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Menstrual Hygiene Among Adolescent Schoolgirls in Selected Schools in Kilinochchi, Sri Lanka

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Abstract

Despite being a critical aspect of women's health, menstrual hygiene receives limited attention in low-income countries. This descriptive cross-sectional study assessed the knowledge and practices related to menstrual hygiene, along with associated factors, among adolescent schoolgirls (n=375) attending government schools in the Kilinochchi District, Sri Lanka. The sample size was determined using the Lwanga and Lemeshow (1991) formula. Data on socio-demographic characteristics, menstrual patterns, and menstrual hygiene knowledge and practices were collected using a pre-tested, self-administered questionnaire, following parental assent. Ethical approval was granted by the National Institute of Health Sciences (NIHS), Kalutara, Sri Lanka. The mean age of the participating adolescent schoolgirls (range 14–16 years) was 14.98 ± 0.8 years. Among them, 54.1% demonstrated good knowledge, while 62.9% exhibited good practices related to menstrual hygiene. The average knowledge score was 9.66 ± 1.5, and the average practice score was 7.89 ± 1.2. The mean age at menarche was 12.82 ± 1.0 years, and the average duration of menstrual flow was 5.4 ± 1.3 days, with a range of 2 to 11 days. Additionally, nearly half (54.7%) of the respondents reported having menstrual cycles shorter than 28 days. There was no significant correlation between knowledge and menstrual hygiene practices in this population ($r = -0.035$, $p = 0.504$). Consequently, the hypothesis that greater knowledge leads to improved practices among adolescent schoolgirls in the Kilinochchi District is not supported. However, the hypothesis that socio-economic factors influence menstrual knowledge and practices is partially validated, as older age was significantly associated with better knowledge (Logistic regression; OR=0.377, p=0.005) and practices (Logistic regression; OR=1.770, p=0.046). Further research is required to gain a deeper understanding of the underlying factors influencing menstrual hygiene knowledge and practices in this population.

KEYWORDS: *Government schoolgirls, Knowledge, Menstrual hygiene management, Practice*

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1 INTRODUCTION

Approximately half of the global female population is of reproductive age, and at any given time, one-quarter of them are menstruating (Adhikari 2007; UNICEF 2011). Over the past decade, menstrual health and hygiene management (MHHM) has emerged as a significant public health concern due to its implications for physical health, social well-being, and human rights (Sommer et al. 2015). MHHM is defined as the ability to access and use private sanitation facilities with soap and water for washing and bathing during menstruation, alongside the use of clean menstrual materials that are changed at least three times daily, stored safely, and disposed of appropriately (Ramaiya et al. 2019). MHHM is also recognized as a public health priority with a critical role in reducing the gender gap in education, particularly for adolescent girls. However, in many developing countries, MHHM remains inadequately addressed, and its role in achieving several Sustainable Development Goals (SDGs) is not fully recognized (WaterAid 2009).

Menstrual hygiene (MH) requires focused attention and should be integrated into comprehensive service packages that provide safe spaces for discussion, adequate water supply, privacy, and appropriate facilities for washing and disposing of used sanitary materials (Tjon 2007). A lack of such resources, particularly in school settings, can significantly impact on the self-esteem and well-being of young girls, hindering their ability to manage menstruation with dignity (Mahon & Fernandes 2010). Evidence suggests that adolescent girls are more likely to practice good menstrual hygiene if they have mothers with higher literacy levels, receive information about menstruation prior to menarche, have access to sanitary facilities at home, are exposed to media messaging about menstrual products, and belong to higher socioeconomic strata (Tharke et al. 2011; House et al. 2012).

