ABSTRACT
	The main aim of the present study was to assess the effectiveness of amla on increasing the hemoglobin level among anaemic adolescent gilrs in selected college, at Kirumambakkam, Puducherry. The study samples were 50 anaemic adolescent girls selected from Sabari College of Nursing, Kirumambakkam by using convenient sampling technique non randomnly. The knowledge level was assessed regarding anaemia to anaemic adolescent girls. In pre-test, blood samples were taken and the adolescent girls were classified based on the hemoglobin level.100gm of amla was provided by the investigator for one month after breakfast and lunch. In post-test, blood samples were taken. Comparing the pre-test and post-test values of hemoglobin, the pre test mean value of hemoglobin is 9.97 and the post test mean value of hemoglobin is 10.71and the difference is 0.74 and the p value is < 0.001 and so it is highly significant. By providing amla the investigator proved the study is highly effective in the improvement of hemoglobin level among anaemic adolescent girls. Since the amla was effective in improving hemoglobin, it was also suggested to be continued in order to uplift the overall health of adolescent girls. Hence, it will help to reduce the incidence of anaemia and enhance the quality of life in future.

INTRODUCTION

Health is a fundamental human right and health is central to the concept of quality of life. Adolescents is a period of second decade of life and constitute over one fifth of India's population. Adolescence begins when the secondary sex characteristics appear and ends when somatic growth is completed and the individual is psychologically mature, capable of becoming a contributing member of society. Adolescents are in the age group of 12 to 18 years. The girl should have weight approximately 42-64 kg and height approximately 155-169 cm. Adolescence is a critical stage in the life cycle, when the health of females is affected due to growth spurt, beginning of menstruation, poor intake of iron due to poor dietary habits and gender bias. Iron deficiency anaemia affects over 60% of the adolescent girls in India. Anaemia in adolescent girls has far-reaching implications. The anaemic adolescent girls grow into adult women with compromised growth, both physical and mental conditions. These women have low pre-pregnancy weight, and are more likely to die during childbirth and deliver low birth weight babies.

Corresponding author: **Dr. P. Genesta Mary Gysel**
Sabari College of Nursing, Puducherry

Iron deficiency is the most common etiological factor in anaemia. The decreased haemoglobin level is called as iron deficiency anaemia. Anaemia is a serious public health problem, which affects the mental and physical development, as well as health maintenance and work performance. Iron deficiency is by far the most common cause of anaemia worldwide.

Need for the Study: About 2 billion people suffer from varying degrees of anaemia in developing countries. Iron deficiency occurs when insufficient iron is absorbed to meet the body's needs. This may be due to inadequate iron intake, poor iron absorption, increased iron need or chronic blood loss. Prolonged iron deficiency leads to iron deficiency anaemia (IDA). Adolescence is the period when the individual can be shaped and moulded into great adults psychologically. India is one of the fastest growing youth populations in the world with an estimate 190 millions adolescent of which 22% are girls, the government of Tamilnadu Directorate of public health and preventive medicine [2002] conducted a study on prevalence of anaemia among adolescent girls in the rural were anemic. Directorate of public health reports stated that 3.44% of school adolescents are anemic out of which 59% of them are received iron & folic tablets. Anaemia is one of the most widespread

public health problems, especially in developing countries like India & has important health & welfare, social & economic consequences, these include repaired cognitive development, reduced physical work & in severe cases, increased risk of mortality particularly during the perinatal period. There is also evidence that anaemia may result in reduced growth & increased morbidity. Given the magnitude of the problem, greater efforts are needed to develop & implement programs both to prevent & to control anaemia.

Statement of the Problem: A pre-experimental study to determine the effectiveness of amla on increasing the hemoglobin level among anaemic adolescent girls studying in selected college, at kirumambakkam, puducherry.

Objectives

- To classify the adolescent girls according to the hemoglobin level.
- To assess the level of knowledge on anaemia among adolescent girls.
- To determine the effectiveness of amla on increasing hemoglobin level among anemic adolescent girls.
- To associate the hemoglobin level on experimental group with the selected demographic variables.

Operational Definitions

Assess: The statistical measurement of knowledge among adolescent girls regarding anaemia based on closed ended questionnaire.

Anaemia: Anaemia is a physiological condition with decrease in the total amount of red blood cells or hemoglobin in the blood or a lower ability of the blood to carry oxygen which leads to tissue hypoxia.

Effectiveness: It refers to the extent to which the amla will increase the hemoglobin level of anemic adolescent girls which can be measured by hemoglobin level.

