

ORIGINAL ARTICLE

What Affects Menstrual Hygiene Behaviour of Full-day School Adolescents?

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ABSTRACT

Introduction: Because of full-day school system, adolescents spend more time at school than at home. A tight school schedule likely make school female adolescents neglect menstrual hygiene management; consequently, some reproductive health problems might arise. This study analyzed whether knowledge, attitudes, beliefs, availability of facilities, availability of information, and social support are correlated with menstrual hygiene behaviour of full-day school adolescents. **Methods:** This study used a correlation analysis with a cross sectional approach. It was conducted at a junior high school in Surabaya. Randomly elected as samples, 139 adolescents filled out questionnaires. Data were analyzed using the Spearman's rho test. **Results:** Knowledge ($p = 0.000$), attitudes ($p = 0.003$), beliefs ($p = 0.000$), availability of facilities ($p = 0.001$), availability of information ($p = 0.000$) and social support ($p = 0.004$) were associated with menstrual hygiene behaviour of full-day school adolescents. **Conclusion:** Knowledge, attitudes, beliefs, availability of facilities, availability of information and social support are related to menstrual hygiene behaviour of full-day school adolescents. Adolescents could possess menstrual hygiene behaviour as they have good knowledge, positive attitudes, and beliefs. Availability of facilities and information are also factors that support menstrual hygiene behaviour. Social support from parents, teachers, and peers prominently encourages adolescents to keep practicing menstrual hygiene behaviour while being at school.

Keywords: Adolescents; Schools; Behaviour; Menstrual hygiene; Reproductive health

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INTRODUCTION

The implementation of the full-day school system by the Indonesian government has caused adolescents to spend more time at school than at home (1). Adolescents spend about 8 to 9 hours at school a day (2). Most of them forget to change their sanitary pads because of their tight schedules at school (3). Education about adolescents' reproductive health is still not fully integrated into school curriculums in Indonesia (4). Adolescents are only taught about the reproductive process. Practical and theoretical lessons in regards to menstrual issues are not commonly given (5). Millions of women across the world experience reproductive tract

infections, pelvic inflammatory diseases, and urinary tract diseases because they do not apply the practice of good menstrual hygiene (6).

The Indonesian Demographic and Health Survey reported that 25% of adolescent girls had not discussed menstruation with anyone before menarche and 17% did not know that menstruation is a physical sign of puberty (7). The prevalence of reproductive tract infections ranges from 17% to 44% among women across the world (8). Young women in developing countries occupy the highest incidence of reproductive tract infections, which are the second most prevalent public health problem (8).

In 2016, the Indonesian Ministry of Education and Culture reported that in more than 190,000 public schools in Indonesia, only one-fifth of the school toilets worked well (10). Access and facilities are needed by

adolescents to perform menstrual hygiene at school optimally. Most schools in developing countries, especially in rural areas, still have inadequate facilities to support the management of adolescent menstrual hygiene (10, 11).

This research used a conceptual framework that refers to Lawrence Green's Precede Proceed theory. This is based on this theory that examines the problem of human behavior and the factors that influence it and how to follow up by trying to change, maintain, or improve the behavior in a more positive direction. Lawrence Green's Precede Proceed theory consists of predisposing factors which include knowledge, attitudes, and beliefs, enabling factors which include the availability of facilities and sources of information, and reinforcing factors which include social support from the surrounding environment (13). These factors explain that adolescent menstrual hygiene behavior in schools is not only influenced by internal factors but also influenced by external factors or environmental factors. From this theory, it can be concluded that the mechanism for the formation of adolescent menstrual hygiene behavior is influenced by three factors, namely predisposing factors, enabling factors, and reinforcing factors. Many studies related to menstrual hygiene behaviour have been done. However, previous studies have not specifically discussed the factors which can affect the behaviour of adolescents in maintaining menstrual hygiene during school, especially in schools implementing the full-day school system. The purpose of this study was to analyze the relationship between knowledge, attitudes, beliefs, availability of facilities, availability of information, and social support with the behaviour of menstrual hygiene among full-day adolescent students.

