



Effectiveness of Structured Nutritional Counselling on Knowledge, Dietary Practices, and Hemoglobin Levels among Adolescent Girls in Selected Schools of Punjab: A Randomized Controlled Study

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ABSTRACT

Background

Adolescence is a critical stage of growth and development characterized by rapid physical, psychological, and emotional changes. Nutritional deficiencies, particularly iron deficiency anemia, are highly prevalent among adolescent girls due to inadequate dietary intake, poor eating habits, menstrual blood loss, and lack of nutritional awareness. Structured nutritional counselling plays an important role in improving nutritional knowledge, healthy dietary practices, and hemoglobin levels among adolescent girls.

Objectives

1. To assess the pre-test and post-test knowledge regarding nutrition among adolescent girls.
2. To evaluate the effectiveness of structured nutritional counselling on dietary practices among adolescent girls.
3. To assess the effectiveness of structured nutritional counselling on hemoglobin levels among adolescent girls.
4. To compare the outcomes between experimental and control groups.
5. To determine the association between selected demographic variables and post-test scores.

Methodology

A randomized controlled study design was adopted for the study. The study was conducted in selected schools of Punjab among 100 adolescent girls aged 13–18 years. Simple random sampling technique was used to select the participants. The samples were equally divided into experimental group (n=50) and control group (n=50). Structured nutritional counselling was administered to the experimental group for

four weeks. Data were collected using a structured knowledge questionnaire, dietary practice checklist, and hemoglobin assessment method. Statistical analysis included descriptive and inferential statistics such as mean, standard deviation, paired t-test, and chi-square test.

Results

The study findings revealed that the mean post-test knowledge score of the experimental group significantly increased from 11.42 ± 3.18 to 24.86 ± 2.41 , whereas only minimal improvement was observed in the control group. Dietary practice scores improved significantly in the experimental group after intervention. The mean hemoglobin level increased from 9.8 ± 1.2 g/dl to 11.6 ± 1.1 g/dl among participants in the experimental group. The calculated paired t-value was statistically significant at $p < 0.05$.

Conclusion

The study concluded that structured nutritional counselling was highly effective in improving knowledge, dietary practices, and hemoglobin levels among adolescent girls. Nutritional counselling programs should be incorporated in school health services to reduce nutritional deficiencies and anemia among adolescents.

Keywords

Structured Nutritional Counselling, Adolescent Girls, Hemoglobin Level, Dietary Practices, Knowledge, Randomized Controlled Study.

INTRODUCTION

Adolescence is one of the most important phases of life marked by rapid growth and development. Proper nutrition during adolescence is essential for maintaining physical growth, reproductive health, cognitive development, and overall well-being. Adolescent girls are particularly vulnerable to malnutrition and iron deficiency anemia because of increased nutritional demands, menstrual blood loss, unhealthy dietary habits, and lack of nutritional awareness.

Globally, anemia among adolescent girls remains a major public health problem. According to the World Health Organization, nearly one-third of adolescent girls suffer from anemia, especially in developing countries. In India, nutritional deficiencies among adolescent girls are highly prevalent due to socio-economic factors, cultural practices, poor dietary intake, and inadequate health education.

Structured nutritional counselling is an educational intervention aimed at improving awareness regarding balanced diet, iron-rich foods, healthy eating habits, and prevention of nutritional deficiencies. Counselling interventions can significantly improve dietary behavior and increase hemoglobin levels among adolescent girls.

School-based nutritional education programs provide an effective platform for improving nutritional awareness and promoting healthy eating practices among adolescents. Therefore, the present study was undertaken to assess the effectiveness of structured nutritional counselling on knowledge, dietary practices, and hemoglobin levels among adolescent girls in selected schools of Punjab.

NEED FOR THE STUDY

Adolescent girls constitute a vulnerable group prone to nutritional deficiencies due to increased nutritional requirements during growth spurts. Poor dietary habits, frequent consumption of junk food,

meal skipping, and inadequate intake of iron-rich foods contribute to high prevalence of anemia among adolescents.

Anemia affects physical growth, cognitive performance, immunity, academic achievement, and future maternal health. Lack of awareness regarding nutrition and healthy eating practices further aggravates the problem.

School health programs focusing on nutritional counselling can improve awareness and encourage healthy dietary behaviors among adolescent girls. Early intervention through counselling can help prevent complications associated with nutritional deficiencies.