Menstruation is often bounded by social and religious taboos, which contribute to the dissemination of inaccurate or incomplete information, thereby hindering proper menstrual hygiene management (El-Gilany et al. 2005; Sommer & Sahin 2013). These cultural constraints can result in feelings of shame and embarrassment, particularly among young girls at the onset of menarche, which in turn may lower their self-esteem and impair their capacity to make informed decisions regarding their sexual and reproductive health (Abera 2004; Sommer & Sahin 2013; Sommer et al. 2015). Misconceptions and harmful practices related to menstrual hygiene among women of reproductive age can negatively impact health and are thought to be associated with an increased risk of infections, including bacterial vaginosis (BV) and vulvovaginal candidiasis (VVC) (Sumpter & Torondel 2013; Gupta et al. 2015).

Among the various factors influencing menstrual hygiene, knowledge about menstruation plays a pivotal role in shaping hygienic practices (Adhikari 2007; Goel et al. 2018). A clear understanding of the menstrual cycle, the importance of maintaining hygiene

during menstruation, and the correct use of sanitary products is associated with healthier and more effective menstrual practices (Goel et al. 2018). Evidence from previous studies indicates that when adolescent girls receive accurate information on menstrual health, they are more likely to adopt behaviors that reduce the risk of infections, alleviate menstrual discomfort, and promote overall well-being (Adhikari 2007). Therefore, enhancing menstrual health literacy is essential for fostering appropriate menstrual hygiene practices, particularly in settings where access to education and sanitary resources is limited (Adhikari 2007). Approximately 4.2 million individuals menstruate in Sri Lanka, yet only 30% have access to disposable menstrual hygiene products. The affordability of these products has been significantly impacted by high import taxes, which initially stood at 52% and, despite a revision to 43%, continue to make them largely inaccessible for individuals from low-income households (Goluhewage 2023; UNFPA 2025).

Improving menstrual hygiene (MH) in any population requires a clear understanding of the level of knowledge, practices, and associated factors related to menstrual health, particularly among adolescent schoolgirls. In Sri Lanka, there is a notable gap in the literature regarding schoolgirls' menstrual health knowledge and hygiene practices, as well as the factors influencing them. According to Goluhewage (2023), "education" is one of the major areas impacted by period poverty in Sri Lanka. Even before the economic crisis, approximately 37% of students missed one or two days of school during menstruation, primarily due to fear of embarrassment, stigma, or parental discouragement rooted in cultural beliefs. Since the onset of the economic crisis, this figure has increased to 50%, and it is likely to rise further if the government does not take action to eliminate discriminatory taxes on menstrual hygiene products.

The current study aims to address this knowledge gap by assessing the MH practices and MH knowledge among adolescent schoolgirls in the Kilinochchi district of Sri Lanka, along with the key determinants influencing these behaviours and their MH knowledge.

1.1 Theoretical basis

In health behavior research, the Knowledge, Attitude, and Practice (KAP) model is frequently employed to examine the relationship between what individuals know, how they feel, and how they behave in relation to health issues. According to this model, health-related behaviors are shaped by the individual's level of knowledge, the attitudes formed from that knowledge, and the translation of those attitudes into practice (Gupta et al. 2015). Based on this framework, we propose the first hypothesis: "*A higher level of knowledge about menstruation is associated with better menstrual hygiene practices among schoolgirls in the Kilinochchi District*."

In addition to the KAP model, the Ecological Model has also been applied in menstrual health research. This model posits that health behaviors are influenced by multiple levels of

factors, including individual, interpersonal, organizational, community, and societal determinants (Tjon 2007; Mahon & Fernandes 2010). It emphasizes the importance of broader contextual influences, such as cultural norms, socioeconomic conditions, and the role of educational institutions, in shaping individual behaviors (Goel et al. 2018). In the context of the current study in the Kilinochchi District, environmental and cultural factors, such as stigma surrounding menstruation or institutional support for menstrual health education, may significantly impact schoolgirls' knowledge and practices. Therefore, we propose a second hypothesis: "*Socioeconomic and environmental factors influence the level of knowledge and menstrual hygiene practices among schoolgirls in the Kilinochchi District.*"

2 MATERIALS AND METHODS

This descriptive cross-sectional study was conducted among schoolgirls in grades 9 to 11 (aged between 13 -17 years) who had already attained menarche, from randomly selected government schools in Kilinochchi district.

