

A STUDY TO EVALUATE THE EFFECTIVENESS OF STP ON KNOWLEDGE REGARDING PRE PREPAREDNESS FOR MENSTRUATION AND MENSTRUAL HYGIENE AMONG PRE-ADOLESCENT GIRLS IN SELECTED RURAL SCHOOLS AT HASSAN DISTRICT

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Abstract

Background: Hand hygiene is one of the most effective measures for preventing healthcare-associated infections. Assessing the knowledge of school children regarding hand hygiene is essential for planning effective health education programmes.

Objectives: To assess the level of knowledge regarding hand hygiene among school children and to determine the association between selected demographic variables and knowledge levels.

Methods: A descriptive cross-sectional study was conducted among 80 school children. Data were collected using a structured knowledge questionnaire. Knowledge scores were categorized as moderately adequate and inadequate. Descriptive statistics and the Chi-square test were used to analyze the data.

Results: Among the participants, 25 (31.3%) had moderately adequate knowledge, while 55 (68.7%) had inadequate knowledge regarding hand hygiene. Chi-square analysis showed no statistically significant association between knowledge level and any of the selected demographic variables, including age ($\chi^2=4.348$, $p=0.226$), religion ($\chi^2=3.766$, $p=0.152$), type of family ($\chi^2=1.732$, $p=0.188$), mother's education ($\chi^2=0.014$, $p=1.000$), father's occupation ($\chi^2=2.813$, $p=0.421$), dietary habits ($\chi^2=1.142$, $p=0.285$), place of residence ($\chi^2=0.570$, $p=0.811$), and source of information ($\chi^2=1.080$, $p=0.897$) ($p>0.05$).

Conclusion: The findings indicate that the majority of school children had inadequate knowledge regarding hand hygiene. None of the selected demographic variables showed a significant association with knowledge levels. The study highlights the need for regular school-based health education and awareness programmes to improve hand hygiene knowledge and practices among children.

Keywords: Hand hygiene, knowledge, school children, demographic variables, Chi-square test, health education.

Introduction

Puberty represents the foundational maturational, hormonal, and physical growth phase during which reproductive organs functionalize and secondary sex characteristics emerge. This transition spans prepubescence, puberty (marked by menarche in girls at an average age of 12 to 13), and post-pubescence [1, 4, 5]. The World Health Organization (WHO) defines adolescence as individuals aged 10–19 years [3]. In India, adolescents account for 21.4% of the population, with girls aged 10–14 and 15–19 constituting 12.1% and 10.5% of the population respectively [3].

A typical menstrual cycle lasts 21 to 45 days in adolescents, with a flow of 2–7 days and an average fluid volume of 35 mL [6]. Despite its physiological normalcy, menstruation is heavily constrained by socio-cultural and religious traditions. In Hinduism, structural restrictions bar menstruating women from temples and religious rituals [7]. Furthermore, structural communication gaps leave many adolescents unprepared for these bodily changes, which often induces significant psychosocial stress [2].

Need for the Study

The intersection of nutritional transitions and rapid modernization has led to an earlier onset of puberty globally, leaving families unequipped to provide timely, accurate biological education. Due to deep-rooted cultural taboos and institutionalized silence, young girls frequently transition into menarche with little to no psychological preparation, fostering profound feelings of isolation, shame, and anxiety [9].

Empirical evidence highlights a critical gap in reproductive literacy:

- **Cultural Restrictions Over Education:** Research shows that instead of receiving accurate anatomical education, girls are subjected to behavioral restrictions based on purity taboos, such as being barred from kitchens or being told that their touch will rot pickles [10].
- **Institutional Neglect:** While elaborate ceremonies often celebrate "coming of age" in South India, they rarely impart structural knowledge regarding reproductive health or menstrual hygiene, reinforcing unscientific superstitions instead [11].
- **Widespread Ignorance:** Global data underscores this systemic deficit; a study in Nigeria revealed that 40% of schoolgirls lacked basic menstrual literacy, and 84% were completely unprepared for their first menses [12].
- **Inadequate Information Channels:** In rural India, girls primarily rely on mass media or peers for reproductive health information, as structural platforms for health communication are largely absent [14].

