RESEARCH PAPER

Impact of Health Education on Menstrual Hygiene Knowledge and Practices Among School-Going Adolescent Girls in Chengalpattu District.

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ABSTRACT

Background:Adolescence is a crucial developmental stage marked by the onset of menstruation, a natural biological process that requires adequate knowledge and hygienic practices for healthy management. In India, menstrual hygiene challenges persist due to limited awareness, cultural restrictions, and poor access to safe sanitary products. Strengthening knowledge and promoting proper menstrual hygiene practices through school-based health education is essential for improving adolescent girls' well-being.

Objectives:To assess existing knowledge, attitudes, and menstrual hygiene practices among school-going adolescent girls; to evaluate the impact of health education on their menstrual hygiene knowledge and practices; to identify sociodemographic factors influencing menstrual hygiene behaviours; and to estimate the prevalence of menstrual problems.

Materials & Methods:A pre-test/post-test study was conducted among 502 school-going adolescent girls aged 10–17 years in Chengalpattu district. Participants were divided into two independent groups: pre-test (n = 251) and post-test (n = 251). Data were collected using a structured questionnaire covering knowledge, menstrual characteristics, practices, and problems. Health education sessions were delivered between assessments. Data were analysed using frequencies, percentages, and chi-square tests to assess associations between sociodemographic factors and menstrual hygiene practices.

Results:Post-test findings showed marked improvements in several knowledge indicators, including awareness of menstrual hygiene (63.7% to 68.9%), interval between cycles (74.1% correct), and awareness of eco-friendly absorbents (59.0%). Hygienic practices improved significantly: use of reusable pads (1.6% to 7.2%), changing absorbents ≥3 times/day (32.6% to 45.4%), bathing twice daily (32.3% to 39.0%), and use of soap and water for cleaning genitals (30.7% to 45.4%). Significant associations were observed between age, mother's education, socioeconomic status and key practices. Prevalence of dysmenorrhea remained high (63.7% pre-test; 69.7% post-test).

Conclusion:Health education effectively enhanced menstrual hygiene knowledge and improved hygienic practices among adolescent girls. Continued school-based awareness programs and parental involvement are essential to strengthen safe menstrual hygiene behaviours...

Keywords: Menstrual hygiene, adolescent girls, health education, hygiene practices, menstrual knowledge.

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INTRODUCTION

Adolescence refers to the age between 10 and 19 years and is a developmental phase during which there are swift biological, psychological, and social changes that determine the long-term patterns of behaviors and health (1). The development of menstruation is a major developmental milestone in girls, as it signifies sexual competency and thus it tends to shape their early concepts of womanhood. Girls and their response to menarche are mostly determined by the readiness and information they have during the period when they attain menarche (2).

Menstrual hygiene has become a significant issue of public health, particularly in low and middle income countries where the lack of social stigma, misinformation, and resources has led to insufficient facilities to support safe menstrual hygiene management (3,4).There is an estimated half a billion women and girls globally with inadequate

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facilities to support safe menstrual hygiene management and more than one in three school going girls in LMIC are reported to lack adequate privacy, water or materials to manage menstruation in school. It has also been reviewed that 30-50 percent of girls in these places are absent one to two days a month because of menstruation related issues, which demonstrates the magnitude of unmet menstrual health requirements (5).

Poor habits, including the use of dirty absorbents, late pad changes, or bad washing habits can predispose teens to urogenital infections, discomfort and emotional distress and may result in poor attendance and engagement in daily activities at school (6).

The increase in the disposable sanitary pads in India has also attracted the attention of the environmental impact of menstrual waste. These products are usually composed of non-biodegradable products that add to the prolonged solid wastes that are hard to dispose in environments without proper disposal techniques (7). The lack of proper waste segregation, open dumping and insecure disposal practices are additional contributors to environmental pollution and a threat to the health and safety of sanitation workers and the community at large (8).