2.1 Study area

Kilinochchi district, located in Northern Province of Sri Lanka is placed 100 km south-east of Jaffna. According to the School Census Report, 2017 of the Ministry of Education, Sri Lanka, there are 104 government schools in the entire district. However, there are only 63 government schools with grade 9 to 11 classes.

2.2 Sampling

Sample size was determined using the following standard equation.

$$Z^2P(1-P)/d^2 \quad (1)$$

It had a desired precision of 5% (d). The prevalence of 33% for poor practices regarding MH was used based on the existing literature (Sujirtha et al. 2017). Accordingly, the minimum sample size required was 340, however, the sample size was increased to 400 students to accommodate a 15% non-response rate. A multi-stage probability sampling method was used to select the sample. A list of all Government schools with grade 9 to grade 11 classes in the Kilinochchi District was prepared and four schools were selected using a random number generator. The selection of study subjects from each school was performed randomly based on a computer-based random number generator.

2.3 Questionnaire survey

A self-administered, pre-tested questionnaire was developed to assess menstrual hygiene knowledge and practices, with face and content validity evaluated by a panel of subject matter experts. Initially prepared in English, the questionnaire was subsequently translated into Sinhala and Tamil to ensure linguistic accessibility and cultural relevance. The instrument comprised four sections: Part A collected demographic information, including age, religion, parental education and occupation, monthly family income, and availability of latrine facilities. The knowledge and practice components consisted of 15 and 12 questions, respectively. For scoring, each correct response was awarded one point, while

incorrect responses received zero. The total knowledge scores were categorized as poor (scores 1–10) and good (scores 11–15), and practice scores were similarly classified as poor (scores 1–7) and good (scores 8–12). These cut-off values were determined using the mean score for each domain, as the data were normally distributed.

2.4 Pre-Testing

The questionnaire was pre-tested among 20 schoolgirls from Grades 9 to 11 at Mankulam Maha Vidyalayam in the Mullaitivu District. Based on the feedback received and issues identified during the pre-testing phase, necessary modifications were made to enhance clarity, relevance, and comprehensibility before final implementation in the main study.

2.5 Data collection

Each selected school was visited, and the principal and relevant staff were informed about the objectives and significance of the study. Following this briefing, the necessary permissions were obtained. Students who provided informed assent were then given a brief explanation of the study's purpose, after which the questionnaire was distributed for completion.

2.6 Data analysis

Primary data were entered into Microsoft Excel 2010 and subsequently exported to IBM SPSS Statistics software version 22 for analysis. The levels of menstrual health knowledge and hygiene practices were treated as dependent variables, while demographic and background characteristics collected in Part A of the questionnaire served as independent variables. Descriptive statistics, including frequencies, percentages, ranges, and means, were used to summarize the data. Bivariate analysis was performed using a Binary Logistic Regression Model to examine associations between independent variables and the outcomes of interest.

Assumptions for the binary logistic regression model were assessed prior to analysis. These included:

- Binary outcome variable – each dependent variable was dichotomized (e.g., poor vs. good knowledge/practice).
- Independence of observations – each participant contributed a single, independent observation.
- No multicollinearity – independent variables were assessed for intercorrelations to ensure that multicollinearity did not distort the model.
- Linearity in the logit – continuous predictors, if any, were tested for a linear relationship with the log odds of the dependent variable.
- Adequate sample size – the sample size met the minimum requirement for stable estimation of parameters.

A p-value of ≤ 0.05 was considered statistically significant.

2.7 Administrative requirements

Permission from the Zonal educational department and the respective principals were obtained.