Adolescent: Girls who are in the age group of 17-19 years and studying in selected colleges, Kirumambakkam.

Amla: It is an edible fruit, which is rich in vitamin C will enhance the absorption of hemoglobin thereby increasing the hemoglobin level of anaemic adolescent girls.

Hypotheses: There will be significant difference in the level of hemoglobin of the anaemic adolescent girls who have taken amla in the pre-test and post-test value.

Assumptions

- Knowledge on anaemia among adolescent girls may helps to reduce the incidence of iron deficiency anaemia.
- Consumption of amla will enhance the absorption of hemoglobin thereby increasing the hemoglobin level of anemic adolescent girls.
- Knowledge is the base for practice.

MATERIALS AND METHODS

A quantitative research approach was adopted for this present study. A pre expremental one group pre testpost test research

design was used. It was conducted in sabari college of nursing at kirumampakkam. The population of this study was adolescent girls with the age group of 17-19 years, studying in the selected college at Kirumambakkam, Puducherry. The sample was adolescent girls in the age group of 17 – 19 years who were studying in 1st and 2nd year of B.sc nursing programme and the sample size　was 50 students. The sampling technique adopted for the study was non-probability purposive sampling technique.

Criteria for Sample Selection

Inclusion criteria

- Adolescent girls in the age group of 17-19 years.
- Adolescent girls with hemoglobin level less than 11 g/dl
- The samples who were willing to participate.

Exclusion criteria

- The students who were not willing to participate in this study.
- The students who were on medical treatment.
- The students with any systemic disease.

Table 1. Frequency and percentage distribution of demographic variables among anaemic adolescent girls

n = 50

Sl. No	Demographic variables		Frequency (%)	Percentage (%)
1.	Age	17-18years	3	6
		18-19 years	20	40
		19-20 years	27	54
2.	Family type	Nuclear	47	94
		Joint	3	6
3.	Family income per month	2001-6000	11	22
		6001-10000	16	32
		10001-15000	12	24
		15000-20000	5	10
		20001-40000	5	10
		>40000	1	2
4.	Dietary pattern	vegetarian	2	4
		non vegetarian	48	96
5.	Chronic childhood illness	yes	2	4
		no	48	96
6.	Attended anaemia awareness programme	Yes	4	8
		no	46	92
7.	Source of information	friends	4	8
		mass media	6	12
		books	40	80
8.	Number of children	2	36	72
		3	13	26
		4 and above	1	2
9.	Worm infestation	yes	5	10
		no	45	90
10.	Iron and folic acid supplementation	yes	11	22
		no	39	78

Regarding the age, 3(6%) adolescents were 17 years, 20(40%) were in 18 years, 27(54%) were in 19 years. In relation to type of family, 47(94%) were nuclear family, 3(6%) were in joint family. to income, 11(22%) were in 2001-6000, 16(32%) were in 6000-10000, 12 (24%) were in 10001- 15000, 5(10%) were in 15000-20000, 5(10%) were in 20001-40000, 1(2%) were in >40000.

- In relation to the dietary pattern, 2(4%) were vegetarian, 48(96%) were non vegetarian.
- In relation to chronic childhood illness, 2(4%) were suffered, 48(96%) were unsuffered.
- Regarding anaemia awareness attended programme, 4(8%) were attended, 46(92%) were not attended.
- In relation to source of information, 4(8%) were from friends, 6(12%) were from mass media, 40(80%) were from books.
- Regarding number of children at home, 36(72%) were 2 children, 13(26%) were 3 children, 1(2%) were 4 children.
- In relation to worm infestation, 5(10%) were affected, 45(90%) were not affected.
- In relation to consuming iron and folic acid supplementation, 11(22%) were consumed, 39(78%) were not consumed.