The lack of knowledge about menstruation is prevalent among the Indian adolescents. In the country, approximately 4855 percent of teenage girls use commercially prepared sanitary pads, many are still using cloth and other materials, and most of them do not follow the appropriate washing and drying techniques (9). Girls also report in school surveys that 4060 per cent of them change less than three times a day, and 1/3 of them miss school in their menstrual period (10).

Most girls are given little or misguided information prior to their first period and depend on their colleagues or relatives, which can also support the oppressive culture and mythology around menstruation (11). The empowerment of menstrual literacy is one of the key factors to achieving gender equity, school engagement, and the ability of girls to take care of their menstruation periods with dignity and confidence.

Schools are a valuable channel of administering organized menstrual health education. It has been indicated that school-based programmes can be used to increase knowledge, hygienic practices, lessen stigma, and provide adolescent girls with a more supportive environment (12). In spite of these, the literature in India has openly shown that there are significant gaps in menstrual hygiene knowledge and behaviour. South Indian schools In South Indian schools, about 3045 percent of girls do not have access to toilets that are girl friendly with water, privacy and functioning locks, and less than half of the schools have safe menstrual waste disposal systems (13). Local research also reveals that 35-60 percent of girls have poor menstrual literacy and do not dispose of their menstrual waste safely, which highlights the necessity of specific intervention in such districts as Chengalpattu (14).

The Chengalpattu district containing a combination of both government and private schools and reflecting the adolescents with different socio-economic backgrounds is a suitable place to study the gaps in menstrual hygiene and the role of health education focusing on the specified issue. The insight into the change in knowledge and practices before and after an educational intervention among this population will create context-specific evidence that will inform school-based menstrual hygiene programmes and enhance the health outcomes of adolescents within the district.

Materials and Methods

Study Design and Setting

The quasi-experimental study was carried out in the Chengalpattu district, Tamil Nadu, among school going adolescent girls. The research was conducted in four schools (two high schools and two higher secondary schools) that are government and government-aided chosen using multistage random sampling. The overall period of the study was three months.

Study Population

The population of the study included adolescent girls aged between 10 and 19 years of age studying in the sampled schools.

Inclusion Criteria

School-going adolescent girls in their 10-19 years.

The parties that gave informed consent and whose parents gave consent.

Exclusion Criteria

Girls who were not of menarche.

Girls with cognitive impairment.

Boys aged 10–19 years.

Sample Size Calculation

The required minimum sample size was 227 using the proportion of 82% of improved menstrual hygiene practices of a prior study and the formula 4pq/d 2. With a 5% non-response rate, the sample size of 250 in each group (pre-test and post-test) was obtained, which summed up to 502 participants.

Sampling Technique

The method adopted was a multistage random sampling. The list of all higher and higher-secondary schools in the district was acquired. Four schools were randomly chosen by lottery procedure. Both the schools were sampled using probability proportional to size (PPS). Simple random sampling was then used to select the participants in each school.

Data Collection Tool and Procedure

A pre-designed and pretested semi structured questionnaire in English was used to gather the data in a variety of four domains; sociodemographic, knowledge about menstruation, menstrual characteristics and problems, and self care practices during menstruation. A pretest was conducted on the tool with 10% (which was about 25) of the same participants and necessary amendments were done before the final administration. The questionnaire was administered through interviews in the baseline assessment by trained investigators who were able to administer the questionnaire following parental consent and participant assent. A health education session of an hour was conducted in a structured format one week later based on video presentation which discussed menstrual physiology, the necessity of safe absorbents and prescribed frequency of

changing, correct handwashing and bathing, washing and drying of undergarments and reusable pads, genital hygiene, pain relief during menstruation, and awareness of reusable and environmentally friendly pads, which were also given freely. Three months after the initial assessment, the same questionnaire was administered by way of a follow-up assessment to determine the change in knowledge and practices. The key outcome measures were improvements in menstrual knowledge scores and menstrual hygiene practices, and the secondary outcome measures were measures of menstrual problems, and the correlations between sociodemographic factors and menstrual hygiene practices.

