



A STUDY TO ASSESS EFFECTIVENESS OF BEETROOT JUICE ON SERUM IRON AMONG NURSING STUDENTS WITH IRON DEFICIENCY ANEMIA IN SELECTED COLLEGE OF JALANDHAR CANTT

Nursing

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ABSTRACT

Iron deficiency anemia (IDA) is a significant nutritional issue worldwide, particularly affecting over half of India's population and up to 70% of nursing students. This study aimed to evaluate the efficacy of beetroot juice in improving serum iron levels among nursing students with IDA in Jalandhar Cantt. Utilizing a quasi-experimental pre-test post-test design, 46 nursing students with serum iron under 60 mcg/dl were randomly selected. Participants in the experimental group consumed 100 ml of beetroot juice daily for 60 days, while the control group received no intervention. Pretest and post-test data were collected to measure the outcomes. Results indicated a significant difference in serum iron between the groups, showcasing notable improvements in the experimental group. The study concludes that beetroot juice effectively alleviates serum iron levels of iron deficiency anemia in nursing students.

KEYWORDS

Effectiveness, Iron Deficiency Anemia, serum iron

INTRODUCTION

Iron deficiency anemia occurs when body doesn't have enough iron. Iron is important because it helps get enough oxygen throughout body. If a person do not have enough iron, body makes fewer and smaller red blood cells. Then body has less hemoglobin, and a person cannot get enough oxygen. Iron deficiency is the most common cause of anemia. The most severe consequence of iron depletion is iron deficiency anemia (IDA) and it is still considered the most common nutrition deficiency worldwide.

The study investigates the critical health issue of anemia among adolescents, particularly nursing students, highlighting its prevalence, causes, and If a person do not have enough iron, body makes fewer and smaller red blood cells. Then body has less hemoglobin, and a person cannot get enough oxygen. Iron deficiency is the most common cause of anemia.¹⁶ The most severe consequence of iron depletion is iron deficiency anemia (IDA) and it is still considered the most common nutrition deficiency worldwide. implications. According to the World Health Organization (WHO), health encompasses complete physical, mental, spiritual, and social well-being, extending beyond mere absence of disease. Adolescents, defined as individuals aged 10-19, experience rapid development and are notably vulnerable to nutritional deficiencies, mainly anemia.

In India, it is estimated that 70% of nursing students suffer from anemia, a reflection of widespread iron deficiency primarily driven by inadequate nutritional intake and high menstrual blood loss.

Adolescence is characterized by three sub-phases: early (ages 11-14), middle (ages 15-17), and late (ages 18-20). This stage is critical for establishing dietary habits and nutritional status, which can substantially influence both present and future health outcomes. Nutritional demands increase during this phase due to physical growth and the onset of menstruation, reinforcing the need for intake of iron-rich foods and a balanced diet.

Globally, anemia affects approximately 1.62 billion individuals, with an alarming 47.4% prevalence in adolescents. India presents the highest rates of iron deficiency anemia among women and adolescents worldwide. Iron deficiency anemia, the most prevalent type among nursing students, poses serious health threats due to chronic blood loss and heightened iron requirements during rapid growth periods.

In summary, addressing the high rates of anemia in Indian nursing students is critical for safeguarding their health and ensuring better maternal and neonatal outcomes in the future. Strategies to improve dietary intake, enhance health education, and augment access to nutritional resources are essential in combating this public health challenge.

Anemia Database Among Reproductive Age Group

General Details

- 1) Non pregnant women age 15 -49 years who are anemic (<12.0 g/dl) in Urban - 72.1% and rural- 86.1%
- 2) Pregnant women age 15-49 years who are anemic (<11.0 g/-dl)
- 3) All women age 15 -49 years who are anemic in urban -70.6% and rural -86.6%

Objectives Of Study

1. Assess the pretest and posttest level of serum iron among nursing students among control and experimental group
2. Assess effectiveness of beetroot juice on serum iron among nursing students among control and experimental group.
3. Find association between pretest level of serum iron with selected demographic variables among nursing students between control and experimental group.