2.8 Ethical considerations

Ethical approval for the study was obtained from the Ethics Review Committee of the National Institute of Health Sciences (NIHS), Kalutara, Sri Lanka (Approval No. NIHS/ECR/19/07). Written informed assent was obtained from the parents or legal guardians of all participants prior to data collection.

3 RESULTS & DISCUSSION

3.1 Knowledge on menstrual hygiene

Of the 375 participants, 54.1% demonstrated good knowledge of menstruation, while 45.9% had poor knowledge, with a mean knowledge score of 10.29±1.59 with a range of 5 - 14. The majority (89.1%) correctly identified menstruation as a physiological process, and 38.4% recognized that the release of white vaginal discharge a few days prior to menstruation is normal. A high proportion (94.0%) were aware that menstrual blood is discharged through the vagina, and 55.5% correctly understood the role of hormones in regulating the menstrual cycle. When asked whether they emit a foul odor during menstruation, only 28.8% of participants disagreed. 87.2% believed that menstrual blood is unhygienic. Awareness of the advantages of using sanitary pads instead of cloth was high, with 97.6% acknowledging their benefits. Additionally, 81.1% of participants recognized that maintaining personal hygiene can help prevent menstrual pain, and 86.7% were aware that poor menstrual hygiene may increase the risk of infection.

Most respondents understood the importance of changing sanitary pads regularly (96.3%) and washing the genital area frequently during menstruation (97.6%). Furthermore, 76.3% were aware that heavy menstrual bleeding could lead to anemia, and 84.3% knew that menstruation lasting longer than eight days requires medical attention. While 76.0% believed that consuming marine food during menstruation is essential, 65.3% correctly recognized that regular menstruation alone does not confirm fertility (Table 1).

3.2 Practices on menstrual hygiene

Among the participants, 37.1% demonstrated poor menstrual hygiene practices, while 62.9% exhibited good practices. The mean practice score was 7.89 ± 1.2, with scores ranging from 5 to 11. All participants reported using sanitary pads during menstruation, with 46% indicating that they changed their pads three times per day. However, only 34.9% reported changing their pads while at school. Regarding storage, 63.5% of the respondents stated that they kept their sanitary pads in a clean and protected place. In terms of disposal, 78.1% reported discarding used sanitary pads in the school restroom. A high proportion of participants (98.7%) reported taking a daily bath during menstruation. However, only 25.6% reported cleaning the genital area before bedtime, and just 28.5% used both soap and water for genital hygiene. Almost all participants (99.7%) reported washing their hands after using the toilet, and 99.5% used soap and water after changing sanitary pads. Additionally, 75% of the schoolgirls reported wearing separate underwear during menstruation (Table 2).

Table 1. Response to questions assessing knowledge of MH

Questions	Number (%) of the study sample	
	Yes	No
Menstruation is a disease process*	41 (10.9)	334 (89.1)
Release of a white discharge a few days before menstruation is abnormal*	231 (61.6)	144 (38.4)
Menstruation is bleeding from vagina	352 (93.9)	23 (6.1)
Hormones are not the cause of menstruation*	163 (43.5)	212 (56.5)
There is a foul smell during menstruation*	267 (71.2)	108 (28.8)
Menstrual blood is unhygienic*	327 (87.2)	48 (12.7)
Regular menstruation alone will not indicate fertility	243 (65.3)	130 (34.7)
Anemia may be caused by excessive menstrual bleeding	286 (76.3)	89 (23.7)
If menstruation lasts for more than 8 days, should see a doctor	316 (84.3)	59 (15.7)
Must consume sea food during menstruation*	285 (76.0)	90 (24.0)
Poor menstrual hygiene predisposes to infection	325 (86.7)	50 (13.3)
Personal hygiene prevents menstrual pain	304 (81.1)	71 (18.9)
Genitalia should be washed frequently	361 (96.3)	14 (3.7)
Pads should be changed frequently	366 (97.6)	9 (2.4)

