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A study to assess the Effectiveness of Structured Teaching Program on knowledge regarding Iron Deficiency Anemia among Adolescent girls of Swami Dayananda Saraswati Inter College at Ayodhya, Uttar Pradesh

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Abstract: ***Introduction-Iron is an important micronutrient which is Very Important for various functions in human body. It is essential for cellular growth and differentiation, oxygen binding, transport and storage, enzymatic reactions, immune function, cognitive function, mental and physical growth etc. So, deficiency of iron due to either physiological or pathological reason can affect mental and physical growth resulting in decreased learning capacity and work productivity. Iron Deficiency Anemia is characterized by a defect in haemoglobin synthesis, resulting in hypochromic and microcytic red blood cells. Iron deficiency can result either due to less nutritional supply, increased demand or blood loss due to any reason. Anemia is a serious global public health problem that particularly affects young children, Adolescent and pregnant women. Although IDA occurs at all ages and involves both sexes, adolescent girls are more prone to it. The World Health Organization (WHO) defined adolescents as the population of 10-19 years of age.***

About three fourth of adolescent females do not meet the dietary requirements. Majority of the adolescents think that they are in good health and show little concern for protecting their health. The main nutritional problems of adolescents are micronutrient deficiencies like iron deficiency, folate and vit.A. According to a study by WHO on anaemia during 1993-2005, the worldwide prevalence of anaemia was 25%.

According to WHO guidelines for the control of IDA, nutritional anaemia is a major public health problem in India and is primarily due to iron deficiency. The National Family Health Survey-3 (NFHS-5,19-2021) data suggests that the prevalence of anaemia in adolescent girls (15-19 years) is 59.1%. According to the National Nutrition Monitoring Bureau Survey (NNMBS) 2006, the prevalence of anaemia in adolescent girls (12-14 years) is 68.6% whereas in (15-17 years) it is 69.7%. Aim-The main aim of the study to assess the Effectiveness of Structured Teaching Program on knowledge regarding Iron Deficiency Anemia among Adolescent girls with main objectives to assess the effectiveness of Structure Teaching Program on Iron deficiency anemia among Adolescent Girls by comparing with Pre-test and Post-test score. Methods- A quantitative research approach was adopted for the study.

The research design selected for the study was pre-Experimental with one group pre-test and post-test design. The population for the study consists of Adolescent girls to a total number of 100. Result- Mean post-test knowledge score of adolescent girls was higher than mean pre-test knowledge score i.e., 25.54 and 12.2 respectively with the mean difference of 13.34. The obtained mean difference was found to be statistically significant as evident from the 't' value of 13.92 at 0.05 level of significance which is greater than the table value. It can be inferred that structured teaching program was effective method of administering knowledge to adolescent girls with the help of Information Booklet (Annexure No.: - 17) in the form of structured teaching program. Thus, H_1 is accepted. Conclusion- Sample did not have excellent knowledge regarding Iron deficiency anemia. After administrating the structured teaching program knowledge level was improved as evidence by mean post-test score which was higher than the pre-test score. Hence, it was concluded structured teaching program was effective in improving knowledge regarding Iron deficiency anemia among adolescent girls.

Keywords: Effectiveness, Structured teaching program, Knowledge, Iron Deficiency Anemia, Adolescent Girls.

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I. INTRODUCTION

Iron is an important micronutrient which is Very Important for various functions in the human body. It is essential for cellular growth and differentiation, oxygen binding, transport and storage, enzymatic reactions, immune function, cognitive function, mental and physical growth etc. So, iron deficiency due to physiological or pathological reasons can affect mental and physical growth, resulting in decreased learning capacity and work productivity. Iron Deficiency Anemia is characterized by a defect in haemoglobin synthesis, resulting in hypochromic and microcytic red blood cells. Iron deficiency can result either due to less nutritional supply, increased demand or blood loss due to any reason. There are many reasons for iron deficiency and Iron Deficiency Anemia in adolescent girls. These may be deficient intake or absorption of iron, increased demand during adolescence, heavy blood loss during menstruation, parasitic infestation etc. More than half of the world's undernourished population lives in India. Although Iron Deficiency Anemia occurs at all ages and involves both sexes, adolescent girls are more prone to it. The World Health Organization (WHO) defined adolescents as the population of 10-19 years of age. About three fourth of adolescent females do not meet the dietary requirements.

