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Menstrual Hygiene Among Teenage Girls: Knowledge, Practices, Barriers and Health Outcomes in Nawabshah, Pakistan

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ABSTRACT

Background: Adolescent girls face major menstrual hygiene challenges due to limited awareness, poor sanitation, cultural restrictions, and scarce resources in Pakistan, leading to unhygienic practices, stress, school absenteeism, and inadequate support during menarche. **Objective:** This study aimed to assess adolescents' knowledge, attitudes, and practices regarding menstrual hygiene, and to explore socioeconomic, cultural, and infrastructural factors influencing their behavior. A secondary objective was to determine the association between menstrual knowledge and hygienic practices. **Methods:** The study is cross-sectional descriptive study with six months in Maternal and Child Health Department at PUMHSW, Nawabshah. Stratified random sampling was used to recruit three hundred girls between age 12 and 19 years. A structured questionnaire was used to gather data by addressing the demographic, knowledge of menstruation, hygiene behavior, cultural norms, and perceived barriers. The correlation between knowledge and hygiene practices was analyzed using descriptive statistics and Pearson correlation. **Results:** The average age of the participants was 15.6. Only a quarter of them showed proper menstrual knowledge. The use of sanitary pads was found to be at 58% with 28% depending on cloth. Almost half replaced its absorbent less than three times a day. Absenteeism by school during menstruating occurred in 39%. Affordability, privacy, school sanitation, and cultural limitations were among the major barriers. The more menstrual knowledge, the better hygiene practices ($r = 0.41$, $p < 0.05$). **Conclusion:** Major discrepancies in menstrual hygiene knowledge and practices by adolescent girls are evident in Nawabshah. Completing schooling, lowering the price of menstrual supplies, enhancing sanitation facilities and tackling cultural taboos will be key to improving menstrual health and physical well-being.

INTRODUCTION

The wellbeing of teenage girls is largely MENstrual health, which affects self-esteem, comfort, academic involvement, and the overall quality of life (Shin, Jeon, and Cho, 2022; Li, Bellis, Girling, Jayasinghe, Grover, Marino, and Peate, 2020). Menstruation is a biological process that is regulated by hormones and that has an average cycle of twenty eight days, though the ranges of twenty one to thirty eight are normal (Itriyeva, 2022; Schmalenberger et al., 2021; Pierson, Althoff, Thomas, Hillard, and Leskovec, 2021). Menstruation remains a secret surrounded in misconceptions and stigma even in most low-income environments, including in Pakistan, despite its universality (Tiwana & Raheel, 2023). These societal norms limit the process through which girls handle menstruation with confidence and self dignity.

The adolescence is a period of development which is marked by marked physical and emotional changes. One of the most important milestones is menarche, although various studies across South Asia have shown that most girls in the country experience the first menstrual period without appropriate knowledge and preparation (Gold-Watts, Hovdenak, Daniel, Gandhimathi, Sudha, & Bastien, 2020; Maqbool, Maqbool, Zehravi, and Ara, 2022). Such lack of information can result in anxiety, fear and embarrassment, which forces girls to use the sources of information that are informal and often inappropriate.

The world has become increasingly aware of the necessity to increase the control over menstrual hygiene, yet many problems remain (Patel et al., 2022; Sommer et al., 2021). According to the 2024 global review by UNICEF, over five hundred million girls and women are estimated to be without access to necessary facilities of menstrual hygiene, which includes private latrines, clean absorbents, water, and soap (Nagar, 2024). Such practices related to poor menstrual hygiene are linked to heightened risk of reproductive tract infection, urinary tract infection, and major impairments in school attendance (Nabwera et al.,

2021; Shah et al., 2022; Chidakwa, 2024).