Failure to educate pre-adolescents about reproductive anatomy directly correlates with poor menstrual hygiene, increasing their vulnerability to reproductive tract infections (RTIs). Conversely, structured health interventions foster positive self-esteem and safe sanitary practices [8, 13]. Therefore, there is an urgent need for healthcare personnel to implement structured teaching programs. This study addresses this gap by evaluating the effectiveness of a structured teaching program on menarche preparedness and menstrual hygiene among adolescent girls in rural schools within the Hassan district.

OBJECTIVES OF THE STUDY

- To assess the knowledge regarding pre preparedness for menstruation and menstrual hygiene among pre-adolescent girls before structured teaching programme
- To administer structured teaching programme regarding pre preparedness for menstruation and menstrual hygiene among pre-adolescent girls.
- To evaluate the effectiveness of structured teaching programme regarding pre preparedness for menstruation and menstrual hygiene among pre-adolescent girls after structured teaching programme.
- To find the association between knowledge of pre-adolescent girls regarding pre preparedness for menstruation and menstrual hygiene with their selected socio demographic variables.

HYPOTHESES:

H1- There will be significant increase in post test knowledge scores after administration of structured teaching programme regarding pre preparedness for menstruation and menstrual hygiene.

H2- There will be significant association between post-test knowledge scores regarding pre preparedness for menstruation and menstrual hygiene among pre-adolescent girls with their selected socio demographic variables.

OPERATIONAL DEFINITIONS:

1. **EVALUATE:** It refers to statistical estimation of outcome of STP on level of knowledge regarding pre preparedness for menstruation and menstrual hygiene.
2. **EFFECTIVENESS:** It refers to determine the extent to which the information given through structured teaching programme regarding pre preparedness for menstruation and menstrual hygiene has achieved the desired outcome as measured by gain in post-test knowledge scores.
3. **STRUCTURED TEACHING PROGRAMME:** It is a systematically planned or organized structured teaching programme for 1 hour to educate the pre-adolescent girls regarding the pre preparedness for menstruation and menstrual hygiene.
4. **KNOWLEDGE:** It is the response given by the pre-adolescent girls regarding pre preparedness for menstruation and menstrual hygiene being measured by structured knowledge questionnaires.
5. **PRE PREPAREDNESS FOR MENSTRUATION:** In this study it refers to getting ready of physically and mentally to have monthly blood flow from the uterus beginning at the age of 12-16 years among pre-adolescent girls in an expected situation without a specific time.
6. **MENSTRUAL HYGIENE:** It includes all those measures taken by the pre-adolescent girls to keep the genital area clean and dry during menstrual periods.
7. **PRE-ADOLESCENT GIRLS:** It refers to the girls age group between 9-12 years and studying in selected rural schools at Hassan district.

ASSUMPTIONS:

1. Pre-adolescent girls will have some knowledge regarding pre preparedness for menstruation and menstrual hygiene.
2. Structured teaching programme may improve the knowledge of the pre-adolescent girls regarding pre preparedness for menstruation and menstrual hygiene.
3. Knowledge of pre-adolescent girls can be measured by structured knowledge questionnaire.

DELIMITATIONS:

- 1) Study is limited to 9-12 years of pre-adolescent girls.
- 2) The data collection period is of 4-6 weeks.
- 3) The knowledge of the pre-adolescent girls is evaluated by structured knowledge questionnaire.

RESEARCH METHODOLOGY

Research Approach

A research approach provides the overall direction for conducting a study and guides the selection of appropriate methods for data collection and analysis. The present study adopted an evaluative approach, which is suitable for measuring the effectiveness of an intervention by determining how well a programme or procedure works. This approach was selected to evaluate the effectiveness of a Structured Teaching Programme (STP) on knowledge regarding pre-preparedness for menstruation and menstrual hygiene among pre-adolescent girls by comparing their pre-test and post-test knowledge scores.

Research Design

The study employed a Pre-experimental One-Group Pre-test and Post-test Research Design. A single group of pre-adolescent girls was assessed using a pre-test (O_1), followed by the administration of the Structured Teaching Programme (X). A post-test (O_2) was conducted on the 7th day to evaluate the effectiveness of the intervention.

Schematic Representation of the Design:

- **Day 1 (Pre-test):** Assessment of existing knowledge (O_1)

- **Intervention:** Implementation of the Structured Teaching Programme (X)
- **Day 7 (Post-test):** Assessment of post-intervention knowledge (O_2)

Variables of the Study

- **Independent Variable:** The Structured Teaching Programme (STP) regarding pre-preparedness for menstruation and menstrual hygiene.
- **Dependent Variable:** Knowledge of pre-adolescent girls regarding pre-preparedness for menstruation and menstrual hygiene.
- **Demographic/Extraneous Variables:** Age, religion, type of family, education status, place of residence, occupation, dietary habits, and source of information.