Hence, the investigator felt the need to conduct a randomized controlled study to assess the effectiveness of structured nutritional counselling on knowledge, dietary practices, and hemoglobin levels among adolescent girls.

STATEMENT OF THE PROBLEM

“A Randomized Controlled Study to Assess the Effectiveness of Structured Nutritional Counselling on Knowledge, Dietary Practices, and Hemoglobin Levels among Adolescent Girls in Selected Schools of Punjab.”

OBJECTIVES OF THE STUDY

1. To assess the existing knowledge regarding nutrition among adolescent girls in experimental and control groups.
2. To assess dietary practices among adolescent girls in experimental and control groups.
3. To assess hemoglobin levels among adolescent girls in experimental and control groups.
4. To evaluate the effectiveness of structured nutritional counselling on knowledge scores.
5. To evaluate the effectiveness of structured nutritional counselling on dietary practices.
6. To evaluate the effectiveness of structured nutritional counselling on hemoglobin levels.
7. To determine the association between post-test scores and selected demographic variables.

HYPOTHESES

H1: There will be a significant difference between pre-test and post-test knowledge scores among adolescent girls in the experimental group.

H2: There will be a significant improvement in dietary practices among adolescent girls after structured nutritional counselling.

H3: There will be a significant improvement in hemoglobin levels among adolescent girls in the experimental group.

H4: There will be a significant association between post-test scores and selected demographic variables.

MATERIALS AND METHODS

Research Approach

The present study adopted a quantitative research approach to assess the effectiveness of structured nutritional counselling on knowledge, dietary practices, and hemoglobin levels among adolescent girls. The quantitative approach was considered appropriate as it enables objective measurement, statistical analysis, and comparison of outcomes between experimental and control groups.

Research Design

A randomized controlled study design was used in the present study. This design was selected to evaluate the effectiveness of structured nutritional counselling by comparing the outcomes of the experimental group with the control group. Random allocation of participants helped in minimizing bias and improving the reliability of the findings.

Research Setting

The study was conducted in selected schools of Punjab. The schools were chosen based on feasibility, accessibility, availability of adolescent girls, and administrative permission from the concerned authorities.

Population

The target population of the study consisted of adolescent girls aged between 13–18 years studying in selected schools of Punjab.

Sample Size

The total sample size for the study was 100 adolescent girls.

- Experimental Group = 50
- Control Group = 50

Sampling Technique

Simple random sampling technique was used to select the participants for the study. Eligible adolescent girls were randomly assigned to either the experimental group or the control group to ensure equal chance of participation and reduce selection bias.

Inclusion Criteria

The study included:

- Adolescent girls aged between 13–18 years.
- Students willing to participate in the study.
- Students available during the period of data collection.
- Students able to understand and respond to the questionnaire.

Exclusion Criteria

The study excluded:

- Adolescent girls with severe medical illness or chronic disorders.
- Students already receiving nutritional therapy or supplementation programs.
- Students absent during data collection.
- Students unwilling to participate in the study.

Description of the Tool

The data collection tool consisted of four sections:

Section A: Demographic Variables

This section included items related to demographic characteristics such as:

- Age
- Educational class
- Religion
- Type of family
- Family income
- Dietary pattern
- Mother's education
- Occupation of parents
- Menstrual history

Section B: Structured Knowledge Questionnaire

A structured knowledge questionnaire was prepared by the investigator to assess knowledge regarding nutrition and anemia prevention. The questionnaire consisted of multiple-choice questions related to:

- Balanced diet
- Nutritional requirements during adolescence
- Iron deficiency anemia
- Iron-rich foods
- Healthy eating habits
- Importance of vitamins and minerals
- Prevention of nutritional deficiencies

Each correct answer was awarded one mark, and the total score was calculated to determine the level of knowledge among participants.

Section C: Dietary Practice Checklist

The dietary practice checklist assessed the dietary behaviors and eating patterns of adolescent girls. The checklist included items related to:

- Frequency of meals
- Consumption of green leafy vegetables
- Intake of fruits and milk products
- Consumption of iron-rich foods
- Water intake
- Breakfast habits
- Consumption of junk food and carbonated drinks

The responses were scored to evaluate the dietary practices of participants.

Section D: Hemoglobin Assessment

Hemoglobin levels were assessed using standard hemoglobin testing methods under appropriate supervision. The hemoglobin values were recorded in grams per deciliter (g/dl) before and after the intervention.