Menstrual in Pakistan is a social health issue. According to the report by UNFPA Pakistan in 2024, almost fifty percent of adolescent girls lack access to basic resources needed to manage menstruation (Ashraf, Shahzad, Sequeria, Bashir, and Azmat, 2024; Aziz, Memon, Aziz, Memon, Khowaja, and Naeem Zafar, 2024; Proff, Fatima, and Limón, 2023). The lack of communication in the family, especially communication between parents and daughters, supports harmful stereotypes, such as the idea that menstruation is dirty, embarrassing, or even evil. These myths add to behavior constraints- including bans on engaging in household chores or religious practices- which have a harmful impact on the emotional wellbeing of the girls.

The financial issues only make menstrual hygiene management more complicated in most families (Rossouw and Ross, 2021; Cohn and Blumberg, 2020; Soeiro, Rocha, Surita, Bahamandes, and Costa, 2021). Commercial sanitary pads are often too expensive to be purchased by low-income families, which encourages the girls to use cloth or homemade absorbents that may not be made in a hygienic manner (Foster and Montgomery, 2021; Parthasarathy, 2022). Lack of proper facilities in schools, including personal washrooms, dependable supply of water and garbage cans, only increases the complication of menstruation, resulting in absenteeism and wastage of school time (Saraswati Palgunadi, Wesnawa, and Sudiana, 2024).

The management of menstrual hygiene is not just about having access to sanitary pads but proper knowledge, availability of low-cost supplies, privacy, availability of safe disposal sources, and the absence of stigma (Ghosh, 2024; Ene et al., 2024). The implementation of menstrual health education in schools and sanitary supplies has been found to substantially increase school enrolment and general health in countries that have incorporated it into school curricula (Austrian, Kangwana, Muthengi, and Soler-Hampejsek, 2021).

However, menstrual hygiene among teenage girls in Pakistan is a under-investigated research area, particularly in semi urban states such as Nawabshah. These areas tend to possess different cultures and different access to sanitary amenities. The research of menstrual hygiene practices in this scenario is critical towards developing interventions that are specific and applicable to certain barrier.

The research was meant to evaluate the knowledge of menstrual hygiene, menstrual hygiene habits, and menstrual hygiene challenges among teen girls in Nawabshah. This study will help policymakers, educators, and other health workers working on improving the menstrual health outcomes among girls by examining both behavioral and contextual factors.

METHODOLOGY

This descriptive cross-sectional research study was carried out in line with strict ethical standards that were adopted by the Institutional Review Board of the People University of Medical and Health Sciences to women. The goal of the investigation was to evaluate the practices of menstrual hygiene and determinants of the same in adolescent girls of Nawabshah. The data was collected in the Maternal and Child Health Department and the participants were selected based on a representative selection of the public and private schools located in urban and urban peri-urban regions to guarantee sufficient socioeconomic diversity. This study was conducted during six months (September 2024- February 2025). The study sample was high school girls aged 12-19 years old who were womenstrually active (had menstruated at least once) and were available at the time of study. The sample size of 300 was set according to the recommendation of the WHO of the school-based research of adolescent health. The stratified random sampling method has been used in which the schools were first stratified according to the type and socioeconomic stratum and then random selection of eligible students in each subject stratum was carried out to improve representativeness and reduce sampling bias. Girls were eligible to take part in case they were between 12 and 19 years of age, had menstruated or could give an informed assent or consent, and parental permission was received; girls who were not yet menstruating, were above the age range or had physical or cognitive reasons not to take part were not eligible.

The survey was conducted by use of structurally developed, interviewer-administered questionnaire based upon standardized menstrual hygiene assessment instruments according to the cultural context, which was pretested and refined. The instrument covered five main areas, such as, sociodemographic characteristics, menstrual knowledge, hygiene related practices, cultural beliefs and perceived barriers. The questionnaire was administered in a private environment by trained female data collectors who have ensured confidentiality and reduced bias concerning response. The ethical protective measures were to retain voluntary involvement, anonymity, and inform the participants about the option of withdrawing without any penalty at any time. The data were keyed and analyzed by the use of SPSS 25. A summary of the characteristics of the participants and significant variables was conducted using descriptive statistics (frequencies, percentages, means). The correlation between hygiene practices and menstrual knowledge was determined using the Pearson correlation coefficient and the significance level was set to $p < 0.05$.