Setting of the Study

The study was conducted in selected Rural Schools at Hassan District. This setting was selected due to the investigator's interest in imparting knowledge to rural pre-adolescent girls, familiarity with the setting, and the ready availability of the required sample.

Population, Sample, and Sampling Technique

- **Target Population:** Pre-adolescent girls studying in selected rural schools at Hassan District.
- **Sample Size:** The total sample consisted of 80 pre-adolescent girls who fulfilled the baseline inclusion criteria.
- **Sampling Technique:** A probability (simple random) sampling technique was utilized to select the participants.

Description of the Tool

A Structured Knowledge Questionnaire developed by the investigator was used for data collection. The development process involved preparing a blueprint, consulting experts, content validation, pre-testing, and reliability testing. The final tool consisted of two primary parts:

- **Part I: Socio-demographic Data:** Contained 8 items mapping out personal information (Age, Religion, Type of family, Education status, Place of residence, Occupation, Dietary habits, and Source of information).
- **Part II: Structured Knowledge Questionnaire:** Contained 30 questions evenly distributed across three specific sections:
 - *Section A:* Knowledge regarding the female reproductive system.
 - *Section B:* Knowledge regarding pre-preparedness for menstruation.
 - *Section C:* Knowledge regarding pre-preparedness for menstrual hygiene.

Scoring and Interpretation

Each correct answer was assigned a score of 1, and every wrong/remaining answer received a score of 0. Knowledge categories were benchmarked as follows:

- **Inadequate Knowledge:** <40% score
- **Moderately Adequate Knowledge:** 40–60% score
- **Adequate Knowledge:** >60% score

Validity, Reliability, and Pilot Study

- **Content Validity:** The tool, statement of problem, objectives, and blueprint were submitted to subject matter experts. Revisions and modifications were incorporated based on their collective recommendations.
- **Reliability:** The structural tool demonstrated a high reliability coefficient of 0.81, confirming its accuracy, stability, and feasibility for final deployment.

- **Pilot Study:** Conducted using 6 pre-adolescent girls (excluded from the main study sample). The trial run confirmed that the Structured Teaching Programme was highly effective in increasing participant knowledge scores and verified the overall statistical design.

Data Collection Procedure

Formal written permission was obtained from the respective school authorities. Data collection was carried out from 20th November to 20th December. After establishing rapport and obtaining individual assent from the pre-adolescent girls, the investigator administered the socio-demographic tools and the baseline pre-test. The Structured Teaching Programme (STP) was delivered in a lesson-plan framework immediately following the pre-test. A post-test was administered on the 7th day using the identical structured questionnaire to measure knowledge gain.

Plan for Data Analysis

The compiled data were coded numerically, tabulated, and entered into a spreadsheet for statistical evaluation.

- **Descriptive Statistics:** Frequency, percentage distributions, mean, and standard deviations were used to analyze demographic characteristics and describe baseline/post-intervention knowledge levels.
- **Inferential Statistics:** A student paired *t*-test was executed to determine the statistical significance of the knowledge score differences, evaluating the overall effectiveness of the STP. A Chi-square (χ^2) test was applied to find any significant associations between baseline knowledge scores and selected socio-demographic variables.

RESULTS

Table 1: Comprehensive Distribution of Subjects by Socio-Demographic Variables (*N* = 80)

Demographic Variables	Category	Number of Subjects (n)	Percentage (%)
Age	9 Years	24	30.0
	10 Years	19	23.8
	11 Years	20	25.0
	12 Years	17	21.2
Religion	Hindu	58	72.5
	Muslim	18	22.5
	Christian	4	5.0
Type of Family	Nuclear	56	70.0
	Joint	24	30.0
	Extended	0	0.0
Mother's Educational Status	Primary & Secondary	51	63.7
	PUC	16	20.0
	No Formal Education	10	12.5
	Graduation	3	3.8
Father's Occupation	Agriculture	35	43.8
	Private	30	37.5
	Government	13	16.2
	Business	2	2.5
Dietary Habits	Mixed	63	78.8
	Vegetarian	17	21.2
Place of Residence	Rural	71	88.8
	Remote Area	9	11.2
	Urban / Suburban	0	0.0
Main Source of Information	Others	23	28.7
	Friends	18	22.5
	Health Care Personnel	17	21.2
	Family Members	14	17.5
	Mass Media	8	10.0