II. NEED OF THE STUDY

Anemia is a serious global public health problem that particularly affects young children, Adolescent and pregnant women. Although IDA occurs at all ages and involves both sexes, adolescent girls are more prone to it. The World Health Organization (WHO) defined adolescents as the population of 10-19 years of age. About three fourth of adolescent females do not meet the dietary requirements.

Majority of the adolescents think that they are in good health and show little concern for protecting their health. The main nutritional problems of adolescents are micronutrient deficiencies like iron deficiency, folate and vit.A. According to a study by WHO on anaemia during 1993-2005, the worldwide prevalence of anaemia was 25%. According to WHO guidelines for the control of IDA, nutritional anaemia is a major public health problem in India and is primarily due to iron deficiency. The National Family Health Survey-3 (NFHS-5,19-2021) data suggests that the prevalence of anaemia in adolescent girls (15-19 years) is 59.1%. According to the National Nutrition Monitoring Bureau Survey (NNMBS) 2006, the prevalence of anaemia in adolescent girls (12-14 years) is 68.6% whereas in (15-17 years) it is 69.7%.

Anaemia is caused by an inadequate supply of dietary iron is the most prevalent nutritional disorder in the United States and the most common mineral disturbance. Almost 32% of lower-income Adults are anaemic. Anemia is generally recognized as the greatest nutritional problems among adolescents and diet is likely a major factor. Iron deficiency is a preventable cause. The high prevalence of anaemia (Haemoglobin <12 gm%) among adolescent girls in India, causes 1.8% loss of GDP. The daily requirement of iron for the adolescent girl is 0.8 mg/1000 Kcal of dietary energy. In the 12th five-year plan Indian government has set a goal to reduce the load of anaemia in girls and women by 50%. Awareness to adolescence is a matter of fact to be considered due to their negligence.

To have healthy women and mothers, one needs to be strong and healthy. The health education given to them will give them the insight to practice healthy lifestyles and thereby prevent anemia. Iron deficiency anemia is one of the commonest forms of anemia and is highly prevalent among the reproductive age group of women, as a result of excessive loss of iron or demand of iron associated with menstruation and childbirth. It is a critical health concern as it affects growth, and energy levels and also leads to various health problems. It is one of the main causes of morbidity and mortality in reproductive. Anemia continues to be a major public health problem in developing countries including India. It is the most common cause of malnutrition in the world and is the eighth leading cause of diseases in girls and women in developing counties WHO (2010).

A. Problem Statement

"A study to assess the Effectiveness of Structured Teaching Program on knowledge regarding Iron Deficiency Anemia among Adolescent girls of Swami Dayananda Saraswati Inter College at Ayodhya, Uttar Pradesh"

III. OBJECTIVES OF THE STUDY

1) To assess the Pre-test level of Knowledge regarding Iron deficiency anemia among the Adolescent Girls.
2) To Assess the Post-Test level of Knowledge regarding Iron deficiency anemia among the Adolescent Girls.
3) To evaluate the effectiveness of Structure Teaching Program on Iron deficiency anemia among Adolescent Girls by comparing with Pre-test and Post-test score.

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A. Hypotheses

1) *H0:* There will be no significant relationship between the Pre-test level of Knowledge Score and Post-test level of knowledge score regarding Iron Deficiency Anemia among adolescent girls of Swami Dayananda Saraswati Inter College at Ayodhya, Uttar Pradesh.
2) *H1:* There will be a significant relationship between the Pre-test level of Knowledge Score and Post-test level of knowledge score regarding Iron Deficiency Anemia among adolescent girls of Swami Dayananda Saraswati Inter College at Ayodhya, Uttar Pradesh.

B. Assumptions

1) The Girls of Adolescent age group may not have adequate knowledge regarding Iron deficiency anemia.
2) Structured teaching program on Iron deficiency anemia will improve knowledge among Adolescent Girls.

C. Delimitation

The Study is Limited to:

1) The study period of the one Month.
2) The study is limited to Adolescent Girls.