RESULTS

They included 300 adolescent girls with the mean age of 15.6 ± 1.8 years. The sample included various socioeconomic groups where 62, 21, and 17 percent of the sample comprised the middle income, low-income, and higher-income families respectively. Over 55% of the respondents (55) were in the private schools with the other 45% in the public schools.

The level of knowledge about the physiology of menstruation was poor. Only 1/3 of the participants showed sufficient knowledge regarding biological nature of menstruation. Almost half (47%) of them did not know that it is the uterus that sheds menstrual blood, whereas 48% of them did not know the normal period of the menstrual cycle. There were also misconceptions: 37% of them thought that menstruation was a process of cleansing and 12% of them thought that menstruation was an illness.

Menstrual hygiene practice was also different. Participants who used a sanitary pad were found among 58 percent and those who only used cloth among the 28 percent because of financial or availability limitations. An additional 14% had switches between pads and cloth. Practices related to absorbent changing were not optimum with 46% of changing less than three times daily, which is below the recommended standards. Fifty eight percent reported engaging in daily bathing during menstruation and 42 had bathing 2-3 times a week.

There was a significant difference in disposal practices. More than half (54% of disposed menstrual materials) was in domestic waste, 22% buried outdoor, and 15% burned. The small percentage (7percent) flushed absorbents-which introduce sanitary and plumbing hazards. Only 2% of them used proper disposal facilities inside the school premises.

The rate of school absenteeism was also quite significant, as 39 percent said that they had missed at least one school day during their menstrual period. Weaknesses such as fear of leakage, pain or discomfort, lack of sanitation facilities and lack of privacy were given.

Several obstacles affected proper management of menstrual hygiene. Over half (52) indicated high cost of sanitary pads as a major impediment. Absence of special disposal spaces (41%), limited privacy in school washrooms (34%), and culture limitation (60%), were also eminent.

The association between menstrual knowledge and hygiene practices was statistically significant ($r = 0.41$, $p < 0.05$) meaning that the more knowledge a person possessed, the more appropriate the menstrual hygiene practices were.

Table 1

Sociodemographic Characteristics of Participants (N = 300)

Variable	Category	Frequency (n)	%age
Age group (years)	12–14	108	36.0
	15–17	132	44.0
	18–19	60	20.0
School type	Public	135	45.0
	Private	165	55.0
Socioeconomic status	Low income	63	21.0
	Middle income	186	62.0
	High income	51	17.0

