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EFFECTIVENESS OF WASH METHOD ON MENSTRUAL HEALTH AMONG ADOLESCENT GIRLS AT SELECTED SCHOOL, CHENNAI

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ABSTRACT

Background Menstrual health management remains a major concern for adolescent girls, particularly in low-resource school environments where water, sanitation, and hygiene (WASH) facilities are inadequate. Poor knowledge and lack of proper hygiene practices during menstruation negatively affect girls' school attendance, participation, and overall well-being. Structured educational interventions and improved WASH accessibility can significantly enhance menstrual health knowledge and reduce related stigma. **Aim of the Study:** The atudy aimed to assess the effectiveness of a structured WASH-based information booklet on improving menstrual health knowledge among adolescent girls. **Methods:** A quantitative one-group pre-test and post-test research design was adopted among 100 adolescent girls aged 12–18 years who had attained menarche at a selected school. A structured questionnaire assessed demographic variables and menstrual health knowledge. After the pre-test, an information booklet on WASH practices was administered, followed by a post-test. Data were analyzed using descriptive and inferential statistics, including paired t-test and chi-square test.**Results:** Before the intervention, 58% of the participants demonstrated poor menstrual health knowledge, while none achieved an extremely effective level. Following the WASH intervention, 59% reached an extremely effective knowledge level and no student remained in the poorly effective category. The mean score increased from 10.74 in the pre-test to 21.02 in the post-test, showing a highly significant improvement ($p < 0.001$). Educational standard and age at menarche showed significant association with post-test knowledge levels. **Conclusion:** The WASH intervention significantly improved menstrual health knowledge among adolescent girls. Culturally appropriate WASH-based education programs in schools can enhance menstrual health practices and support improved academic participation and well-being.

INTRODUCTION

Menstrual health management (MHM) remains a significant issue in the field of public health, particularly among adolescent females in thirdworld nations. Girls often experience problems when they start their menstrual cycle, and this may impact their normal school attendance, focus, and confidence in the classroom. These difficulties are directly connected to the inadequacy of quality water, sanitation, and hygiene (WASH) facilities in schools, which may cause shame and stigma of menstruation **(1, 2)**. Research has indicated that a significant number of girls skip school or even leave it due to the inability to have a safe and comfortable period **(3–5)**.

Appropriate health education has been shown to make a difference. Girls who receive the correct information and useful knowledge about menstrual hygiene can more easily cope with their periods and simultaneously increase their attendance in school and academic achievements **(6, 7)**. Menstrual education programs including access to sanitary products have been demonstrated to be effective to support the health of girls and also improve their learning outcomes **(6, 7)**. Studies also stress that with the proper provision of facilities at schools in the form of clean toilets, personal changing areas, and access to water, as well as proper education, the adverse effects of menstruation on school life can be significantly minimized **(8, 9)**.

Following this knowledge, the current research paper focuses on evaluating the workability of a WASH-based intervention on enhancing menstrual health in adolescent girls in sampled schools. The purpose of this integrated intervention is to improve the hygienic situation and enhance the well-being of young girls so that they can be spared at this critical period in life. The results are likely to inform realistic measures that will allow developing safer and more inclusive schools, which, in turn, will enable girls to pursue their education with dignity and confidence **(10, 11)**.

AIM OF THE STUDY

The atudy aimed to assess the effectiveness of a structured WASH-based information booklet on improving menstrual health knowledge among adolescent girls.

METHODOLOGY:

Study Design and settings

A quantitative research approach with a one-group pre-test and post-test design was used to assess the effectiveness of the information booklet on WASH practices related to menstrual health. The study was conducted for a duration of one month at Adi Dravidar Welfare Higher Secondary School, Kolappancheri, Poonamallee, Thiruvallur.

Participants and Sampling

The participants were adolescent girls aged 12–18 years who had attained menarche and were studying in the selected school. A convenient sampling technique was adopted to select 100 samples based on eligibility and willingness to participate. Girls who had not attained menarche or were unwilling to participate were excluded from the study.

Validity and Tools for Data Collection

The tool consisted of two sections: demographic variables and multiple-choice questions to assess knowledge regarding menstrual health and WASH practices. Content validity was established by expert review, and necessary modifications were made. Reliability was ensured through test-retest reliability and internal consistency methods relevant to menstrual hygiene and WASH assessment tools. A pilot study was conducted among 10 students to check the feasibility and reliability before the main data collection.

Ethical Consideration

Ethical approval was obtained from the Institutional Ethical Committee prior to the study. Permission from school authorities was secured. Informed consent was obtained from all eligible participants, and confidentiality and anonymity were strictly maintained throughout the study.