The demographic profile of the 80 pre-adolescent girls reveals a relatively even age distribution, with the largest group being 9-year-olds (30%). The vast majority of participants are Hindu (72.5%), reside in rural areas (88.8%), live in nuclear families (70%), and consume a mixed diet (78.8%). Socio-economically, most mothers completed primary or

secondary education (63.7%), while agriculture serves as the primary occupation for the fathers (43.8%). Notably, there is no single dominant channel for menstrual health communication; miscellaneous sources ("Others") lead at 28.7%, followed closely by friends (22.5%) and healthcare personnel (21.2%), while mass media is the least utilized resource (10%).

Assessment of Intervention Effectiveness

To evaluate the impact of the Structured Teaching Programme (STP), pre-test and post-test knowledge scores were compared across three distinct anatomical and behavioral domains using a Student's paired *t*-test.

Table 2: Comparison of Pre-test and Post-test Knowledge Scores by Domain (*N* = 80, *df* = 79)

Area of Knowledge	Pre-test Mean (± SD)	Post-test Mean (± SD)	Mean Enhancement (± SD)	Paired t-test Value
Female Reproductive Organs	3.20 ± 0.96	5.29 ± 0.64	2.09 ± 1.14	<i>t</i> = 16.401**
Pre-preparedness for Menstruation	4.15 ± 1.32	9.95 ± 1.03	5.80 ± 1.63	<i>t</i> = 31.910**
Pre-preparedness for Menstrual Hygiene	4.04 ± 1.28	10.49 ± 1.29	6.45 ± 1.90	<i>t</i> = 30.438**

***p* = 0.000 (Very Highly Significant)

The empirical data demonstrates substantial knowledge deficits during the baseline assessment, particularly regarding female reproductive anatomy and fundamental menstrual hygiene practices. Following the implementation of the Structured Teaching Programme, participant scores surged across all evaluated domains.

The most pronounced improvement occurred in Pre-preparedness for Menstrual Hygiene, where the mean knowledge score advanced by 6.45 points. Student's paired *t*-test calculations reveal that the variance between baseline and post-intervention scores is statistically very highly significant (*p* = 0.000) for all areas. These outcomes confirm that the structured teaching framework is a highly effective educational tool for bridging critical health-literacy gaps in pre-adolescent girls.

Evaluation of Overall Knowledge Enhancement

To determine the collective impact of the Structured Teaching Programme (STP) on the study cohort, the cumulative pre-test and post-test scores across all information domains were analyzed using a Student's paired *t*-test.

Table 3: Cumulative Comparison of Overall Pre-test and Post-test Knowledge Scores (*N* = 80, *df* = 79)

Knowledge Parameter	Pre-test Mean (± SD)	Post-test Mean (± SD)	Mean of Differences (± SD)	Paired t-test Value
Overall, Knowledge Score	11.39 ± 2.08	25.72 ± 1.58	14.34 ± 2.76	<i>t</i> = 46.459**

***p* = 0.000 (Very Highly Significant)

The cumulative analysis highlights a profound shift in the sample's health literacy. Prior to the educational intervention, the pre-adolescent girls exhibited an overall mean knowledge score of just 11.39 out of a possible 30 points, underscoring systemic baseline ignorance. Following the STP, the overall mean score increased to 25.72, yielding a substantial net knowledge gain of 14.34 points.

The computed paired *t*-test value (*t* = 46.459) is exceptionally high and statistically very highly significant (*p* = 0.000). This statistical evidence conclusively proves that the Structured Teaching Programme was highly effective in systematically upgrading the comprehensive knowledge of pre-adolescent girls regarding female reproductive physiology, menarche preparedness, and sanitary hygiene management.

Association Between Socio-Demographic Variables and Baseline Knowledge

A Chi-square (χ^2) analysis was performed to determine whether baseline knowledge levels regarding menstruation and menstrual hygiene were significantly associated with specific socio-demographic characteristics of the pre-adolescent girls.