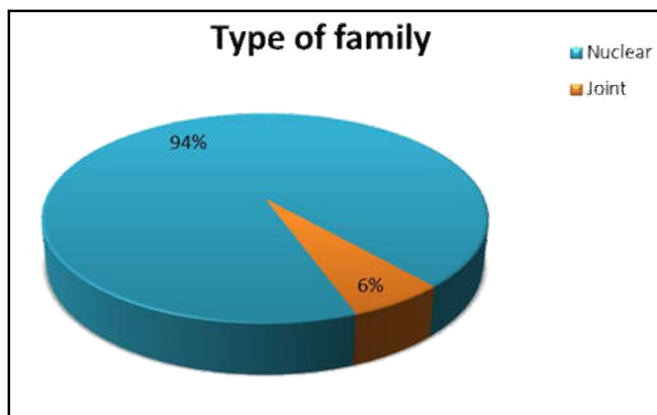**Figure 3. Distribution of age among anemic adolescent girls**
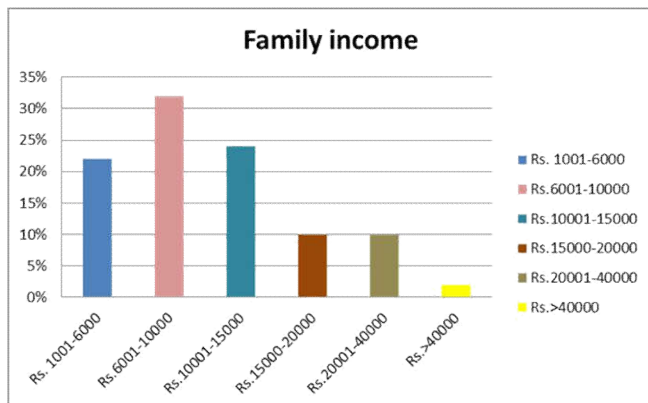

Figure 4. Distribution of type of family

Figure 5. Distribution of family members based on the income
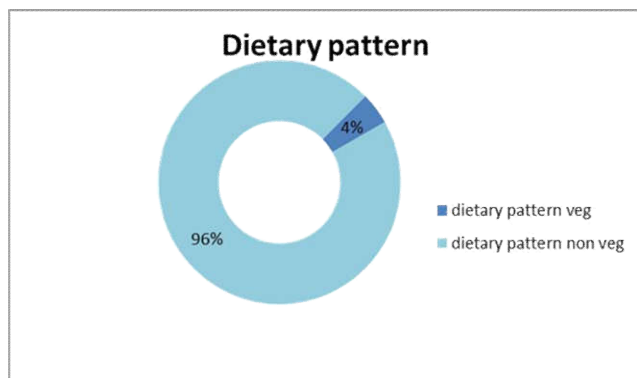

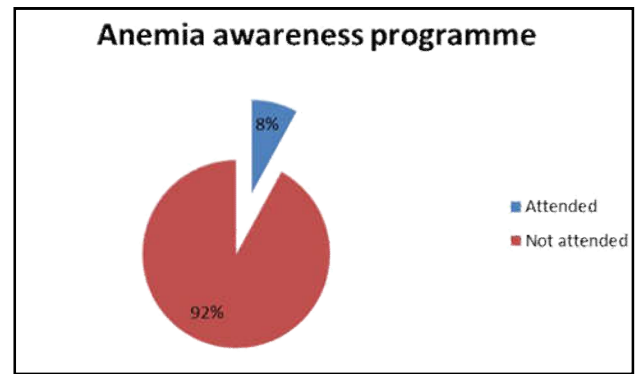**Figure 6. Distribution of adolescent girls based on the dietary pattern**

Figure 7. Distribution of adolescent girls based on anaemia awareness programme attended

Section II: Distribution on classification of anaemia based on pre-test and post-test value of hemoglobin among anaemic adolescent girls.

Table 2. Frequency and percentage distribution on classification of anaemia based on pre-test and post-test value of hemoglobin among anaemic adolescent girls

Classification of	Pre-test		Post-test	
Anaemia	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
Mild anaemia	41	82	19	38
Moderate anaemia	8	16	9	18
Severe anaemia	1	2	0	0
No anaemia	0	0	22	44

The table 4.2.1 shows that mild anaemia 41 students 82% in pre-test and 19 students 38% in post-test. Moderate anaemia 8 students 16% in pre-test and 9 students 18% in post-test. Severe anaemia 1 student 2% in pre-test and no student in post-test. No anaemia in pre-test is 0 and 22 students 44% in post-test.
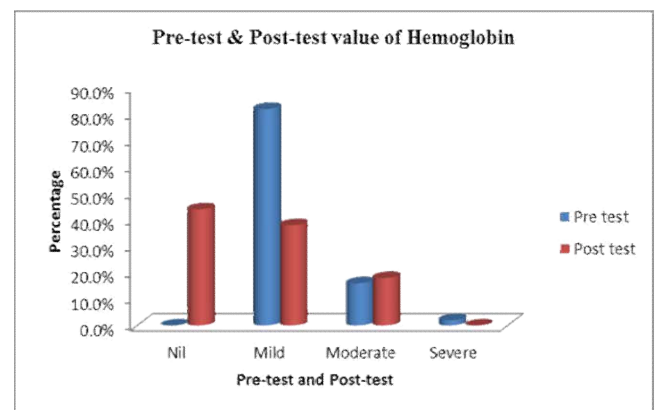
Figure 8. Distribution on classification of anaemia based on pre-test and post-test value of hemoglobin among anaemic adolescent girls

Section III: Frequency and percentage distribution of level of knowledge on anaemia among anaemic adolescent girls.