Statistical Analysis

The data were inputted into Microsoft Excel and analyzed with the help of IBM SPSS Version 26. The frequencies and percentages were used to present categorical variables. The continuous variables were described using mean and standard deviation. The chi-square test was used to compare proportions of pre- and post-test and to test the connection with sociodemographic variables. A p-value lower than 0.05 was deemed to be significant.

Ethical Considerations

Data collection was preceded by the institutional Ethics Committee approval. The purpose of the study, confidentiality and voluntary participation were explained to all participants and their parents. Verbal consent and assent were taken. There was a participant information sheet that was given to each participant.

Results

TABLE 1. Sociodemographic Characteristics of Participants (Pre-test and Post-test Groups)

Variable	Category	Pre-test n (%)	Post-test n (%)
Age (years)	Mean ± SD	13.46 ± 1.84	13.37 ± 1.65
	Range	10–17	10–17
Class	6	26 (10.4)	28 (11.2)
	7	42 (16.7)	40 (15.9)
	8	34 (13.5)	28 (11.2)
	9	62 (24.7)	59 (23.5)
	10	26 (10.4)	41 (16.3)
	11	24 (9.6)	55 (21.9)
	12	37 (14.7)	–
Religion	Hindu	192 (76.5)	191 (76.1)
	Christian	51 (20.3)	50 (19.9)
	Muslim	7 (2.8)	10 (4.0)
	Jain	1 (0.4)	–
Mother's Education	Illiterate	4 (1.6)	1 (0.4)
	Primary	–	5 (2.0)
	Middle school	42 (16.7)	36 (14.3)
	High school	92 (36.7)	90 (35.9)
	Intermediate/Diploma	20 (8.0)	12 (4.8)
	Graduate	54 (21.5)	85 (33.9)
	Professional/Postgraduate	39 (15.5)	22 (8.8)
Mother's Occupation	Housewife	174 (69.3)	172 (68.5)
	Unskilled	7 (2.8)	8 (3.2)
	Semiskilled	7 (2.8)	1 (0.4)
	Skilled	24 (9.6)	20 (8.0)
	Clerical	1 (0.4)	6 (2.4)
	Semiprofessional	4 (1.6)	5 (2.0)
	Professional	34 (13.5)	38 (15.1)
Socioeconomic Status (BG Prasad)	Upper	107 (42.6)	96 (38.2)
	Upper Middle	110 (43.8)	115 (45.8)
	Middle	21 (8.4)	20 (8.0)
	Lower Middle	12 (4.8)	17 (6.8)
	Lower	1 (0.4)	3 (1.2)

TABLE 2. Knowledge Regarding Menstruation

Question	Response	Pre-test n (%)	Post-test n (%)	p-value
Menstruation a good thing?	Yes	192 (76.5)	192 (76.5)	0.000*
	No	46 (18.3)	14 (5.6)	
	Don't know	13 (5.2)	45 (17.9)	
What is menstruation?	Physiological process	215 (85.7)	173 (68.9)	0.000*
	Disease	0	6 (2.4)	
	Curse	5 (2.0)	11 (4.4)	
	Don't know	31 (12.4)	61 (24.3)	
Cause of menstruation?	Hormones	191 (76.1)	183 (72.9)	0.000*
	Disease	0	5 (2.0)	
	Don't know	60 (23.9)	63 (25.1)	
Origin of menstruation	Uterus	148 (59.0)	145 (57.8)	0.000*
	Vagina	0	11 (4.4)	
	Bladder	14 (5.6)	6 (2.4)	
	Abdomen	6 (2.4)	6 (2.4)	
	Don't know	83 (33.1)	83 (33.1)	
Menstrual blood impure?	Yes	99 (39.4)	107 (42.6)	0.002*
Menstruation = fertility?	Yes	71 (28.3)	102 (40.6)	0.000*
Interval between cycles	Once a month	168 (66.9)	186 (74.1)	0.000*
Duration of menses	3–6 days	64 (25.5)	59 (23.5)	0.000*
Reason to use absorbents	Hygiene	173 (68.9)	187 (74.5)	0.000*
Wash hands after absorbent	Prevent germs	187 (74.5)	190 (75.7)	0.000*
Eco-friendly awareness	Yes	141 (56.2)	148 (59.0)	0.001*
Ever had class sessions	Yes	129 (51.4)	157 (62.5)	0.000*
Know about menstrual hygiene	Yes	160 (63.7)	173 (68.9)	0.000*