Figure 1

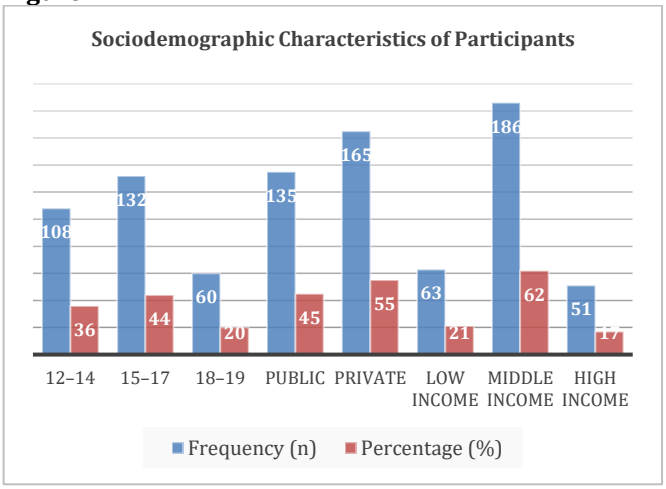


Table 2

Menstrual Knowledge and Misconceptions

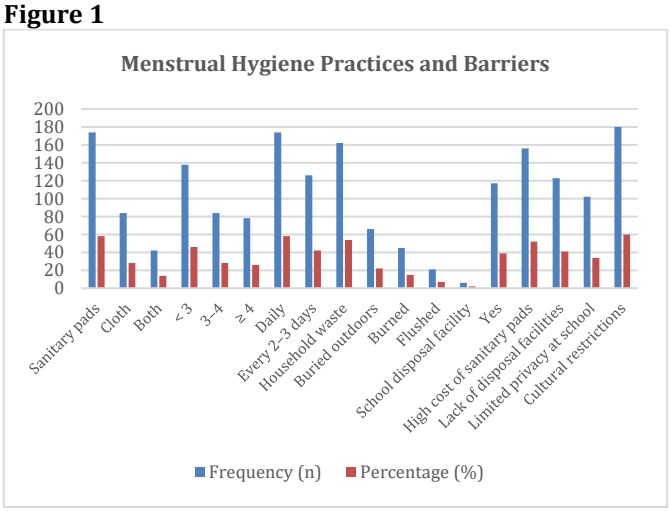
Variable	Category	Frequency (n)	%age
Adequate knowledge of menstrual physiology	Yes	93	31.0
Awareness of origin of menstrual blood	Correct (uterus)	159	53.0
	Incorrect / Don't know	141	47.0
Knowledge of normal cycle length	Correct	156	52.0
	Incorrect / Don't know	144	48.0
Misconceptions	Menstruation is a cleansing mechanism	111	37.0
	Menstruation is an illness	36	12.0

Table 3

Menstrual Hygiene Practices and Barriers

Variable	Category	Frequency (n)	%age
Type of absorbent used	Sanitary pads	174	58.0
	Cloth	84	28.0
	Both	42	14.0
Frequency of absorbent change/day	< 3	138	46.0
	3–4	84	28.0
	≥ 4	78	26.0
Bathing frequency during menstruation	Daily	174	58.0
	Every 2–3 days	126	42.0
Disposal method	Household waste	162	54.0
	Buried outdoors	66	22.0
	Burned	45	15.0
	Flushed	21	7.0
	School disposal facility	6	2.0
School absenteeism	Yes	117	39.0
Barriers	High cost of sanitary pads	156	52.0
	Lack of disposal facilities	123	41.0
	Limited privacy at school	102	34.0
	Cultural restrictions	180	60.0

Figure 1



DISCUSSION

Through a criterion evaluation of menstrual knowledge, hygiene use and context-related obstacles in adolescent girls in Nawabshah, this research paper identifies significant disparities in their menstrual health literacy and demonstrates correlations with wider literature on low- and middle-income contexts. The result of the small percentage of participants who had sufficient knowledge of menstrual physiology compares to researches of India, Nepal and sub-Saharan Africa, where lack of reproductive health education, cultural silence on menstruation and depending on peers over trained teachers, are some of the contributory factors to the prevailing myths. Almost half of

adolescents had minimal knowledge of the biological nature of menstrual blood, which was an indicator of deficient structured educational and less family-based communication on menstrual health. These knowledge gaps contribute to stigmatization, anxiety around the time of menarche and the adoption of safe hygiene practices.

Menstrual hygiene practices amongst the participants portrayed both positive tendencies as well as major gaps. Despite the fact that the proportion of girls using sanitary pads has also risen compared to previous findings in rural Pakistan, over a quarter of girls continued to only use cloth as a method, mainly because of the price and accessibility factors. This is in line with international results that show that economic constraints continue to be one of the most powerful determinants of using safe absorbents. Almost half of the sample was shown to practice suboptimal absorbent-changing behavior that is at risk of reproductive tract infection and discomfort, indicating the multidimensionality of menstrual hygiene, which is not only dependent on the availability of the products but on knowledge, privacy, and environment. The fact that some participants undertake relatively few baths per day during menstruation is also an indication that cultural taboos and resource constraints have a significant impact on the way individuals maintain personal hygiene.