*(1) The correct answer to the * denoted questions is "No"*

Table 2. Response to questions assessing practices of MH

Questions	Number (%) of the study sample	
	Yes	No
Change pads in school	131 (35.0)	244 (65.0)
Store pads in a clean and covered place	238 (63.5)	137 (36.5)
Throw pads into the latrine	293 (78.1)	82 (21.9)
Bathed daily	370 (98.7)	5 (1.3)
Clean genitalia before going to sleep	96 (25.6)	279 (74.4)
Clean genitalia only with water	268 (71.5)	107 (28.5)
Wash hands every time while using toilet	374 (99.7)	1 (0.3)
Wash hands with soap and water after changing pads	373 (99.5)	2 (0.5)
Use separate undergarments	280 (74.7)	95 (25.3)

3.3 Correlation between knowledge and practice

The knowledge and the practice of MH was not significantly correlated with each other (Pearson correlation test; r=-0.035, p=0.504).

3.4 Correlation between Socio-demographic factors with knowledge and practice

3.4.1 Socio-demographic profile of the study population

A total of 375 female students participated in the study, all aged between 14 and 16 years, with a mean age of 14.98 ± 0.8 years. The majority of participants were in Grade 10. The reported age at menarche ranged from 10 to 16 years, with a mean of 12.82 ± 1.0 years (Table 3). The duration of menstrual flow varied from 2 to 11 days, with a mean duration of 5.41 ± 1.3 days. Additionally, 205 participants (54.7%) reported having menstrual cycles shorter than 28 days.

3.4.2 Correlation between Socio-demographic factors with knowledge and practice

Out of all the tested socio-demographic factors, the adolescent schoolgirls who had taken the

health and physical education subject surprisingly had a significantly lower menstrual hygiene knowledge (OR=0.377, p=0.005). The good MH knowledge was significantly associated with while the adolescent schoolgirls with had good menstrual hygiene practices when compared to others (OR=1.770, p=0.046). Other socio-demographic factors tested were not significantly related to the knowledge and the attitude.

Table 3. Socio-demographic factors associated with knowledge score and practice score

Parameter	Number (Percentage)	High knowledge score			High practice score		
		OR	95% CI	p-value	OR	95% CI	p-value
Age (years)							
14	125 (33.2)	1.000	-	-	1.000	-	-
15	131 (35.0)	0.809	0.468, 1.399	0.448	1.676	0.963, 2.915	0.068
16	119 (31.6)	0.811	0.464, 1.418	0.463	1.770	1.003, 3.126	***0.049**
Educational status of mother							
No education/primary education	36 (9.6)	1.000	-	-	1.000	-	-
Up to secondary education	159 (42.4)	0.739	0.309, 1.767	0.496	0.857	0.345, 2.127	0.739
Up to tertiary education	144 (38.4)	1.266	0.506, 3.166	0.614	0.989	0.380, 2.573	0.983
Higher education	36 (9.6)	0.961	0.216, 4.282	0.959	0.724	0.159, 3.304	0.677
Educational status of father							
No education/primary education	39 (10.4)	1.000	-	-	1.000	-	-
Up to secondary education	178 (47.5)	1.228	0.530, 2.844	0.632	1.062	0.442, 2.549	0.894
Up to tertiary education	131 (34.9)	1.390	0.563, 3.431	0.475	0.775	0.303, 1.979	0.594
Higher education	27 (7.2)	1.054	0.249, 4.465	0.943	0.546	0.128, 2.333	0.414
Occupation of mother							
Housewife	239 (63.7)	1.000	-	-	1.000	-	-
Teacher	31 (8.3)	0.540	0.170, 1.709	0.294	2.144	0.655, 7.013	0.207
Health care professionals	11 (2.9)	0.388	0.103, 1.462	0.162	0.795	0.220, 2.875	0.727
Others	94 (25.1)	0.598	0.351, 1.019	0.059	0.546	0.751, 2.240	0.351
Occupation of father							
Skilled workers	157 (41.9)	1.000	-	-	1.000	-	-
Agriculture or fisheries	52 (13.9)	0.871	0.448, 1.694	0.684	1.668	0.835, 3.334	0.148
Businessman	53 (14.1)	0.933	0.443, 1.969	0.856	0.960	0.458, 2.012	0.914
Others	113 (30.1)	1.037	0.586, 1.832	0.902	1.551	0.857, 2.807	0.147
Monthly income (LKR)							
< 10,000	130 (34.7)	1.000	-	-	1.000	-	-
10,000 – 39,999	163 (43.5)	1.252	0.756, 2.073	0.383	0.914	0.835, 3.334	0.148
> 39,999	82 (21.8)	1.832	0.808, 4.155	0.147	1.007	0.458, 2.012	0.914
Having a sister							
No	112 (29.9)	1.000	-	-	1.000	-	-
Yes	263 (70.1)	0.858	0.535, 1.376	0.524	1.010	0.628, 1.624	0.968
Health and physical science as a subject							
No	57 (15.2)	1.000	-	-	1.000	-	-
Yes	318 (84.8)	0.377	0.192, 0.739	***0.005**	1.104	0.575, 2.122	0.766