Intervention

Structured nutritional counselling was provided to the experimental group for a duration of four weeks. The counselling sessions were conducted using:

- Lecture method
- Charts and flashcards
- Audiovisual aids
- Demonstrations
- Interactive discussion sessions

The counselling content included:

- Importance of balanced diet
- Nutritional needs during adolescence
- Iron-rich foods
- Prevention of anemia
- Healthy eating habits
- Importance of fruits, vegetables, and proteins
- Avoidance of junk food and unhealthy dietary practices

The control group did not receive any structured nutritional counselling during the study period.

Data Collection Procedure

Formal permission was obtained from the school authorities prior to data collection. Ethical clearance was obtained from the institutional ethics committee. Written informed consent was obtained from participants and school authorities.

The data collection procedure was carried out in the following phases:

1. Selection of eligible participants based on inclusion criteria.
2. Random assignment of participants into experimental and control groups.
3. Administration of pre-test to assess baseline knowledge, dietary practices, and hemoglobin levels.
4. Implementation of structured nutritional counselling for the experimental group over four weeks.
5. No intervention was administered to the control group.
6. Post-test assessment was conducted after completion of the intervention using the same tools.

Ethical Consideration

Ethical clearance was obtained from the Institutional Ethics Committee prior to conducting the study. Permission was obtained from the principals of selected schools. Written informed consent was obtained from all participants and confidentiality of information was strictly maintained throughout the study. Participants were assured that their responses would be used only for research purposes and anonymity was maintained.

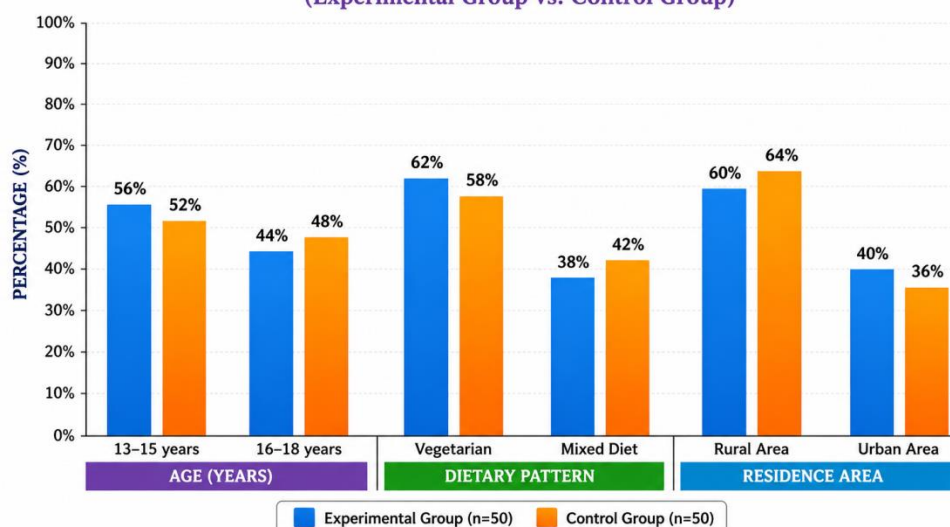
RESULTS

Table 1: Distribution of Samples According to Demographic Variables (N=100)

Demographic Variables	Experimental Group f (%)	Control Group f (%)
Age 13–15 years	28 (56%)	26 (52%)
Age 16–18 years	22 (44%)	24 (48%)
Vegetarian	31 (62%)	29 (58%)
Mixed Diet	19 (38%)	21 (42%)
Rural Area	30 (60%)	32 (64%)
Urban Area	20 (40%)	18 (36%)

DEMOGRAPHIC VARIABLES OF PARTICIPANTS

(Experimental Group vs. Control Group)



Note: The above graph shows the distribution of participants based on age, dietary pattern and residence area in both experimental and control groups.

Table 2: Comparison of Pre-test and Post-test Knowledge Scores

Group	Mean	SD	Mean Difference	t-value	Significance
Experimental Pre-test	11.42	3.18	13.44	21.36	Significant
Experimental Post-test	24.86	2.41			p<0.05
Control Pre-test	11.58	3.02	1.12	1.84	Not Significant
Control Post-test	12.70	3.10			

The above table indicates that the post-test knowledge score in the experimental group was significantly higher compared to the pre-test score.