IV. CONCEPTUAL FRAME WORK

The conceptual framework for this study is based on General System Theory, introduced by Ludwig Von Bertalanffy (1968), and explained by Putt (1978).According to this theory "A system is a set of objects or elements in interaction to achieve a common goal. The function of any system is to convert or process energy, information or materials into a product or outcome for use within the system, or outside of the system (the environment) or both. In all systems activity can be resolved into an aggregation of feedback circuits such as input, throughput, and output.

Input consists of the energy and raw material transformed by the system, for example information, money, energy, time, individual effort, and raw material of some kind. In this study input refers to the adolescent girls who have different background factors and previous knowledge related to the topic.

Throughput is the process used by the system to convert raw materials or energy from the environment into products that are usable by either the system or the environment, for example, thinking, planning, constructing, and sharing information. In this study it refers to the administration of planned teaching programme for adolescent girls on improving knowledge regarding iron deficiency anemia, and the following process was adopted.

1) Preparation of the blueprint of the tool.
2) Pretesting the knowledge questionnaire regarding iron deficiency anemia.
3) Preparation and validation of STP.
4) Administration of STP regarding iron deficiency anemia to the adolescent girls.
5) Post-test to assess the knowledge regarding iron deficiency anemia by using the same tool.

Output is the product or service which results from the systems throughput or processing of human technical, social, or financial input, for example documents and decisions. In this study it refers to the gain in scores. It is evaluated through a comparison between pre-test and post-test score of the subjects.

Feedback after the administration of structured teaching program and collecting information from sample that is good or poor that depends on the knowledge on sample. Thus, it is the feedback of sample.

V. RESEARCH METHODOLOGY

A. Research Approach

In this study, Quantitative research approach is considered appropriate.

1) Research Design

In this study, Pre experimental Research one group pre-test post-test design is adopted to assess the effectiveness regarding the knowledge of Structural Teaching Program on Iron deficiency anemia among adolescent girls in selected higher secondary schools at ayodhya up.

The diagrammatic representation of this design is as follows,

Group	Pre-test	Intervention	Post-test
Experimental Group	Q1	X	Q2

B. Setting Of the Study

In the present study Setting of the study is Swami Dayanand Saraswati Inter College Ayodhya, Uttar Pradesh.

C. Variables

1) *Independent Variable:* In the Present study, Structured teaching programme on Iron Deficiency Anemia is an independent variable.
2) *Dependent Variable:* In the present study Knowledge among the adolescent girls on Iron Deficiency Anemia is a dependent variable.

D. Population

In the present study, population comprised of Adolescent Girls of Swami Dayanand Saraswati Inter College Ayodhya, Uttar Pradesh.

1) *Target Population:* In the present study, target population comprised of Adolescent Girls of Swami Dayanand Saraswati Inter College Ayodhya, Uttar Pradesh.
2) *Accessible Population:* In the present study, accessible population comprised of Adolescent Girls (13–19-year-old) of Swami Dayanand Saraswati Inter College Ayodhya, Uttar Pradesh.

E. Sample

In this study, the sample consists of Adolescent Girls (13–19-year-old) of Swami Dayanand Saraswati Inter College Ayodhya, Uttar Pradesh and who fulfilled the inclusion criteria

1) *Sample Size:* In this study, the sample comprised of 100 of Adolescent Girls who are between the age group of 13- 19 years & Studied in the selected college.
2) *Sampling Technique:* In this study, Simple random sampling technique is selected for samples collection.

VI. CRITERIA FOR SAMPLE SELECTION

A. Inclusion Criteria

The study includes:

1) Adolescent girl who are between the age group of 13- 19 years.
2) Adolescent girl who are willing to participate in the study.
3) Adolescent girl who can understand Hindi or English.
4) Those who are studying in 10^{th},11^{th} and 12^{th} standard.

B. Exclusion Criteria

The study excludes:

1) Adolescent girl who are not willing to participate in the study.
2) Adolescent girl those who were not available at the time of data collection.

VII. DATA COLLECTION TOOL AND TECHNIQUE

The tool used for the study was demographic variables and Self structured knowledge questionnaire based on the objectives of the study and with the guidance of experts in the medical field.

1) *Section A:* Demographic variables: It consists of demographic variables such as Age, Religions, Educational Status of the Parents, Occupation of the Parents, Type of Diet, Type of Family, Family Income and Previous Knowledge on Anemia.
2) *Section B:* Self Structured knowledge questionnaire: It consists of 30 Iron deficiency anaemia related questions including causes, symptoms, diagnosis, treatment, management of anemia. Each question has 4 options in which one is correct answer which is scored 1 and maximum score is 30.