In the current study, 54.1% had good knowledge while 62.9% had good MH. Similar results have been observed in other studies conducted among comparable cultures; an Indian study shows that 51.3% of participants had strong understanding of MH, whereas 48.7% had low knowledge (Tamphasana et al. 2020). However, 80.5% of the adolescent schoolgirls in different research conducted in Sri Lanka's Batticaloa district reported having strong understanding (Sujirtha et al. 2017). The current study's 62.9% good practice rate on MH was comparable to that of the Batticaloa study (Sujirtha et al. 2017), which found that 57% of participants had good practices.

The average age of menarche in this study was 12.8 years, which was in line with Dasgupta and Sarkar et al.'s (2008) findings. A slightly higher mean age at menarche, 13.1 years, was reported in a different study (Sujirtha et al. 2017) that was carried out in the Kattankudy area of Batticaloa District, Sri Lanka. The article confirms Deo & Ghattargi's findings, which show that the age at menarche has decreased in the majority of developing nations and has stabilized at 13±0.5 years, with very little variations among nations (Deo & Ghattargi 2005).

While 89.1% of participants in this survey agreed that menstruation was a physiological process, other studies carried out in India (Yasmin et al. 2013; Tamphasana et al. 2020) reveal that only 86.2% and 72.8% of participants agreed that menstruation was a physiological process. According to studies conducted at Andhra Pradesh University and Kolkata Medical College in India (Drakshayani & Ramaiah 1994; Yasmin et al. 2013), 78.5% and 63.3% of the students, respectively, were aware that the vagina was the source of monthly bleeding. The current study found that it was 93.9%.

In the present study, 97% of participants were aware that using sanitary pads is healthier than using cloth. This finding aligns with previous research, where more than 85% of school-aged girls in Haryana, India (Drakshayani & Ramaiah 1994), and Kano, Northwestern Nigeria (Lawan et al, 2010) reported similar awareness. Additionally, 87% of respondents recognized that poor menstrual hygiene increases the risk of illness. In contrast, only 57% of participants in the Kano study (Lawan et al. 2010) were aware of the benefits of sanitary pad use, reflecting regional disparities in menstrual health education. Importantly, the use of cloth sanitary pads, particularly when reused without adequate washing, drying, and sun exposure, has been associated with a higher risk of reproductive tract infections, urinary tract infections, and other hygiene-related health problems due to bacterial growth and moisture retention (Balamurugan & Bendigeri 2012; Das et al. 2015). Furthermore, 87.2% of participants in this study perceived menstrual blood as unhygienic, which is higher than the 77.4% reported in a similar study from Manipur, India (Tamphasana et al. 2020), indicating the persistence of negative socio-cultural perceptions surrounding menstruation.