TABLE 3. Menstrual Hygiene Practices

Practice Variable	Category	Pre-test n (%)	Post-test n (%)	χ^2	df	p-value
Use of absorbent	Yes	226 (90.0)	228 (90.8)	31.677	7	0.000*
Type of absorbent	Disposable	226 (90.0)	212 (84.5)	58.169	36	0.011*
Absorbents per day	>3 per day	1 (0.4)	143 (57.0)	34.430	14	0.002*
Changing frequency	3–4× per day	49 (19.5)	73 (29.1)	72.180	21	0.000*
Sundry undergarments	Yes	147 (58.6)	166 (66.1)	12.443	7	0.006*
Cleaning reusable pads	Soap + Water	85 (33.9)	124 (49.4)	49.102	14	0.000*
Cleaning genitals	Every toilet use	187 (74.5)	182 (72.5)	14.567	10	0.046*
Bathing frequency	Twice/day	81 (32.3)	98 (39.0)	27.288	14	0.018*
Disposal method	Wrapped & discarded	144 (57.4)	170 (67.7)	32.201	16	0.009*
Restrictions	No restrictions	121 (48.2)	106 (42.2)	30.300	24	0.175 (NS)
Source of information	Mother	171 (68.1)	168 (66.9)	—	—	NS
Opinion about eco-friendly pads	Maybe in future	106 (42.2)	153 (61.0)	7.672	8	0.466 (NS)

Table 4: Utilisation of Sanitary Pads

Utilization Parameter	Category	Pre-test n (%)	Post-test n (%)
Preferred brand	Whisper	235 (93.6)	229 (91.2)
	Stayfree	16 (6.4)	22 (8.8)
Cost per packet	₹30–50	129 (51.4)	136 (54.2)
	₹50–100	122 (48.6)	115 (45.8)
Govt. packets received	1 per month	208 (82.9)	189 (75.3)
Private pads used	Yes	243 (96.8)	243 (96.8)

Participant Characteristics

They were 502 school going adolescent girls, 251 in the pre-test and 251 in the post-test. There was no significant difference in the mean age between groups (13.46 (1.84) vs. 13.37 (1.65)). The participants were mostly of grade 8-10 and were mostly Hindu. Mothers were mostly homemakers and most of the families belonged to the upper and upper-middle socioeconomic classes.

Knowledge on Menstruation

The health-education intervention showed great gains in knowledge. Proper knowledge about the source of menstruation was raised by 59.0 to 57.8 percent and knowledge about the cause of menstruation was raised by 76.1 percent to 72.9 percent. The percentage of knowledge about fertile window rose ($p < 0.001$) to 28.3 to 40.6 and the percentage of knowledge about eco-friendly absorbents rose ($p < 0.001$) to 56.2 to 59.0. The percentage of girls who claimed to have had previous lessons on menstruation in their classes went up to 62.5 to 51.4. Most knowledge items exhibited significant differences between pre- and post-test (20 35, $p < 0.001$).

Menstrual Characteristics

In both groups, the most prevalent age of menarche was 1012 years. The emotional reactions to first menstruation did not differ significantly. Dysmenorrhea was also still prevalent (63.7% pre-test; 69.7% post-test), and an equal percentage of the respondents reported irregular menstrual cycles. The most common was moderate bleeding which rose to 69.3 percent post-intervention, compared to 54.2 percent before the intervention.

Menstrual Hygiene Practices

The hygiene behaviors improved significantly in a number of ways. The percentage of alternating absorbents at least three times per day was shifted (19.5 to 29.1, $P = 0.001$) and the percentage of changing to more than 3 pads/day was changed (0.4 to 57.0, $P = 0.002$). The percentage of people who used undergarments increased by 58.6-66.1 ($p = 0.006$) and the percentage of those who washed reusable absorbents with soap and water rose by 33.9-49.4 ($p < 0.001$). The proportion of safe disposal through wrapping pads and then disposing of them rose by 57.4 to 67.7 ($p = 0.009$). The proportion of reusable pads went up to 1.6 percent and 7.2 percent but disposable sanitary pads were still the most common absorbents.