HYPOTHESIS

- H1: There will be significant difference between the level of serum iron before and after the administration of beetroot juice among nursing students in experimental group.
- H2: There will be a significant association between the pretest level of serum iron with selected demographic variables among nursing students among control and experimental

METHODOLOGY RESEARCH APPROACH

A quantitative approach is used to determine the effectiveness of beetroot juice upon Serum Iron, among nursing students with iron deficiency anemia

RESEARCH DESIGN

A Quasi-experimental pretest posttest design is adopted for conducting the study.

SYMBOLIC PRESENTATION OF QUASI-EXPERIMENTAL RESEARCH DESIGN

Experimental group:		
Pretest	treatment	posttest
O1	X	O2
Control group:		
Pretest	treatment	posttest
O1	-	O2

KEY:

- O1-Pretest assessment of serum iron in experimental group
 O1- Pretest assessment of serum iron in control group
 O2- Posttest assessment of serum iron in experimental group
 O2- Posttest assessment of serum iron in control group
 X – Nursing Intervention - Administration of beetroot juice for the experimental group.

Research Setting

The study was conducted in Jalandhar Cantt. The experimental group and control group were selected from Army College of Nursing, Jalandhar Cantt.

Population

In the present study, the accessible population is nursing students with iron deficiency anemia residing in Army College of Nursing, Jalandhar.

SAMPLE

Sample is the number of individuals from whom the required information is obtained. In the present study the sample was 46 nursing students having iron deficiency anemia divided into two groups as in 23 control group and in 23 experimental group residing in Army College of Nursing.

DESCRIPTION OF TOOLS

TOOL 1: Demographic Characteristics

In the demographic characteristics total 9 items.

TOOL 2: Blood Investigations

It consists of patient value of blood reports.

DATA COLLECTION PROCESS

The study was conducted at Army College of Nursing Jalandhar. Written permission and consent were obtained. The selection of sample was done by lottery method and the students whose Hb level was less than 11.9GM/DL were investigated for serum iron. The students whose serum iron level less than 30mcg/dl were selected for the study. Sample size was 46 nursing students and their pre posttest serum iron levels were assessed. The beetroot juice was by 100gm of beetroot powder mixed with 1000ml of water, 100gm of sugar, 100ml of lemon juice and 10ml of ginger juice. Each participant in experimental group was given 10ml of beetroot juice for 60 days and no intervention Was given to control group. The pretest data was collected for both group one day prior to the study and posttest conducted in 61st day of pretest.

RESULT

This section deals with the description of elevation of serum iron in experimental group and is explained in frequency and percentage distribution.

Table1: Frequencies And Percentage Distribution Of Sample Characteristics Based On Demographic Variables n=(23+23=46)

S. No.	Characteristics	Experimental Group		Control Group	
		F	%	F	%
1	Age (in years)				
	18 – 19	3	13.04	4	17.39
	20 – 22	15	65.22	12	52.18
	22 – 24	5	21.74	5	21.74
	24 – 26	0	0	2	8.69
2	Educational class				
	2 nd Semester	00	00	10	43.48
	4 th Semester	09	39.13	05	21.74
	6 th Semester	14	60.87	00	00
	4 th Year	00	00	08	34.78
3.	Have you attained menarche				
	Yes	23	100	23	100
	No	00	00	00	00
4	Age at menarche				
	12	03	13.04	04	17.39
	13	10	43.48	09	39.13
	14	10	43.48	07	30.44
	15	00	00	03	13.04
5	Menstrual regularity				
	Regular	17	73.91	21	91.31
	Irregular	06	26.09	02	8.69
6	Monthly family income				
	<5001	00	00	00	00
	5001-10000	00	00	01	4.35
	10001-15000	05	21.74	01	4.35
	>15000	18	78.26	21	91.30

7	Type of family Joint family Nuclear family	08	34.72	04	17.39
		15	65.28	19	82.61
8.	Religion Hindu Muslim Others	22	95.65	20	86.96
		00	00	01	4.35
		01	4.35	02	8.69
9	Diet Vegetarian Non vegetarian	18	78.25	17	73.92
		05	21.75	06	26.08

Table 2: Frequencies And Percentage Distribution Of Prevalence Of Iron Deficiency Anemia Among Nursing Students.