In the present study, 65.3% of participants demonstrated awareness of the relationship between the menstrual cycle and fertility. This is notably higher than the 48.9% reported in a study conducted in Gujarat, India (Mitra et al. 2015). Additionally, 76.3% of respondents in this study recognized the increased risk of anaemia due to blood loss during menstruation, compared to only 17.5% in the same Gujarat study. Furthermore, 84.3% of participants agreed that medical consultation is necessary if menstruation persists for more than eight days. This level of awareness contrasts sharply with findings from previous regional studies, where only 5.3% and 7% of respondents reported seeking medical advice under similar conditions (Singh et al. 1999; Busari 2012).

Interestingly, the present study found no statistically significant association between parental education (both mother and father) and participants' knowledge of menstrual hygiene (MH). This contrasts with findings from a study in West Bengal, India, where higher maternal education was significantly associated with better menstrual knowledge among students, with an adjusted odds ratio of 2.3 (95% CI: 1.06–5.01) (Sudeeshna & Aparajita 2012). These findings highlight regional and contextual differences in menstrual health awareness and the potential influence of parental education.

According to the current study, all adolescent schoolgirls utilized sanitary pads. This greatly exceeds what has so far been reported in the previous research done in other countries as well as in Sri Lanka: 66.7% of women in West Bengal, India (Pandit et al. 2014), 93.8% of women in Nigeria (Patil & Udgiri 2016), and 90.8% of women in Kattankudy, Batticaloa, Sri Lanka (Sujirtha et al. 2017) reported using sanitary pads. This potentially demonstrates how adolescent schoolgirls are adopting better hygiene practices with global modernization. Nevertheless, in contrast to the current study, 62.6% of the girls in the West Bengal, India, used "only cloth" as a menstrual absorbent (Sudeeshna & Aparajita 2012). According to Arudpragasam (2018) and Team Kin (2023), in Sri Lanka only 30% of the women have access to disposable sanitary pads.

Although the frequency of changing menstrual absorbents varies among individuals, it is generally recommended that they be changed at least 3 to 5 times per day to maintain proper hygiene (Ali & Rizvi 2010). In the present study, 81.1% of participants adhered to this guideline. However, significantly lower frequencies were reported among adolescent schoolgirls in the Batticaloa District, Sri Lanka, where fewer than 50% changed their sanitary pads at least three times daily (Sujirtha et al. 2017). Additionally, 1.3% of respondents in the current study did not bathe daily during menstruation, indicating suboptimal menstrual hygiene (MH) practices. In contrast, a study conducted in Nepal reported that 96% of participants bathed daily during menstruation (Adhikari 2007). That same study also revealed that some girls refrained from brushing their teeth, washing, or combing their hair during menstruation due to cultural restrictions and traditional beliefs, where menstruation is often perceived as a taboo (Adhikari, 2007).

The location of menstruation absorbent material storage is crucial, and research shows that girls typically conceal their absorbent in unsanitary areas in order to preserve their privacy (Omidvar & Begum 2011; Javalkar & Akshaya 2017). Over one-third (36.5%) of the participants in our study kept their pads in dirty, unprotected locations. Analogous reports from India indicate that 19.6% (Yasmin et al. 2013) and 27.6% (Seenivasan et al. 2016) of respondents kept their pads in dirty, exposed locations. On the other hand, a majority of women (99.1%) in an urban area in Delhi, India was storing soakage materials in a suitable manner (Goel et al. 2018). 21.9% of the female participants in the present study disposed of their used sanitary pads in the restroom. Several

studies have also confirmed this observation: 10.8% in the Nepalese Kailali district (Hamal & Susma 2014), 12.2% in North Chennai, India (Seenivasan et al. 2016), and 16.5% in Benin City, Nigeria (Gharoro 2013).