Table 1. Frequency and percentage distribution of level of knowledge among anaemic adolescent girls

Level of knowledge	No. of students (n)	Percentage (%)
Inadequate	32	64%
Moderately adequate	18	36%
Adequate	0	0%
Total	50	100%

Table 4.3.1 shows that frequency and distribution of level of knowledge among anaemic adolescent girls, it shows that inadequate knowledge were 32 (64%), moderately adequate knowledge were 18(36%), and there is no adequate knowledge.

Section IV: Comparison of pre-test and post-test value of hemoglobin level among anaemic adolescent girls.
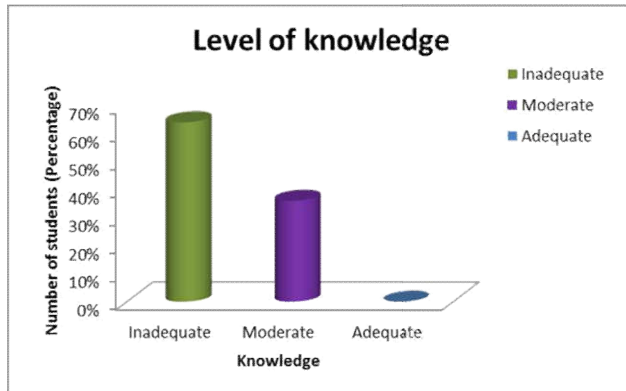
The table 4.4.1 reveals that the paired "t"- test value of hemoglobin t=4.03, mean difference is 0.74 and the p value is p<0.001, Hence it is highly significant when compared to the pre-test and post-test value of hemoglobin among anaemic adolescent girls. The table 4.5.1 show that there is no significant association between pre-test value of hemoglobin with the selected demographic variables such as age in years,
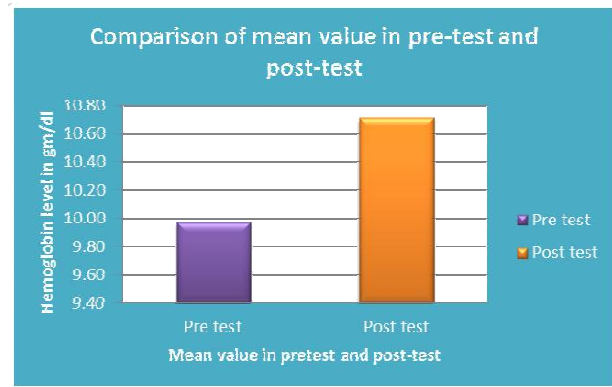

Figure 9. Distribution of level of knowledge among anaemic adolescent girls

Figure 10. Level of hemoglobin in pre-test and post-test among anaemic adolescent girls

Table 4. Comparison of pre-test and post-test value of hemoglobin among anaemic adolescent girls

Variable	Pre-test			Post-test			Mean difference	t-test	p-value
	Mean	SD	SE	Mean	SD	SE			
Level of hemoglobin	9.97	0.87	0.12	10.71	1.46	0.21	0.74	4.03	<0.001

Table 5. To associate the pre-test value of hemoglobin with the selected demographic variables

