

Effectiveness of a Structured Teaching Programme on Nutrition and Reproductive Health Knowledge among Adolescent Girls in selected villages of Gurugram: A Pre-Experimental Study

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ABSTRACT

Background: Adolescent girls in India face a dual burden of undernutrition and poor reproductive health literacy, contributing to adverse health outcomes across the life course. Despite the implementation of national adolescent health programmes, significant knowledge gaps persist, particularly in rural areas.

Objectives: To assess the effectiveness of a structured teaching programme (STP) on improving knowledge related to nutrition and reproductive health among adolescent girls in rural Gurugram, Haryana.

Methodology: A pre-experimental one-group pretest-posttest design was employed among 124 adolescent girls aged 12–16 years, selected from two government schools in rural Gurugram. A structured questionnaire assessed knowledge on topics including balanced diet, anaemia, puberty, menstruation, and contraception. Following the pretest, participants received an interactive STP using multimedia tools, role-play, and food demonstrations. Posttest data were collected after one week and analyzed using paired t-tests and descriptive statistics.

Results: At baseline, 58.1% of girls were underweight (BMI <18.5), and 75.8% were anaemic, indicating a high burden of nutritional deficiency. Pre-intervention knowledge scores were low (mean = 11.2 ± 3.8 out of 30). One week post-intervention, the mean score increased significantly to 21.2 ± 3.1 ($p < 0.001$), with a large effect size (Cohen's $d \approx 1.27$). The intervention led to significant improvement across all topic areas.

Conclusion: The structured teaching programme was highly effective in enhancing knowledge of nutrition and reproductive health among adolescent girls. Its culturally appropriate and interactive format contributed to high engagement and substantial learning gains. Integration of such interventions into school health and community platforms like RKSK could be a cost-effective strategy for improving adolescent health outcomes in rural India.

Keywords: Adolescent girls, Nutrition education, Reproductive health, Structured teaching programme, Anaemia, Rural India, Health promotion

1. INTRODUCTION

Adolescence (10 – 19 years) is a pivotal window for establishing lifelong nutrition and reproductive-health practices, yet evidence shows that Indian girls enter adulthood burdened by malnutrition, anaemia and misinformation.

Reproductive health education remains a neglected area, often treated as a sensitive topic and omitted from school discussions. This deprives young girls of essential knowledge about menstruation, hygiene, safe sexual practices, contraception, and protection against sexually transmitted infections (STIs). Furthermore, adolescent girls from rural areas, in Haryana, are particularly vulnerable due to low socio-economic status, lack of access to health services, and limited parental awareness.

The Government of India has implemented initiatives such as the Rashtriya Kishor Swasthya Karyakram (RKSK) and POSHAN Abhiyaan to improve adolescent health outcomes, but their reach and effectiveness remain inconsistent across urban poor communities. There is a pressing need to supplement national efforts with localized, culturally sensitive, school- or community-based interventions to fill these knowledge gaps.

Need of the study

National Family Health Survey-5 (2019-21) reports that 59.1 % of Indian girls aged 15-19 are anaemic—an increase from 55.8 % in NFHS-4—with Haryana consistently higher than the national average. A 2022 community study in neighbouring Faridabad district found anaemia in 71.7 % of post-menarcheal rural girls, half of whom had moderate-to-severe anaemia. Equally concerning is the scarcity of accurate reproductive-health knowledge. Baseline data from a 2023 cluster-randomised trial in Odisha showed that barely half of Grade 9–10 girls could identify basic pubertal changes; fewer than one in five knew that a single unprotected sexual act could cause pregnancy. Knowledge improved to >90 % only after a structured education programme, highlighting a substantial pre-intervention deficit. A 2024 systematic review concurs, tagging “lack of knowledge, myths and fear” as the leading barrier to sexual and reproductive-health (SRH) awareness among rural Indian adolescents.