An important issue that has come out as a result of this research is high school absenteeism with nearly 40% of respondents stating that they miss school during menstruation. This number is relative to the global reports of absenteeism rates that report between 25 and 50 percent in resource-constrained situations. Absenteeism factors such as poor sanitary facilities, no disposal alternatives, fear of leakages and painful menstruation explain the structural and psychosocial factors that weaken educational participation among adolescent girls. The lack of dedicated disposal units in schools (98 percent of respondents said so) constitutes an important institutional loophole that contributes to the occurrence of embarrassment, secrecy, and avoidance in schools. These findings are in line with international studies proving that better school hygiene relates to increased school attendance and increased confidence on menstrual management.

One of the strongest barriers has been the cultural restrictions that an impact was felt among 60% of participants. These limitations, household segregations as well as mobility barriers, are indicators of much ingrained sociocultural beliefs that sustain shame and concealment. Other South Asian countries have recorded similar trends, whereby taboos on menstruation have hindered free interaction, and control the freedom of girls in addition to increasing psychological strain. To overcome these cultural limitations, the effective approach is on community-level activities, which encourage communication, break the myths, and allow girls to see menstruating as natural biological events, instead of causes of shame.

Critically, the research found that menstrual knowledge and hygienic practices were significantly positively correlated during which hygienic practices showed that increased awareness directly increase behavior in the world. Those countries, which have incorporated menstrual health education into school curriculum like Kenya, Bangladesh and in some parts of India, have documented significant gains in terms of hygiene practices, school attendance and confidence in menstruation. This association has justified the necessity of institutionalizing menstrual education in Pakistani schools and this requires that the girls be taught in an appropriate by age and culturally sensitive way before menarche and during menarche.

Altogether, the results of the present research provide an insight into the multifactorial character of menstrual hygiene control which is affected by socioeconomic factors, cultural orientations, the quality of infrastructures, and educational exposure. To cope with these issues, it is important to treat the problem in comprehensive, multi-sectoral manner, i.e. to subsidize the sanitary products within the family with low income, to enhance the sanitation and disposal systems at schools, to reinforce the reproductive health education, and to involve the communities to break the taboos. Policymakers and educators can, through prioritising menstrual hygiene as a key element of adolescent health and gender equity, substantially improve the health, dignity and educational prospects of adolescent Pakistani girls.

Limitations

The research has a number of limitations. It was held in one of the districts and this can limit generalizability. It involved self-reported data, thereby subjecting them to the risk of recall bias or biased responses. There could be a cultural sensitivity to menstruation that resulted in some of the experiences being underreported. Regardless of these shortcomings, the research presents helpful background data on health management of menstrual hygiene in semi urban Pakistan.

CONCLUSION

The lack of proper knowledge, culture, economic factors, and inappropriate sanitation facilities have been observed to undermine menstrual hygiene management among the adolescent girls in Nawabshah. These gaps have to be handled through concerted efforts comprising learning institutions, health practitioners, policymakers, and community leaders. Interventions should focus on menstrual literacy, sanitary products access, increased school cleanliness, and loss of negative taboos. Functional menstrual health programs are not only beneficial in enhancing the wellbeing of adolescents, but also gender equity and long-term reproductive health outcomes.

Ethical Approval: Approved by the Institutional Review Board, PUMHSW.

REFERENCES

1. Shin, H., Jeon, S., & Cho, I. (2022). Factors influencing health-related quality of life in adolescent girls: a path analysis using a multi-mediation model. Health and quality of life outcomes, 20(1), 50. https://doi.org/10.1186/s12955-022-01954-6