Sl. No.	Demographic variables	Frequency (n)	Level of Hemoglobin			KW / MW Test	p- value
			Mean	Median	Standard Deviation		
1.	Age						
	a) 17-18 years	3	9.5	9	0.87	1.1295	0.5685
	b) 18-19 years	20	9.92	10.15	1.02		
	c) 19-20 years	27	10.06	10.2	0.76		
2.	Type of family						
	a) Nuclear	47	9.94	10.2	0.88	1.1295	0.5688
	b) Joint	3	10.4	10.6	0.72		
3.	Family income per month						
	a) 2001-6000	11	10.11	10.2	0.7		
	b) 6001-10000	16	10.09	10.35	0.98	3.5580	0.6146
	c) 10001-15000	12	9.92	9.9	0.86		
	d) 15000-20000	5	9.96	10.4	1.01		
	e) 20001-40000	5	9.64	9.7	0.9		
	f) >40000	1	8.8	8.8	--		
4	Dietary pattern						
	a) Vegetarian	2	9.4	9.4	0.85	2.8334	0.2425
	b) Non vegetarian	48	19.03	19.2	1.87		
5	Chronic childhood illness						
	a) Yes	2	10.15	10.15	0.64	0.0154	0.9013
	b) No	48	9.96	10.2	0.88		
6	Attended programme						
	a) Yes	4	9.92	10.25	0.83	0.0928	0.7607
	b) No	46	9.97	10.15	0.88		
7	Source of information						
	a) Friends	4	10.05	10.4	1	0.0543	0.9732
	b) Mass media	6	10.02	10.05	0.81		
	c) Book	40	9.96	10.15	0.89		
8	Number of children						
	a) 2	36	9.92	10.2	0.9	0.7161	0.6900
	b) 3	13	10.12	10.2	0.83		
	c) 4 and above	1	9.8	9.8	--		
9	Worm infestation						
	a) Yes	5	9.72	9.8	0.88	0.6303	0.4273
	b) No	45	10	10.2	0.88		
10.	Iron and folic acid Supplementation						
	a)Yes	11	9.8	10.3	1.25	0.0050	0.9999
	b) No	39	10.02	10.1	0.75		

type of family, family income per month, dietary pattern, chronic childhood illness, attended programme on anaemia awareness, sources of information, number of children, worm infestation, iron and folic acid supplementation, since the p value is not less than p<0.05 and so it is not associated with the selected demographic variables.

Major Findings of the Study

- The distribution of level of knowledge among 50 anaemic adolescent girls. Out of 50 samples, there is no adequate knowledge, 18 (36%) were moderately adequate knowledge, 32 (64%) were inadequate knowledge.
- In pre-test Mild anaemia 41 students (82%), Moderate anaemia 8 students (16%), Severe anaemia 1 student (2%). no anaemia is 0
- In post test mild anaemia 19 students (38%), moderate anaemia 9 students (18%), and severe anaemia 0 in post-test, no anaemia 22 students (44%) after giving amla for 1 month.
- The mean value in pre-test is 9.97 and 10.71in post-test, the mean difference is 0.74, the p value is <0.001 and so it shows that the study is highly significant.

Recommendations

Based on the finding of the study the following recommendation have been made for the further study. The similar study can be conducted among pre - menarchial girls in a aspect of primordial prevention. Replication of the study may be done with large sample. Effectiveness of amla can be assessed by adding iron rich sources in diet in a view of improving hemoglobin level among anaemic adolescent girls.

REFERENCES

Anushiya, V. 2015. Effectiveness of amla juice among anaemic adolescentgirls on iron deficiency anaemia in government Manohar school at sellur, Madurai, Dr.M.G.R University.

G S toteja, padamsingh, B S Dhillon, 2017. prevalence of anaemia amongadolescent girls and pregnant women in 16 districts of india, article in food and nutrition bulletin 27(4), www.researchgate.net.

Rajaratnam j et al, 2016. Prevalence of anaemia among adolescent girls of ruraltamilnadu, journal of indian pediatrics, https://www.ncbi.nlm.nih.gov>pubmed.

Anindomajumdar, 2013. Prevalence and risk factors of anaemia amongadolescent girls residing in a rural communityof Puducherry, *Indian journal of maternal anf child health,* volume 15(4), www.academia.edu

Bhimrao N Jadhav, 2018. A crictical review on iron deficiency anaemia infemale population of developing India, *International journal of Fauna and Biological studies.*

Navinkumarangadi,A.Ranjitha,2017. knowledge, attitude and practice aboutanaemia among adolescent girls in urban slums of Davangere city, Karnataka, *J.M Medical college Davangere,* july 20, 2015.

Vincent lannelli et al, 2014. Study of anaemia, american journal of association.

World health organization, 2012. anaemia, www.who.int>topics>anaemia.

Purushothama, Suseela,Rakesh, 2017. Prevalence of anaemia in kerala statesouthern India-a systematic review, *journal of clinical and diagnostic research (JCDR)*

Nirmala limbu et al, 2016. A study to assess the prevalence of anaemia inadolescent girls, *journal of medicine and public health.*

Dr. Harindersingh, Dr. Hardeepsinghgill, Dr.Gurmanpreet, 2015. To find theprevalence of anaemia among school girls, *scholar journal of applied medical sciences(SJAMS).*

De Andrade cairo, Rodiguessilva, N. CarniroBustani, 2014. prevalence ofiron deficiency anaemia among adolescent, research gate.net 1240-9

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