COMPARISON OF KNOWLEDGE SCORES (MEAN VALUES)

Pre-test and Post-test in Experimental and Control Groups

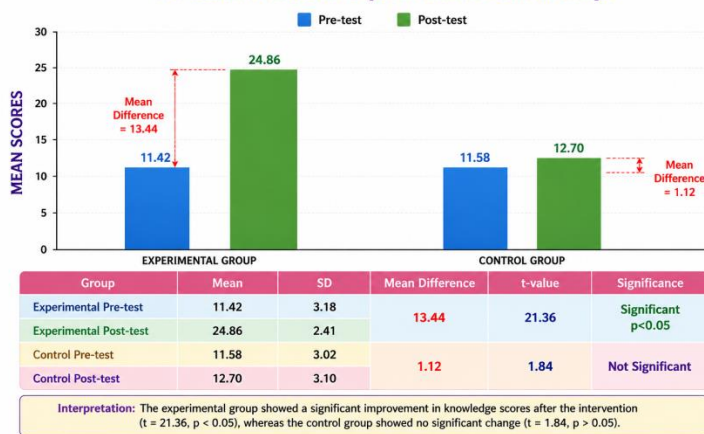


Table 3: Comparison of Dietary Practice Scores

Group	Mean	SD	Mean Difference	t-value	Significance
Experimental Pre-test	14.22	2.85	8.46	18.54	Significant p<0.05
Experimental Post-test	22.68	2.14			
Control Pre-test	14.36	2.71	0.94	1.42	Not Significant
Control Post-test	15.30	2.64			

The findings showed that dietary practices improved significantly after structured nutritional counselling.

COMPARISON OF DIETARY PRACTICE SCORES (MEAN VALUES)

Pre-test and Post-test in Experimental and Control Groups

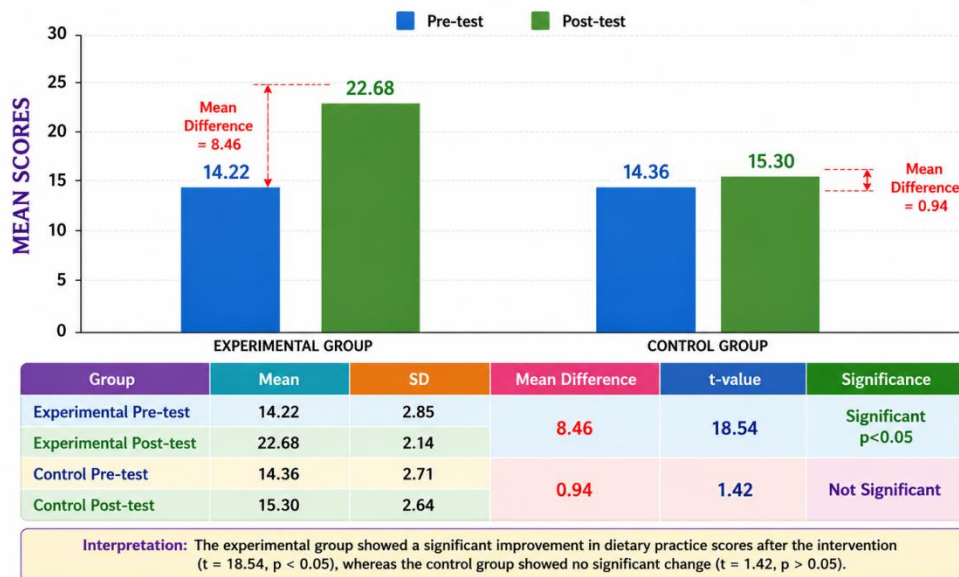
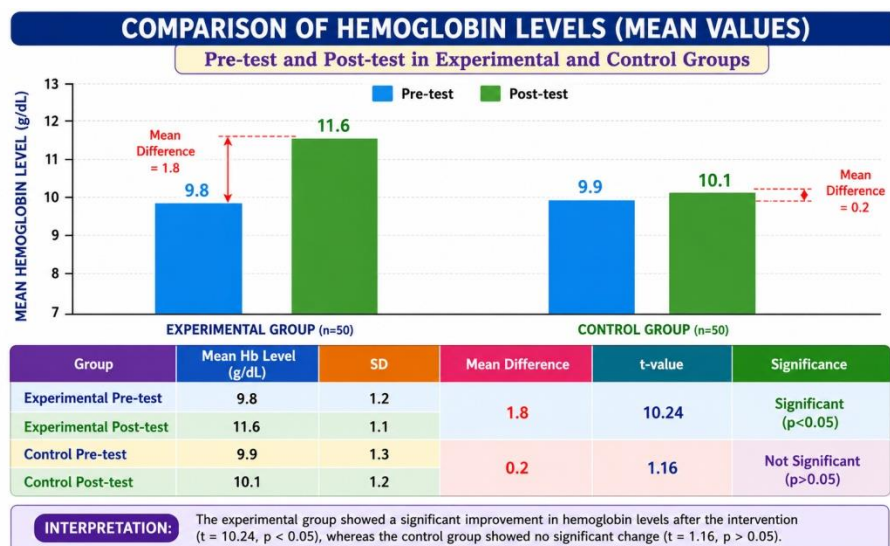