However, in contrast to these results, 97.7% of the study population in the Hhohho Region of Swaziland threw sanitary pads into the latrine (Murye & Mamba 2017). In a Delhi metropolitan area, 100% of subjects said that the soakage material was disposed of satisfactorily (Goel et al. 2018). Modern disposable MH materials are frequently used in high-income metropolitan areas, where disposal typically takes place through a centralized solid waste management system (Ashley et al. 2005). In low-income metropolitan areas, however, a variety of disposal methods are used, such as burning, burying, placing in the trash, pit latrines, or flushing. Waterway contamination and clogged latrines can be caused by inadequate waste disposal systems and a lack of understanding about menstruation absorbent disposal methods (Water Aid 2009).

According to the present study, 71.5% of people used only water for cleaning, while 28.5% used soap and water. Sujirtha et al. (2017)'s study in Sri Lanka found that 58% of the girls in the study utilized soap and water. In an Indian study, 97.5% of girls used soap and water to clean their external genitalia (Tamphasana et al. 2020). On the other hand, it was just 11.3% in a research project conducted in Nepal (Adhikari 2007). 34.9% of children changed their absorbents in school, according to this survey. Pandit et al. (2014) and Omidvar and Begum (2011) also made similar observations. In the current study, only 40% of the girls reported using proper personal hygiene during their periods. Other similar studies from India reveals 28% (Tamphasana et al. 2020) and 22% (Omidvar & Begum 2011; Verma et al. 2013) of the study participants were practicing good personal hygiene.

The current study shows that there is no statistically significant association between the grades, monthly family income, education and occupation of the mother and father with the total MH knowledge. A study conducted in Karnataka, India revealed that the education of parents did not have a significant association with the total practice score (Asif Khan 2012). In a study conducted in Amhara Province, Ethiopia (Teklemariam 2014) the higher educational status of the mother (AOR=95%Cl: [1.15-13.95]) and higher knowledge on MH was significantly associated. Furthermore, the current study demonstrates that there is no discernible relationship between MH knowledge and behaviors, suggesting that MH cannot be improved by information alone. Unexpectedly, the students who took the health and physical education course had less knowledge, which suggests that the course would not have supplied a substantial amount of instruction on menstrual health. Furthermore, older students in the current study showed greater MH (90.8% of the 16-17 aged; p=0.049), suggesting that exposure over time enhances the adoption of better practices, most likely as a result of personal experience.

4 CONCLUSIONS & RECOMMENDATIONS

This study involving 375 adolescent schoolgirls in the Kilinochchi District found that 54.1% demonstrated good knowledge of menstruation, while 62.9% practiced good menstrual hygiene, with mean knowledge and practice scores of 10.29 ± 1.59 and 7.89 ± 1.2, respectively. Despite high awareness of key hygiene practices, such as regular pad changing (96.3%) and genital washing (97.6%), only 28.5% reported using both soap and water, and just 34.9% changed pads at school, indicating gaps between knowledge and behavior. Statistical analysis showed no significant correlation between knowledge and hygiene practices ($r = -0.035$, $p = 0.504$), leading to the rejection of the first hypothesis that higher menstrual knowledge is associated with better hygiene practices. Additionally, most socio-demographic variables were not significantly associated with knowledge or practice, though students who had taken health and physical education scored significantly lower in menstrual knowledge (OR = 0.377, $p = 0.005$), and those with good hygiene practices showed slightly higher knowledge levels (OR = 1.770, $p = 0.046$). These findings offer partial support for the second hypothesis, suggesting that certain environmental and institutional factors, rather than broad socioeconomic status, may influence menstrual health outcomes.

In the light of these findings, we recommend revising school health curricula to emphasize both practical and theoretical aspects of menstrual health, improving school sanitation facilities to support hygiene practices, and launching community-based awareness programs to combat stigma. Menstrual literacy campaigns through youth-friendly media and ongoing research into broader ecological influences are also essential for promoting sustainable menstrual hygiene management in resource-limited settings.

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