Data Collection Procedure

Data collection was carried out over two weeks. After obtaining permission and selecting the samples, a pre-test was administered to assess baseline knowledge. An information booklet on menstrual WASH practices was distributed to the participants. A post-test was then conducted to evaluate the improvement in knowledge. Confidentiality of the participants' responses was ensured throughout the data collection process.

Statistical Analysis of Data

The collected data were analyzed based on the study objectives using descriptive and inferential statistics. Frequency, percentage, and mean were used to summarize the level of knowledge among adolescent girls. Chi-square test was employed to determine the association between knowledge scores and selected socio-demographic variables.

RESULTS:

Demographic variables of the Adolescent Girls

The demographic data show that the majority of adolescent girls were aged 12–14 years (46%), with most studying in 5th–7th standard (88%). More than half of the participants were Hindu (54%). Regarding parental education, 40% of fathers and 32% of mothers had primary education, while 33% of fathers and 37% of mothers were illiterate. Nearly half of the families had a monthly income between ₹5,000–10,000 (48%), and 59% belonged to nuclear families. Most girls attained menarche at 11 years (53%), had a menstrual cycle interval of 28 days (53%), and experienced menstruation for three days (52%). (Table 1)

Level of Menstrual Health among Adolescent Girls

In the pre-test, more than half of the adolescent girls (58%) demonstrated poorly effective menstrual health knowledge, while only 16% showed a moderately effective level and none achieved extremely effective knowledge. After the intervention, there was a marked improvement where 59% of the girls reached an extremely effective level and 35% demonstrated a moderately effective level, with no participants remaining in the poorly effective category.(Table 2)

Effectiveness of WASH Method

The comparison of pre-test and post-test scores shows a substantial increase in the mean menstrual health knowledge score from 10.74 to 21.02 after the WASH intervention. The paired t-test value ($t=25.748$, $p=0.0001$) indicates a highly significant improvement at $p<0.001$, confirming that the WASH method was effective in enhancing menstrual health knowledge among adolescent girls. (Table 3) A significant association was observed between the post-test

level of menstrual health and the educational standard ($\chi^2 = 6.055$, $p = 0.048$), as well as age at menarche ($\chi^2 = 10.725$, $p = 0.030$), indicating that both variables influenced the effectiveness of the intervention among adolescent girls. (Table 4)

Table 1: Demographic Variables of Adolescent Girls. N = 100

Demographic Variables	Category	Frequency (f)	Percentage (%)
Age	10 – 12 years	33	33.0
	12 – 14 years	46	46.0
	14 – 16 years	21	21.0
	16 – 19 years	0	0.0
Educational Standard	5th – 7th standard	88	88.0
	8th – 9th standard	12	12.0
	10th – 11th standard	0	0.0
	12th standard	0	0.0
Religion	Hindu	54	54.0
	Muslim	26	26.0
	Christian	20	20.0
	Others	0	0.0
Father's Education	Primary education	40	40.0
	Higher education	26	26.0
	Illiterate	33	33.0
	Literate	1	1.0
	Graduated	0	0.0
Mother's Education	Primary education	32	32.0
	Higher education	31	31.0
	Illiterate	37	37.0
	Literate	0	0.0
	Graduated	0	0.0
Monthly Family Income	₹5,000 – 10,000	48	48.0
	₹10,000 – 20,000	44	44.0

	₹20,000 – 30,000	8	8.0
	More than ₹30,000	0	0.0
Type of Family	Nuclear family	59	59.0
	Joint family	41	41.0
Age at Menarche	10 years	34	34.0
	11 years	53	53.0
	12 years	13	13.0
	13 years and above	0	0.0
Interval Between Menstrual Cycles	30 days	28	28.0
	28 days	53	53.0
	21 days	18	18.0
	35 days	1	1.0
	40 days	0	0.0
Duration of Menstrual Cycle	3 days	52	52.0
	4 days	40	40.0
	5 days	8	8.0
	6 days	0	0.0
	7 days	0	0.0

Table2: Level of Menstrual Health among Adolescent Girls.N = 100

Level of Menstrual Health	**Pre-test (f)**	**Pre-test (%)**	**Post-test (f)**	**Post-test (%)**
Poorly effective	58	58.0	0	0.0
Mildly effective	26	26.0	6	6.0
Moderately effective	16	16.0	35	35.0
Extremely effective	0	0.0	59	59.0

Table3: Effectiveness of WASH Method on Menstrual Health among Adolescent Girls N = 100

Test	Mean	SD	Median	Mean Difference	Paired t-test & p-value
Pre-test	10.74	3.61	9.0	10.28	t = 25.748, p = 0.0001 (S***)
Post-test	21.02	3.28	22.0		

***p < 0.001 (Highly significant)

Table:4 Association of Post-test Level of Menstrual Health with selected demographic variables.