This study is necessary to identify knowledge gaps, provide structured educational interventions, and measure their impact. Findings from this research can guide school-based and community-led health education programs and contribute to achieving national and global adolescent health targets. Adolescence (10–19 y) is a critical window for laying lifelong nutrition and reproductive-health (RH) foundations. Yet Indian girls enter adulthood burdened by malnutrition, anaemia and misinformation. NFHS-5 reports a 59.1 % anaemia prevalence in 15–19-year-olds, highlighting a worsening trend. During adolescence, girls experience rapid physical, emotional, and cognitive development, demanding increased nutritional intake and accurate knowledge to support healthy transitions into adulthood. However, the majority lack access to scientifically accurate, age-appropriate health education due to socio-cultural taboos, gender norms, and inadequate school curricula.

2. AIM

This study aims to assess the existing knowledge levels on nutrition and reproductive health among adolescent girls, implement an interactive teaching programme tailored to their needs, and evaluate the effectiveness and retention of knowledge following the intervention.

Methodology

SYSTEMATIC REPRESENTATION OF RESEARCH METHODOLOGY



3. RESULTS AND ANALYSIS

1: Socio-demographic Data

Table-1: Frequency Distribution Of Samples showing Age & Educational level (N = 124)

Variable	n	%
Age 11–13 y	32	25.8
Age >13–15 y	58	46.7
Age >15–17 y	34	27.4

Middle school	38	30.6
Secondary	52	41.9
Senior Secondary	34	27.4

TABLE–2 : Frequency Distribution Of Samples showing Age Of Menarche_(N = 124)_

Age Of Menarche (In Years)	Frequency	Percentage
11-13	40	32.2
>13-15	43	34.6
>15-17	34	27.4

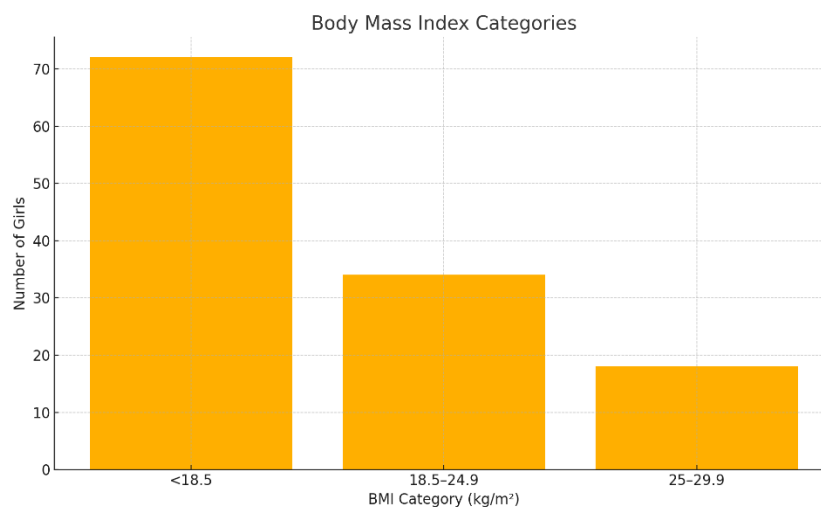
The 124 adolescent girls were predominantly early–mid adolescents (mean 14.2 y). Almost three-quarters (72.5 %) were still in middle or secondary school, and menarche had already occurred for 67 %.

2: Nutritional & Hematologic Status

Table – 3: Frequency and Percentage Distribution of Body Mass Index

Body Mass Index (kg m ⁻²)	Frequency	Percentage
<18.5	72	58.0
18.5-24.9	34	27.4
25-29.9	18	14.5

Under-nutrition was widespread: 72/124 girls (58.1 %) fell below 18.5 kg m⁻², 27.4 % were in the healthy range and 14.5 % were overweight/obese.