MATERIALS AND METHODS

This was a cross-sectional study involving 139 adolescents from a public junior high school in Surabaya. The sampling method applied was simple random sampling. The independent variables in this study were adolescents' knowledge, attitudes, beliefs, availability of facilities, availability of information, and social support. The dependent variable in this study was menstrual hygiene behaviour. The study was conducted in March 2020. Research respondents in this study were 7th and 8th grade students at a public junior high school in Surabaya. The inclusion criteria in this study consisted of (1) adolescents that are already experiencing menstruation (2) adolescents who were willing to become respondents. The exclusion criteria in this study included (1) adolescents who did not fully complete the research questionnaire (2) adolescents who were absent during the survey. A characteristic questionnaire was used to give an overview of respondents' identities, including their age, age of menarche, and grade.

The knowledge questionnaire contained nine closed-ended statements where numerical responses were divided into two categories, namely favourable (1, 2, 7, 8) and unfavourable (3, 4, 5, 6, 9). All items on the questionnaire had good validity scores, and the reliability testing had a Cronbach's α score of 0.814. The adolescents' attitude questionnaire contained five statements related to adolescent attitudes in performing menstrual hygiene. The statement was divided into two types, namely favourable (1, 2, 5) and unfavourable (3, 4). The reliability of the adolescent attitude questionnaire had a Cronbach's α score of 0.749, which indicated good reliability. The adolescents' beliefs questionnaire contained five questions related to adolescent beliefs in performing menstrual hygiene. The reliability testing had a Cronbach's α score of 0.801, which indicated good reliability. The availability of facilities questionnaire contained four questions related to the availability of facilities and environmental conditions that support adolescent in practicing menstrual hygiene at school. The questionnaire was designed by the researchers, but still referred to Lawrence Green's PRECEDE-PROCEED theory. All items on the questionnaire had good validity scores, and the reliability testing had a Cronbach's α score of 0.717, which indicated good reliability. The availability of information questionnaire contained six questions related to access to information about menstrual hygiene obtained by adolescents. The questionnaire was designed by the researchers, but still referred to Lawrence Green's PRECEDE-PROCEED theory. All items on the questionnaire had good validity scores, and the reliability testing had a Cronbach's α score of 0.775, which indicated good reliability. The social support questionnaire contained six questions related to the social support that adolescents perceive from people and their environment in performing menstrual hygiene. The questionnaire was designed by the researchers, but still referred to Lawrence Green's PRECEDE-PROCEED theory. All items on the questionnaire had a good validity scores and the reliability testing had a Cronbach's α score of 0.817, which indicated very good reliability. The menstrual hygiene behaviour questionnaire contained ten statements about adolescent menstrual hygiene behaviour. Menstrual hygiene behaviour questionnaire was divided into two groups, namely favourable (1, 3, 4, 5, 9, 10), and unfavourable (2, 6, 7, 8). All items on the questionnaire had good validity scores and the reliability testing had a Cronbach's α score of 0.835, which indicated very good reliability.

The results of the data obtained were then analyzed using descriptive analysis and bivariate analysis. The descriptive data analysis was used to determine the percentage and frequency distribution. Bivariate analysis was used to determine the relationship between variables. The bivariate analysis in this study used the Spearman correlation analysis with $\alpha = 0.05$.

RESULT

The majority of adolescents were 13 years old (49.6%), More than half of adolescents (79.1%) had experienced menarche between 9 and 12 years of age. The majority of adolescents were in the 8th grade (51.1%) (Table I). The majority of respondents had good knowledge about menstrual hygiene. Lack of knowledge was exhibited in the incorrect answers related to the proper direction of washing genitals (Table II). More than half of respondents had positive attitudes towards menstrual hygiene evidenced by their answers strongly agreeing with statements about the importance of washing hands before washing genitals (Table II).