Sr. No.	Parameter	Degree Of Iron Deficiency Anemia	Frequency (f)	Prevalence (%)
1.	Serum iron	Normal (33-193)	192	80.68
		Below Normal (<33)	46	19.32

Table 3: Frequency And Percentage Distribution Of Pretest Serum Iron Of Nursing Students With Iron Deficiency Anemia

Level Of Parameter	Experiment AI Group				Control Group			
	Below Normal	Normal	Above Normal	Total (%)	Below Normal	Normal	Above Normal	Total (%)
Sr. Iron	5 (21.73 %)	18 (78.27 %)	-	100	7 (30.43 %)	16 (69.57 %)	-	100

Table 4: Frequency And Percentage Distribution Of Post Test Sr. Iron Of Nursing Students With Iron Deficiency Anemia.

Level Of Parameter	Experimental Group			CONTROL GROUP		
	Below Normal	Normal	Above Normal	Below Normal	Normal	Above Normal
Sr. Iron	3 (13.04%)	20 (86.96%)	-	5 (21.74%)	18 (78.26%)	-

Table 5: Mean, Mean Difference, SD And Unpaired “t” Test Of Posttest Of Control And Experimental Group For Serum Iron Among Nursing Students With Iron Deficiency Anemia

Clinical Parameter	Experimental Post Test		Control Post Test		Mean Difference	“T” Value	P-Value
	Mean	SD	Mean	SD			
Serum iron	69.69	34.40	65.39	33.09	4.30	0.42	0.6720

Table 6: Association Between Serum Iron And Demographic Variables Among Control And Experimental Group

EXPERIMENTAL GROUP					CONTROL GROUP					
Demographic Variable	≤median		>median	Df	p-value	≤median		>median	χ ² (df)	p-value
	F	%	f	%		F	%	F	%	
1. Age(in years)									12.492	0.0004
18-19	2	8.69	2	8.69	10.95	0	0	3	13.04	
20-22	6	26.08	6	26.08		9	39.13	6	26.08	
22-24	2	8.69	3	13.08		3	13.06	2	8.69	
24-26	2	8.69	0	0	0	0	0	0	0	
					0					
2. Diet					0					
Veg	8	34.78	9	39.14	0	10	43.48	8	34.79	
Non-Veg	5	21.73	1	4.35	0	2	8.69	3	13.04	
					9					
3. Income										
5001-10,000	1	4.35	0	0		0	0	0	0	
10,001-15,000	0	0	1	4.35		3	13.04	2	8.69	
>15,000	1	52.17	9	39.13		9	39.14	9	39.13	
					2					
4. Type of Family										
Joint	4	17.39	4	17.3		2	8.69	2	8.69	
Nuclear	8	34.88	7	30.46		10	43.49	9	39.13	

5. Religion													
Hindu	10	43.48	10	43.48			12	52.18	10	43.47			
Muslim	1	4.35	0	0			0	0	0	0			
Others	1	4.35	1	4.35			0	0	1	4.35			
6. Attained Menarche													
Yes	12	52.17	11	47.83			13	56.53	10	43.47			
7. Class													
2 nd Semester	6	26.08	4	17.39			0	0	0	0			
4 th Semester	2	8.69	3	13.06			6	26.08	3	13.06			
6 th Semester	0	0	0	0			6	26.08	8	34.78			
4 th Year	4	17.39	4	17.39			0	0	0	0			
7. Age at menarche													
12	2	8.69	2	8.69			3	13.06	0	0			
13	3	13.04	6	26.08			5	21.74	4	17.39			
14	5	21.77	2	8.69			4	17.39	6	26.08			
15	2	8.69	1	4.35			0	0	1	4.34			
8. Menstrual regulatory													
Irregular	11	47.83	10	43.47			10	43.47	7	30.45			
	1	4.35	1	4.35			2	8.69	4	17.39			

CONCLUSION:

The following findings can be concluded from the present study:

The level of serum iron among nursing students who received beetroot juice was significantly improved than those who did not received beetroot juice.

The beetroot juice has significant effect on increasing the serum iron levels of iron deficiency anemia among nursing students.

Thus, it can be concluded that beetroot juice can be used to improving the serum iron of iron deficiency anemia.

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