Table 4: Comparison of Hemoglobin Levels

Group	Mean Hb Level	SD	Mean Difference	t-value	Significance
Experimental Pre-test	9.8	1.2	1.8	10.24	Significant p<0.05
Experimental Post-test	11.6	1.1			
Control Pre-test	9.9	1.3	0.2	1.16	Not Significant
Control Post-test	10.1	1.2			

The above findings indicate that structured nutritional counselling significantly improved hemoglobin levels among adolescent girls.



DISCUSSION

The present study demonstrated that structured nutritional counselling significantly improved knowledge, dietary practices, and hemoglobin levels among adolescent girls. Similar findings were reported in previous studies where educational interventions improved nutritional awareness and reduced anemia prevalence among adolescents.

The increase in post-test knowledge scores indicates that counselling sessions effectively enhanced understanding regarding balanced diet, iron-rich foods, and healthy eating habits. Improvement in dietary practice scores revealed positive behavioral changes among participants.

The improvement in hemoglobin levels among the experimental group indicates that nutritional counselling encouraged consumption of iron-rich foods and healthy dietary habits. The findings support the importance of school-based nutritional education programs.

NURSING IMPLICATIONS

Nursing Practice

The findings of the present study emphasize the important role of nurses in promoting nutritional health among adolescent girls. Community health nurses, school health nurses, and pediatric nurses can organize regular nutritional counselling sessions in schools and community settings to improve awareness regarding balanced diet, anemia prevention, and healthy eating habits. Nurses can also conduct screening programs for early identification of anemia and nutritional deficiencies among adolescents. Health education activities such as demonstrations, group discussions, posters, and nutritional awareness campaigns can motivate adolescent girls to adopt healthy dietary practices and improve their hemoglobin levels.

Nursing Education

The study highlights the need to strengthen nursing education related to adolescent nutrition and anemia prevention. Nursing curriculum should include detailed content regarding nutritional assessment, dietary counselling, adolescent health problems, and preventive strategies for nutritional deficiencies. Nursing students should be trained in conducting nutritional education programs and counseling sessions in

schools and communities. Continuing nursing education programs, workshops, and seminars can further enhance nurses' knowledge and skills regarding adolescent nutritional care.

Nursing Administration

Nursing administrators should encourage implementation of regular school health programs focusing on nutrition education and anemia prevention. Adequate resources, educational materials, audiovisual aids, and training facilities should be provided for conducting nutritional counselling programs. Administrators should coordinate with schools, health departments, and community organizations to organize awareness programs and health camps for adolescent girls. Policies promoting adolescent nutritional health and regular hemoglobin screening should also be strengthened.

Nursing Research

The findings of the study provide a basis for future nursing research in the field of adolescent nutrition and health promotion. Further studies can be conducted with larger sample sizes, different settings, and longer follow-up periods to assess the long-term effectiveness of nutritional counselling programs. Comparative studies may also be conducted to evaluate different educational interventions for improving nutritional status among adolescents. Research studies focusing on rural and urban populations, socio-economic factors, and lifestyle modifications can contribute to evidence-based nursing practice.

LIMITATIONS

1. The study was limited to selected schools of Punjab.
2. The sample size was limited to 100 participants.
3. The study duration was limited.
4. Dietary practices were assessed through self-reported responses.

RECOMMENDATIONS

1. Similar studies can be conducted on a larger sample.
2. Longitudinal studies can be conducted to assess long-term effects.
3. Nutritional counselling can be integrated into school health programs.
4. Comparative studies can be conducted between urban and rural schools.

CONCLUSION

The study concluded that structured nutritional counselling was effective in improving knowledge, dietary practices, and hemoglobin levels among adolescent girls. The intervention enhanced awareness regarding balanced nutrition and encouraged healthy dietary behaviors. School-based nutritional counselling programs can play an important role in preventing anemia and improving adolescent health.

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