Demographic Variable	Category	Mildly Effective f (%)	Moderately Effective f (%)	Extremely Effective f (%)	χ^2, df, p-value, Significance
Educational Standard	5th–7th standard	6 (6.0)	34 (34.0)	48 (48.0)	χ^2 = 6.055, df = 2, p = 0.048, S*
	8th–9th standard	0 (0.0)	1 (1.0)	11 (11.0)	
Age at Menarche	10 years	0 (0.0)	12 (12.0)	22 (22.0)	χ^2 = 10.725, df = 4, p = 0.030, S*
	11 years	4 (4.0)	15 (15.0)	34 (34.0)	
	12 years	2 (2.0)	8 (8.0)	3 (3.0)	
	13 years & above	0 (0.0)	0 (0.0)	0 (0.0)	

DISCUSSION

The results of the study indicate a significant improvement in menstrual health knowledge among adolescent girls following a structured WASH (Water, Sanitation, and Hygiene) intervention. Initially, a considerable 58% of participants were categorized as having poor menstrual health knowledge in the pre-test. After the intervention, 59% of participants achieved an extremely effective level of knowledge, with no participants remaining in the poorly effective category. The statistical analysis revealed a substantial difference in mean scores, with the pre-test mean of 10.74 significantly increasing to a post-test mean of 21.02 ($t = 25.748$, $p < 0.001$).

These findings support the effectiveness of the WASH intervention in enhancing menstrual health education.

The improvement observed in this study aligns with related studies highlighting the impact of structured educational programs on menstrual health knowledge. For instance, Ghimire et al. (2024) demonstrated that health education interventions significantly improved menstrual hygiene knowledge and practices among adolescent girls in Nepal, resonating with this study's results (12).

Moreover, previous research by Maurya et al. (2022) evaluated the effectiveness of structured teaching programs on menstrual hygiene and corroborated the current study's results. They reported similar advancements in knowledge levels among adolescent girls following such interventions (13).

Additionally, sociocultural factors significantly influence young girls' menstrual hygiene practices. Lalramnghaki and Singh (2023) noted that inadequate knowledge, coupled with socio-economic challenges such as poverty and cultural taboos, often leads to poor menstrual hygiene practices. This scenario contributes to girls' reluctance to seek straightforward health information and support (14). Thus, the findings of this study reinforce the necessity of addressing underlying sociocultural barriers while implementing health education interventions.

Furthermore, Muthulakshmi et al. (2022) found no significant associations between menstrual hygiene knowledge levels and demographic factors, suggesting that interventions like the WASH program can level the knowledge field despite varying backgrounds (15). Similarly, Sonowal et al. (2021) reported that demographic variables influence menstrual hygiene practices, indicating that targeted educational interventions could mitigate inequities in knowledge stemming from socio-economic disparities (16).

The conclusions drawn from the current study underscore the need for comprehensive menstrual health education strategies anchored in WASH principles. Ahmed (2020) highlighted that mHealth-based education significantly strengthens reproductive health knowledge among adolescent girls (17), while Rahman et al. (2024) demonstrated that integrating mobile health

with school-based education can improve menstrual hygiene knowledge and practices in rural populations (18).

In summary, this study illustrates the marked success of the WASH intervention in improving menstrual health knowledge among adolescent girls. It highlights the importance of continued investment in structured educational programs that consider sociocultural dynamics and promote enduring health literacy essential for the empowerment and well-being of young girls.

CONCLUSION

The study concludes that the structured WASH (Water, Sanitation, and Hygiene) intervention was highly effective in significantly improving menstrual health knowledge among adolescent girls. A substantial shift from poor to extremely effective knowledge levels was observed after the intervention, with statistical evidence supporting this improvement. The findings emphasize the importance of implementing structured and culturally sensitive menstrual health education programs that address knowledge gaps and sociocultural barriers. Such interventions contribute to better menstrual hygiene understanding, promote healthier practices, and ultimately support the overall well-being and empowerment of adolescent girls.

LIMITATIONS:

The study was limited by its small sample size, reliance on self-reported responses that may introduce bias, and a short follow-up period that did not assess long-term knowledge retention. These factors may affect the generalizability and sustainability of the findings.

RECOMMENDATIONS:

Future studies should involve larger and more diverse populations with extended follow-up assessments to evaluate lasting behavioral changes. Additionally, integrating culturally appropriate education and digital learning strategies is recommended to further enhance menstrual health knowledge among adolescents.

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