2. Li, A. D., Bellis, E. K., Girling, J. E., Jayasinghe, Y. L., Grover, S. R., Marino, J. L., & Peate, M. (2020). Unmet needs and experiences of adolescent girls with heavy menstrual bleeding and dysmenorrhea: a qualitative study. Journal of pediatric and adolescent gynecology, 33(3), 278-284. https://doi.org/10.1016/j.jpag.2019.11.007
3. Itriyeva, K. (2022). The normal menstrual cycle. Current problems in pediatric and adolescent health care, 52(5), 101183. https://doi.org/10.1016/j.cppeds.2022.101183
4. Schmalenberger, K. M., Tauseef, H. A., Barone, J. C., Owens, S. A., Lieberman, L., Jarczok, M. N., ... & Eisenlohr-Moul, T. A. (2021). How to study the menstrual cycle: Practical tools and recommendations, Psychoneuroendocrinology, 123, 104895. https://doi.org/10.1016/j.psyneuen.2020.104895
5. Pierson, E., Althoff, T., Thomas, D., Hillard, P., & Leskovec, J. (2021). Daily, weekly, seasonal and menstrual cycles in women's mood, behaviour and vital signs. Nature Human Behaviour, 5(6), 716-725. https://doi.org/10.1038/s41562-020-01046-9
6. Tiwana, P. S., & Raheel, S. (2023). Understanding Knowledge, Attitude, and Practices Regarding Menstruation among Educated Young Adult Females in Urban and Rural Areas of Pakistan. Sociological Research and Innovation, 1(2), 20-36. https://doi.org/10.32350/sri.12.02
7. Gold-Watts, A., Hovdenak, M., Daniel, M., Gandhimathi, S., Sudha, R., & Bastien, S. (2020). A qualitative study of adolescent girls' experiences of menarche and menstruation in rural Tamil Nadu, India. International journal of qualitative studies on health and well-being, 15(1), 1845924. https://doi.org/10.1080/17482631.2020.1845924
8. Maqbool, R., Maqbool, M., Zehravi, M., & Ara, I. (2022). Menstrual distress in females of reproductive age: a literature review. International journal of adolescent medicine and health, 34(2), 11-17. https://doi.org/10.1515/ijamh-2021-0081
9. Sommer, M., Caruso, B. A., Torondel, B., Warren, E. C., Yamakoshi, B., Haver, J., & Phillips-Howard, P. A. (2021). Menstrual hygiene management in schools: midway progress update on the "MHM in Ten" 2014–2024 global agenda. Health Research Policy and Systems, 19(1), 1. https://doi.org/10.1186/s12961-020-00669-8
10. Patel, K., Panda, N., Sahoo, K. C., Saxena, S., Chouhan, N. S., Singh, P., & Panda, B. (2022). A systematic review of menstrual hygiene management (MHM) during humanitarian crises and/or emergencies in low-and middle-income countries. Frontiers in public health, 10, 1018092.
11. Sommer, M., Torondel, B., Hennegan, J., Phillips-Howard, P. A., Mahon, T., Motivans, A., ... & Monitoring Menstrual Health and Hygiene Group. (2021). How addressing menstrual health and hygiene may enable progress across the Sustainable Development Goals. Global health action, 14(1), 1920315. https://doi.org/10.1080/16549716.2021.1920315
12. Nagar, B. B. (2024). A Comparative Review of Environmental Impact of Menstrual Waste Management in Indian and Global Scenarios with a Focus on Single-Use Conventional Sanitary Products. Circular Economy and Sustainable Development: A Necessary Nexus for a Sustainable Future, 517-537. https://doi.org/10.1007/978-3-031-66007-8_28
13. Nabwera, H. M., Shah, V., Neville, R., Sosseh, F., Saidykhan, M., Faal, F., & Torondel, B. (2021). Menstrual hygiene management practices and associated health outcomes among school-going adolescents in rural Gambia. PloS one, 16(2), e0247554. https://doi.org/10.1371/journal.pone.0247554
14. Shah, V., Nabwera, H., Sonko, B., Bajo, F., Faal, F., Saidykhan, M., ... & Torondel, B. (2022). Effects of menstrual health and hygiene on school absenteeism and drop-out among adolescent girls in rural Gambia. International journal of environmental research and public health, 19(6), 3337. https://doi.org/10.3390/ijerph19063337