**Figure 1 : Bar Diagram Showing frequency Distribution of BMI of samples****Table – 4: Frequency Distribution of Samples showing Hemoglobin Level**

Hemoglobin Level (In gm %)	Frequency	Percentage
<8	5	4.0
8-9	19	15.3
9-10	35	28.2

10-11	34	27.4
11-12	21	16.9
>12	10	8.1

Only 8.1 % had Hb > 12 g dL⁻¹. Fully 75.8 % were anaemic, with 4.0 % severely (< 8 g dL⁻¹), 43.5 % moderately (8–10.9 g dL⁻¹) and 28.2 % mildly (11–11.9 g dL⁻¹) anaemic.

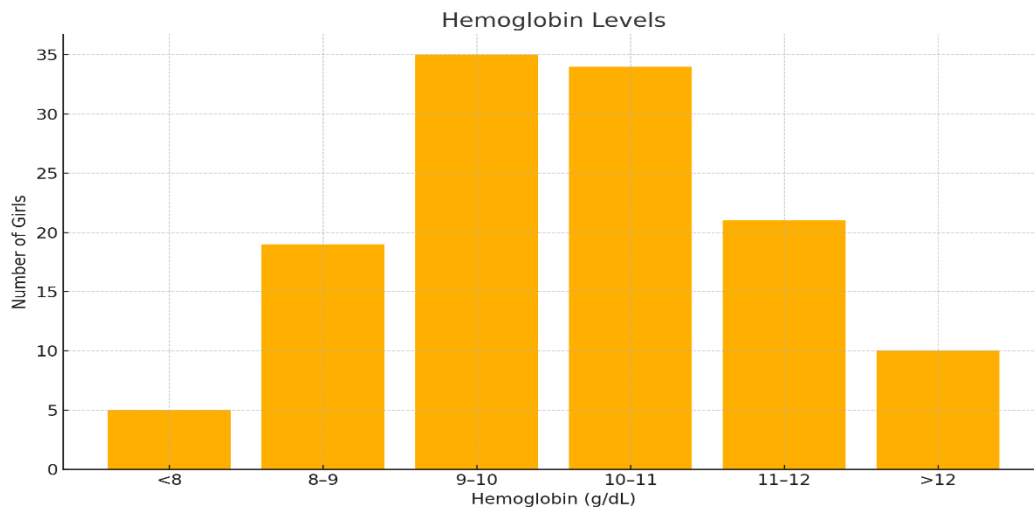


Figure 2 : Bar Diagram Showing frequency Distribution of Hemoglobin Level

3: Knowledge Outcomes

Table-5: Mean Difference of Pre-test & Post-test mean of knowledge Scores_(N = 124).

Type Of Knowledge Score	Mean	Mean Difference
Pre Test	11.2	10
Post Test	21.2	

Before the teaching programme, mean knowledge was only 11.2 ± 3.8 (out of 30). One week after the session it leapt to 21.2 ± 3.1 . The 10-point gain was highly significant (paired $t = 14.13$, $df = 123$, $p < 0.001$). The 95 % CI for the mean difference was 8.6–11.4, and the paired-samples effect size was large (Cohen $d \approx 1.27$).

4. DISCUSSION

This study reveals a high prevalence of under nutrition and anaemia among adolescent girls in rural Gurugram, alongside poor baseline knowledge of nutrition and reproductive health. A structured teaching programme significantly improved their knowledge, with a large effect size, suggesting that interactive and culturally tailored education is highly effective. The intervention outperformed similar studies and demonstrated potential for short-term knowledge retention. While the study lacked a control group and had limited follow-up, its design and delivery offer a scalable model for school and community health programmes. Further research with longer follow-up and physiological outcomes is recommended to assess sustained impact and guide policy implementation.

5. CONCLUSION

The study confirms that adolescent girls in rural Gurugram carry a dual burden of mal-nutrition and insufficient reproductive-health literacy. A single, structured teaching programme produced a **large, statistically and educationally meaningful gain in knowledge (Cohen $d > 1$)** within one week. Scaling similar, context-specific education through existing school-health and adolescent-health infrastructures is likely to be an efficient strategy to advance India's nutrition and SRH targets for adolescents.

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