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A. Scoring Interpretation

1) 1 - 10 – Poor
2) 11 - 20 – Good
3) 21 - 30 - Excellent

B. Content validity of the tool

In this study content validity was used, for the calculation of validity of tools. The tools with request letter, rating scale was submitted to the nine experts from the field of public health and medical department along with the scoring sheet for validation. There were few corrections which were made and incorporated.

C. Reliability

In order to assess the reliability of the tool, it was administered to 10 Adolescent girls' students from 10^{th},11^{th} and 12^{th} standard other than the main study sample, for pilot study. The Karl Pearson correlation coefficient was done. The subject was selected by convenience sampling. Ten adolescent girls' student were tested by using questionnaire. Correlation coefficient was found r = 0.78. On, 11^{th} July 2022 the tool was found highly reliable

D. Pilot Study

The main aim of the pilot study was to find out the practicability, feasibility, and reliability of the study. The pilot study was conducted at Pt. Parmeshwar Mishra Unique Inter College Ayodhya, Uttar Pradesh. For a period of 4 days from 05th July 2022 to 08th July 2022. Permission was obtained from the principal of respected institute (Annexure No.: 3). A pre-experimental design was adapted to assess the Effectiveness of Structured Teaching Program on knowledge regarding Iron Deficiency Anemia among Adolescent girls of Swami Dayananda Saraswati Inter College at Ayodhya, Uttar Pradesh. The pilot study was conducted with 10 students. Students who met the eligible criteria were selected by convenience sampling technique. On the first day (05th July 2022) pre-test was conducted using self-structured knowledge questionnaire. On the same day structured teaching program was administered to experimental group.

On 4th day (08th July 2022) post-test was conducted with same tool. The purpose of the study was explained, and written consent was obtained from each student. Study was assessed using questionnaire method. The duration of data collection for each participant was 15 minutes. No problem was faced during pilot study.

E. Final data collection procedure

Data collection is the process of selecting subjects and gathering data from the subjects. Prior to the data collection, permission was obtained by the concerned authorities of Swami Dayananda Saraswati Inter College at Ayodhya, Uttar Pradesh, for conducting the study and introduced ourselves to the participants. The study was conducted in the month of August 2022. The objectives of the study were explained.

Written informed consent was taken from the participants. Self-Structured knowledge questionnaire were administered to collect the data. The average time taken by the students to fill the questionnaire was 15-20 minutes. Subject was selected according to the selection criteria of the study.

1) *On Day 1 (04th August 2022):* Pre-test knowledge was assessed by using self-structured knowledge questionnaire.
2) *On Day 2 (05th August 2022):* Structured teaching program on Iron deficiency anemia was given to the Adolescents girls students in 3 Batches.
3) *On Day 7 (10th August 2022):* Post-test with the same self-structured knowledge questionnaire was done to evaluate the effectiveness of the structured teaching program to improve the knowledge level.

F. Ethical Consideration

Ethical approval was obtained from HOD of Public Health department, Dr. Ram Manohar Lohia Avadh University Ayodhya, Uttar Pradesh for conducting research study.

1) *Written* informed consent form was prepared for the study subjects regarding their willingness to participate in the research project and the purpose for carrying out research project was explained to the Members.
2) Confidentiality of the collected data is ensured.

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VIII. ORGANIZATION AND PRESENTATION OF DATA

The findings are presented according to the objectives set for the study. The data are organized under the following headings.