Table I. Adolescents characteristics. (N=139)

Characteristics		f	%
Age	12 years	7	5.0
	13 years	69	49.6
	14 years	59	42.4
	15 years	4	2.9
	16 years	0	0
Age of menarche	9-12 years	110	79.1
	13-14 years	27	19.4
	>14 years	2	1.4
Grade	7th	68	48.9
	8th	71	51.1

Table II. Item Analysis of Factors Affecting Menstrual Hygiene Behavior (N=139)

Variable	f	%
Knowledge		
Knowing the impact of poor menstrual hygiene	79	56.8
Knowing how to store sanitary pads properly	48	34.5
Knowing how to wash the vagina properly	12	8.6
Attitudes		
Feel the need to apply reproductive organ care during menstruation at school	81	58.3
Preventing the impact of poor menstrual hygiene	58	41.7
Beliefs		
Confident in practicing menstrual hygiene at school	56	40.3
Practicing menstrual hygiene can improve health	83	59.7
Availability of facilities		
Availability of sanitary pads disposal	21	15.1
Availability of clean running water	84	60.4
Availability of soap	34	24.5
Availability of information		
Information about the impact of lack of menstrual hygiene	108	77.7
Information availability in school and media	31	23.3

CONTINUE

Table II. Item Analysis of Factors Affecting Menstrual Hygiene Behavior (N=139) (cont.)

Variable	f	%
Social Support		
Instrumental support for menstrual hygiene facilities	17	12.2
Informational support provided by parents	83	59.7
Encouragement to always practice menstrual hygiene	39	28.1
Menstrual Hygiene Behavior		
Use proper underwear	21	15.1
Use of sanitary pads during menstruation	94	67.6
Conduct health checks when menstrual problems occur	24	17.3

Respondents of this study had good knowledge of and proficiently practiced menstrual hygiene (38.1%). There were some respondents who had good knowledge but practiced poor menstrual hygiene (5.8%). Knowledge was found to have a positive and weak relationship with menstrual hygiene behaviour among adolescents at school ($p = 0.000$). Attitude was found to have a positive and weak correlation with menstrual hygiene behaviour among adolescents at school ($p = 0.003$). The majority of respondents (38.1%) had a positive attitude and performed menstrual hygiene well enough. There were respondents (29.5%) who had negative attitudes but practiced menstrual hygiene quite well. Beliefs were found to have a positive and weak relationship with menstrual hygiene behaviour among respondents ($p = 0.000$). Respondents with beliefs that do not contradict health were found to practice menstrual hygiene quite well (39.6%). Respondents with beliefs opposing health were also found to practice their menstrual hygiene quite well (28.1%) (Table III).

Table III Factors influencing Menstrual Hygiene Behavior (N=139)

Variable	Menstrual Hygiene Behavior						Total	Spearman Rho test		
	Poor		Moderate		Good					
	f	%	f	%	f	%			N	%
Knowledge										
Good	5	3.6	7	5.0	0	0.0	12	8.6	0.000	0.317
Moderate	11	7.9	34	24.5	3	2.2	48	34.5		
Poor	8	5.8	53	38.1	18	12.9	79	56.8		
Attitudes										
Positive	14	10.1	41	29.5	3	2.2	58	41.7	0.003	0.249
Negative	10	7.2	53	38.1	18	12.9	81	58.3		
Beliefs										
Contrary to health behavior	16	11.5	39	28.1	1	0.7	83	59.7	0.000	0.355
Not contradict to health behavior	8	33.3	55	39.6	20	14.4	56	40.3		

CONTINUE

Table III Factors influencing Menstrual Hygiene Behavior (N=139) (cont.)