15. Chidakwa, N. (2024). Menstrual hygiene management among vulnerable rural adolescent schoolgirls in South Africa's rural learning ecologies. Futurity Education, 4(3), 18-41. https://doi.org/10.57125/fed.2024.09.25.02
16. Ashraf, M., Shahzad, S., Sequeria, P., Bashir, A., & Azmat, S. K. (2024). Understanding Challenges Women Face in Flood-Affected Areas to Access Sexual and Reproductive Health Services: A Rapid Assessment from a Disaster-Torn Pakistan. BioMed research international, 2024(1), 1113634. https://doi.org/10.1155/2024/1113634
17. Aziz, A., Memon, S., Aziz, F., Memon, F., Khowaja, B. M. H., & Naeem Zafar, S. (2024). A comparative study of the knowledge and practices related to menstrual hygiene among adolescent girls in urban and rural areas of Sindh, Pakistan: A cross-sectional study. Women's Health, 20, 17455057241231420. https://doi.org/10.1177/17455057241231420
18. Proff, A. A., Fatima, S., & Limón, M. L. S. (2023). Becoming women: period. Perceptions of barriers and facilitators to menstrual hygiene management programs for Pakistani girls. Frontiers in Public Health, 11, 1083688. https://doi.org/10.3389/fpubh.2023.1083688
19. Rossouw, L., & Ross, H. (2021). Understanding period poverty: socio-economic inequalities in menstrual hygiene management in eight low-and middle-income countries. International journal of environmental research and public health, 18(5), 2571. https://doi.org/10.3390/ijerph18052571
20. Cohn, S., & Blumberg, R. L. (2020). Poverty, Water, Sanitation Insecurities, and the Challenges of Maintaining Menstrual Hygiene. In Gender and Development: The Economic Basis of Women's Power (pp. 119-144). SAGE Publications, Inc. https://doi.org/10.4135/9781544381190.n9
21. Soeiro, R. E., Rocha, L., Surita, F. G., Bahamondes, L., & Costa, M. L. (2021). Period poverty: menstrual health hygiene issues among adolescent and young Venezuelan migrant women at the northwestern border of Brazil. Reproductive health, 18(1), 238. https://doi.org/10.1186/s12978-021-01285-7
22. Foster, J., & Montgomery, P. (2021). A study of environmentally friendly menstrual absorbents in the context of social change for adolescent girls in low-and middle-income countries. International journal of environmental research and public health, 18(18), 9766. https://doi.org/10.3390/ijerph18189766
23. Parthasarathy, S. (2022). How sanitary pads came to save the world: Knowing inclusive innovation through science and the marketplace. Social Studies of Science, 52(5), 637-663. https://doi.org/10.1177/03063127221122457
24. Saraswati Palgunadi, N. P. G., Astra Wesnawa, I. G., & Sudiana, I. K. (2024). I Bring Home My Used Menstrual Pad: Water, Sanitation, Hygiene, and Menstrual Hygiene Management in Middle Schools with Limited Sanitation Access. Journal Edunity, 3(11). https://doi.org/10.57096/edunity.v3i11.330
25. Ghosh, S. (2024). Advancing Women's Health and Dignity: A Comprehensive Analysis of Menstrual Health Management and Rights in India. In Law and Emerging Issues (pp. 141-150). Routledge. https://doi.org/10.4324/9781003428213-15

26. Ene, N., Bolarinwa, O. A., Adedigba, C., Oyeleye, J., Boboye, I., Nwosu, U., ... & Okeke, S. R. (2024). "If I use pad, I feel comfortable and safe": a mixed-method analysis of knowledge, attitude, and practice of menstrual hygiene management among in-school adolescent girls in a Nigerian city. BMC Public Health, 24(1), 1721. https://doi.org/10.1186/s12889-024-19256-5

27. Austrian, K., Kangwana, B., Muthengi, E., & Soler-Hampejsek, E. (2021). Effects of sanitary pad distribution and reproductive health education on upper primary school attendance and reproductive health knowledge and attitudes in Kenya: a cluster randomized controlled trial. Reproductive health, 18(1), 179. https://doi.org/10.1186/s12978-021-01223-7