1) *Section I:* Demographic characteristics of adolescent girls.
2) *Section II:* Findings related to percentage of pre-test knowledge score.
3) *Section III:* Findings related to percentage of post-test knowledge score.
4) *Section IV:* Findings related to mean of pre-test and post-test knowledge score.

a) *Section I*

Demographic characteristics of Adolescent girls

Table 2: Findings related to frequency and percentage distribution among Adolescent girls in terms of demographic characteristics. (N=100)

S. No.	Demographic Variables	Frequency	Percentage
1	Age		
	a) 13-15 Years	46	46
	b) 16-19 Years	54	54
2	Religion		
	a) Hindu	93	93
	b) Muslim	4	4
	c) Sikh	1	1
	d) Christian	1	1
3	Education Status of the parents		
	a) Illiterate	22	22
	b) Primary Education	45	45
	c) Higher Secondary	28	28
	d) Under Graduate	4	4
4	Occupation of the Parents		
	a) Farming	66	66
	b) Private Servant (Please Specify)	23	23
	c) Government Servant	7	7
	d) Nil	3	3
5	Type of Diet		
	a) Vegetarian	82	82
	b) Non-Vegetarian	17	17
6	Type of family		
	a) Nuclear	57	57
	b) Joint	42	42
7	Monthly Family income		
	a) < Rs5000	32	32
	b) Rs 5001-Rs 10000	31	31
	c) Rs10001-Rs 15000	24	24
	d) >Rs 15001	12	12
8	Previous knowledge on anemia		
	a) Yes (If Yes Select the Source of Information)	81	81
	• Friends	18	18
	• Family members	24	24
	• Internet	31	31
	• Other	9	9
	b) No	17	17

- The data presented in data Table-2 depicts that majority of adolescent girls (54%) were in the age group of 16-19 years, others (46%) were in the age group of 13-25 years.
- Majority of the students (93%) were Hindu, 4% were Muslims, 1 % Sikh and other 1 % were Christian.
- In the educational status of the parents 22% belong to illiterate, 45 % belong to primary education, 28% belongs to higher secondary and 4 % were belong to Under graduate.
- 66% Adolescent girls' father had the occupation in agriculture background, 23% students' father were in private sector, 7% students' father in government sector and 3% of students father have no Occupation.
- Majority of the students 82% were consuming vegetarian diet and other 17% were consuming non vegetarian.
- 57% Adolescent girls were belonging to nuclear family and 42% were belongs to joint family.
- 32% of student's had monthly family income below 5000, 31% of students had monthly family income in bet-ween 5001-10000, 24% in between 10001-15000 and 12% had more than 15001 monthly family income as.
- Majority (83%) of students were having previous knowledge on anemia and 17% students were not have previous knowledge on Anemia.

b) Section II

Findings related to percentage of pre-test knowledge score

Table No. 3: Frequency and percentage distribution of pre-test knowledge score among Adolescent Girls.
(N=100)

Level of Knowledge score	Score Range	Frequency	Percentage
Poor	0-10	25	25%
Good	11-20	75	75%
Excellent	21-30	0	0

Table number 3 shows that the majority of students were having a good level of knowledge (75%), and other students were having poor level of knowledge 25%.

c) Section III

Findings related to the percentage of Post-test knowledge score

Table No. 4: Frequency and percentage distribution of Post-test knowledge score among Adolescent Girls.
(N=100)

Level of Knowledge score	Score Range	Frequency	Percentage
Poor	0-10	0	0 %
Good	11-20	5	5%
Excellent	21-30	95	95 %

Table number 4 shows that the majority of students were having Excellent level of knowledge (95%), other students were having a good level of knowledge 5%.

d) Section IV

Findings related to mean difference of pre-test and post-test knowledge score

Table no. 5: T-test value showing mean of pre-test and the post-test score of knowledge among Adolescent Girls.
(N=100)

Knowledge Score	Total Score	Mean	Mean Deference	Standard Division	T-test
Pre-test	1220	12.2	13.34	2.787	13.92
Post-test	2554	25.54		3.112	