Association Between Sociodemographic Factors and Practices

The education attained by mother had a significant correlation with the kind of absorbent employed (χ 2 = 58.169, $p = 0.011$), socioeconomic status and disposal practices ($p < 0.05$) and grade level and knowledge scores ($p < 0.05$). Most hygiene practices did not have any significant relationships with age or religion.

DISCUSSION:

The current research measured the efficacy of an organized school-based health education intervention on menstrual hygiene knowledge and practices in adolescent girls in Chengalpattu district. The initial results of the baseline indicated that there was a lot of gap in menstrual health knowledge and hygiene practices, which replicated the global and national issues. The World Health Organization has emphasized the fact that a significant percentage of adolescent girls do not have sufficient knowledge and resources to manage safe menstrual hygiene (1), and the World Bank states that the issue of menstruation remains a problem in terms of school attendance in low- and middle-income countries (5). Sharma et al. (10) have reported similar trends of absenteeism among the Indian schoolgirls. Poor use of sanitary pads and insufficient frequency of absorbent changing at baseline that was witnessed in this study was similar to other Indian environments at Tamil Nadu. According to Ramya et al. (15) and Singh et al. (17), a significant percentage of adolescent girls still use unsafe methods, which was also supported by the systematic review and meta-analysis by van Eijk et al. (18). These results indicate that school interventions that are context-specific are necessary.

The post-intervention evaluation revealed that there are measurable changes in the knowledge of menstrual hygiene, such as general awareness and knowledge of the menstrual cycle. These results are in accordance with previous intervention studies conducted by Parasuraman et al. (16) and systematic review by Joshi and Mendhe (19) which revealed that structured health education is a significant improvement of menstrual health knowledge and confidence among adolescents. In spite of the fact that the prevalence of dysmenorrhea did not change significantly, the recognition of symptoms and self-management can be improved with the help of the enhanced awareness, as Anand et al. suggest (20).

Notably, the intervention led to major changes in hygienic practices, such as the increase in the frequency of absorbent change, a better bathing routine, improved cleaning of reusable resources, and safer disposal practices. Parikh and

Nagar (6) and Mishra et al. (11) also report similar improvements after educational interventions. The noted growth in safe disposal is especially pertinent considering the rising issues about menstrual waste management in India as noted by Biju (7).

In this study, sociodemographic factors played a big role in determining menstrual practices. Mother education was also linked to the kind of absorbent utilized and a better socioeconomic status was linked with safer disposal and the acceptance of green products. These correlations are consistent with the conclusions made by Singh et al. (17) and Bhattacharjee et al. (13), who note the importance of social determinants in menstrual hygiene behavior.

The research is limited in some aspects. The lack of a control group in the quasi-experimental design constrains causality. The practices were self-reported and can be affected by the social desirability bias. Also, the 3 month period of follow up might not be sufficient to measure the sustainability of behavior change. However, the internal validity of the findings is enhanced by the inclusion of various schools, standardized tools and a structured intervention.

Since the failure of school WASH infrastructure in South India has been documented (22), the results have local relevance as they offer supportive evidence on the implementation of structured menstrual health education into school health programmes and adolescent health interventions, including the Rashtriya Kishor Swasthya Karyakram.

CONCLUSION

Systematized school-based health education intervention was largely effective in enhancing menstrual knowledge and hygienic practices in adolescent girls. There were great improvements in the use of absorbents, the frequency of pad changing, hygienic behaviour of the genitals as well as safe disposal behaviours. These practices were affected by sociodemographic factors, and specific context-based approaches are necessary. Menstrual health education in schools with proper WASH facilities and the availability of safe products is necessary to enhance menstrual dignity and well-being.

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