Table 4: Chi-Square Analysis of Demographic Variables and Pre-test Knowledge Levels ($N = 80$)

Demographic Variables	Category	Total (N)	Moderately Adequate n (%)	Inadequate n (%)	Chi-Square (χ^2) Metric	Significance
Age	9 Years	24	10 (41.7%)	14 (58.3%)	$\chi^2 = 4.348$ df = 3p = 0.226	NS
	10 Years	19	6 (31.6%)	13 (68.4%)		
	11 Years	20	7 (35.0%)	13 (65.0%)		
	12 Years	17	2 (11.8%)	15 (88.2%)		
Religion	Hindu	58	17 (29.3%)	41 (70.7%)	$\chi^2 = 3.766$ df = 2p = 0.152	NS
	Christian	4	3 (75.0%)	1 (25.0%)		
	Muslim	18	5 (27.8%)	13 (72.2%)		
Type of Family	Nuclear	56	15 (26.8%)	41 (73.2%)	$\chi^2 = 1.732$ df = 1p = 0.188	NS
	Joint	24	10 (41.7%)	14 (58.3%)		
Mother's Education	Primary/Secondary	51	16 (31.4%)	35 (68.6%)	$\chi^2 = 0.014$ df = 3p = 1.000	NS
	PUC	16	5 (31.2%)	11 (68.8%)		
	Graduation	3	1 (33.3%)	2 (66.7%)		
	No Formal Education	10	3 (30.0%)	7 (70.0%)		
Father's Occupation	Private	30	10 (33.3%)	20 (66.7%)	$\chi^2 = 2.813$ df = 3p = 0.421	NS
	Government	13	6 (46.2%)	7 (53.8%)		
	Business	2	0 (0.0%)	2 (100.0%)		
	Agriculture	35	9 (25.7%)	26 (74.3%)		
Dietary Habits	Vegetarian	17	3 (17.6%)	14 (82.4%)	$\chi^2 = 1.142$ df = 1p = 0.285	NS
	Mixed	63	22 (34.9%)	41 (65.1%)		
Place of Residence	Rural	71	23 (32.4%)	48 (67.6%)	$\chi^2 = 0.570$ df = 1p = 0.811	NS
	Remote Area	9	2 (22.2%)	7 (77.8%)		
Source of Information	Family Members	14	4 (28.6%)	10 (71.4%)	$\chi^2 = 1.080$ df = 4p = 0.897	NS
	Friends	18	5 (27.8%)	13 (72.2%)		
	Mass Media	8	2 (25.0%)	6 (75.0%)		
	Healthcare Personnel	17	7 (41.2%)	10 (58.8%)		
	Others	23	7 (30.4%)	16 (69.6%)		

NS = Not Statistically Significant ($p > 0.05$)

The consolidated Chi-square analysis demonstrates that no statistically significant association exists between the pre-test knowledge levels of pre-adolescent girls and any of the selected socio-demographic variables—including age, religion, maternal education, or baseline source of information ($p > 0.05$ across all tests).

The widespread deficit in reproductive health literacy—evidenced by the reality that the majority of participants scored in the "Inadequate" range regardless of subcategory—highlights that poor menarche preparedness is a uniform issue spanning across all demographic variations in the setting. Consequently, baseline knowledge is independent of socio-demographic backgrounds, underlining the universal necessity for structured institutional health interventions.

Conclusion

In conclusion, this study demonstrates a profound, universal deficiency in baseline knowledge regarding reproductive physiology, menarche preparedness, and menstrual hygiene among pre-adolescent girls in rural schools, completely independent of their socio-demographic backgrounds. The implementation of the Structured Teaching Programme (STP) yielded an exceptionally high and statistically significant improvement in knowledge across all evaluated domains, with the most substantial growth observed in menstrual hygiene management. These findings conclusively prove that structured, school-based health interventions are highly effective administrative tools for bridging critical health-literacy gaps, dispelling deeply entrenched cultural taboos, and cultivating a supportive environment that prepares young girls psychologically and physically for a healthy transition into womanhood.

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Conflicts of Interest

The authors declare no financial, personal, or professional conflicts of interest regarding the design, implementation, data analysis, or reporting of this study.

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This study received no financial support or sponsorship from any external funding agency. All operational expenses related to the development of the Structured Teaching Programme, validation of tools, and field-level data collection were borne entirely by the investigator.

Ethical Considerations and Informed Consent

Administrative approval was secured from the respective school authorities within the Hassan district. The purpose and scope of the study were explained clearly to all eligible pre-adolescent girls prior to initialization. Voluntary written assent was obtained from each subject, and complete confidentiality, anonymity, and data protection were strictly maintained throughout the duration of the educational programme.

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