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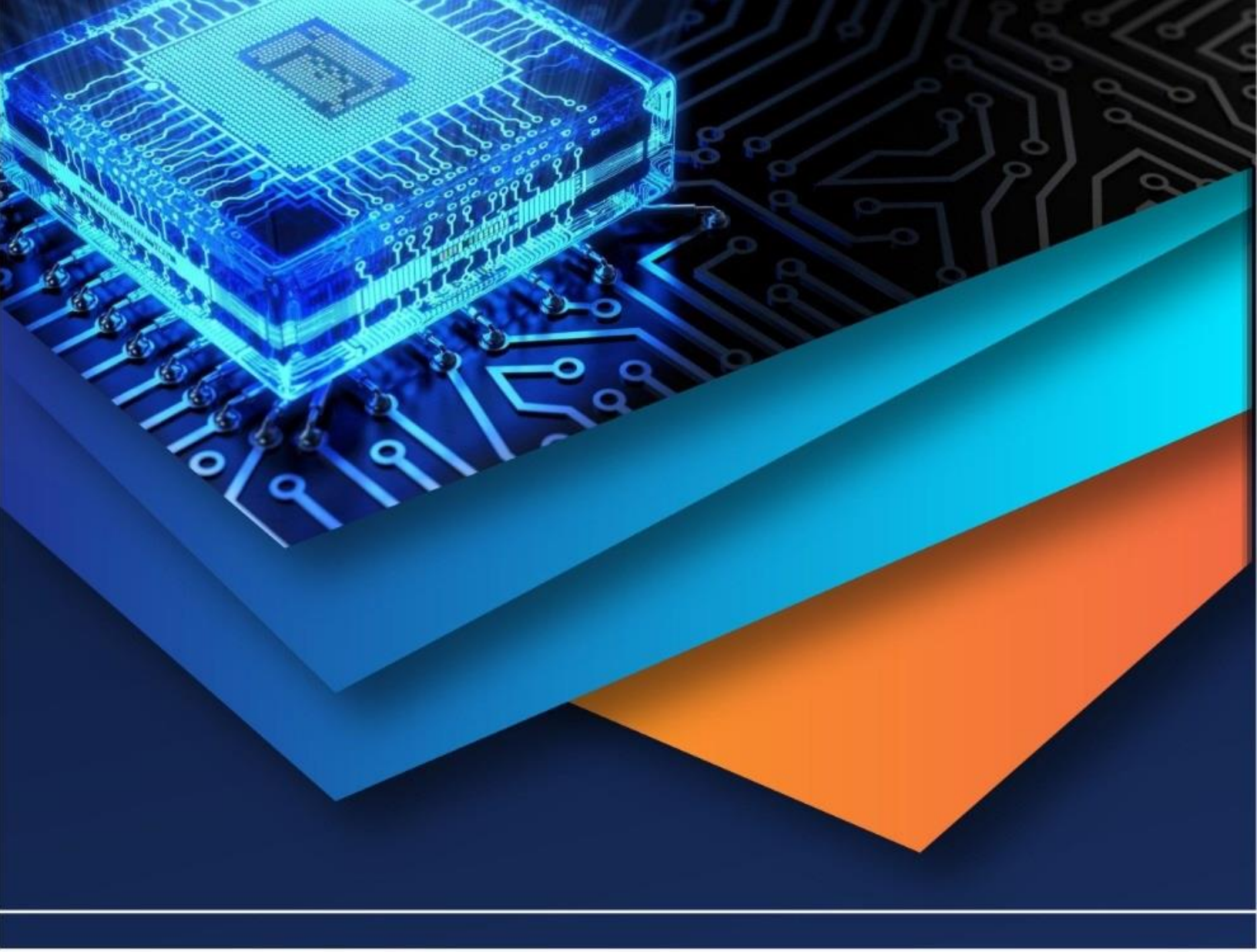
IX. RESULT

The mean post-test knowledge score of adolescent girls was higher than the mean pre-test knowledge score i.e., 25.54 and 12.2 respectively with a difference of 13.34. The obtained mean difference was found to be statistically significant as evident from the 't' value of 13.92 at 0.05 level of significance which is greater than the table value. It can be inferred that a structured teaching program was an effective method of administering knowledge to adolescent girls with the help of the Information Booklet in the form of a structured teaching program. Thus, H_1 is accepted.

X. CONCLUSION

After the detailed analysis of this study, it leads to the following conclusion:
Sample did not have excellent knowledge regarding Iron deficiency anemia. There was a significant increase in the knowledge of sample after implementation of structured teaching program. To find the effectiveness of structured teaching program, t-test was applied and was calculated. Post-test scores were found significantly higher than the pre-test score. Mean post-test score was significantly higher than mean pre-test score. Thus, it was concluded that structured teaching program was found effective on knowledge of sample regarding Iron Deficiency anemia. After administrating the structured teaching program knowledge level was improved as evidence by mean post-test score which was higher than the pre-test score. Hence, it was concluded structured teaching program was effective in improving knowledge regarding Iron deficiency anemia among adolescent girls.

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