Variable	Menstrual Hygiene Behavior						Total		Spearman Rho test	
	Poor		Moderate		Good		N	%	p	r
	f	%	f	%	f	%				
Availability of facilities										
Good	12	8.6	21	15.1	1	0.7	34	24.5	0.001	0.286
Moderate	12	8.6	55	39.6	17	12.2	84	60.4		
Poor	0	0.0	18	12.9	3	2.2	21	15.1		
Availability of information										
Exposed	13	9.4	17	12.2	1	0.7	31	22.3	0.000	0.346
Less Exposed	11	7.9	77	55.4	20	14.4	108	77.7		
Social Support										
Good	8	5.8	29	20.9	2	1.4	39	28.1	0.004	0.245
Moderate	15	10.8	57	41.0	11	7.9	83	59.7		
Poor	1	0.7	8	5.8	8	5.8	17	12.2		

The availability of facilities was found to be related to menstrual hygiene behaviour among adolescents at school ($p = 0.001$). The majority of respondents felt the availability of adequate facilities was sufficient enough to support good menstrual hygiene behaviour (39.6%). Health information received by adolescents was found to be related to their menstrual hygiene behaviour at school ($p = 0.000$). The majority of adolescents had exposure to information and practiced moderate menstrual hygiene behaviours (55.4%). Social support was found to be related to menstrual hygiene behaviour among respondents ($p = 0.004$). More than half of adolescents received sufficient social support and practiced moderate menstrual hygiene behaviour (41.0%).

DISCUSSION

Adolescence is a critical period as these are formative years where pubertal, psychological, and behavioural changes take place (14). Problems related to reproductive health are brought about by a lack of information, understanding, and awareness (16, 17). Menstrual hygiene is one component of personal health that plays an important role in an adolescent's health status (17). This research was conducted to determine the determinants of menstrual hygiene behavior using the Precede Proceed theory approach from Lawrence Green. The factors in this theory explain adolescent menstrual hygiene behavior in schools not only influenced by internal factors but also influenced by external factors or environmental factors. The majority of adolescents already understood the theory of menstrual hygiene well, but still did not fully apply these concepts in real situations. This lack of understanding related to the application of menstrual hygiene is due to the information and knowledge provided being limited to theories and definitions of menstrual hygiene. This

is also due to the discussion surrounding menstrual hygiene that is still considered taboo by society. Similar results were obtained by other studies (13, 20) where textbooks and curricula at schools did not discuss much on menstruation topics, causing adolescents to have their knowledge limited to only the biological processes of menstruation.

The lack of latrines and clean water supplies affects menstrual hygiene behaviour and endangers the physical and psychological health of adolescents in schools (5). This lack of facilities causes adolescents to be suboptimal in performing menstrual hygiene even though they have good knowledge of it. The availability of facilities should support adolescents in practicing menstrual hygiene in school, and this includes having sanitary napkins and soap, both of which are still not available.

The majority of respondents already understood that good menstrual hygiene needs to be applied to avoid illness and maintain their health. However, there were still many respondents who thought practicing menstrual hygiene in school is not an important thing. There were still many adolescents who changed their pads only when full. Similar findings were also seen in a study conducted in Nepal and Phillipines (21, 22) where fewer adolescents replaced the sanitary pads every 4 to 6 hours during menstruation.

Inadequate access to menstrual hygiene facilities can cause anxiety and stress, and hinder the ability of adolescents to participate comfortably in school (22). Adolescents' beliefs about menstrual hygiene will affect their performance of it in school because their beliefs affect their way of thinking and will eventually form their behaviour. If an adolescent has a strong belief, then the behaviour formed will be more lasting than an adolescent who has weak or conflicting beliefs.

Adolescents with the right beliefs will have the skills and become accustomed to always maintaining menstrual hygiene (24, 25). Based on the results of the study, adolescents with no conflicting beliefs but had lacking menstrual hygiene behaviours because were the result of little to no exposure to information about and insufficient knowledge of menstrual hygiene. Information and knowledge are also crucial as the basis of adolescents' mindsets to foster beliefs and develop behaviour. Many studies have also concluded that increased knowledge positively affects menstrual hygiene behaviours and reduces negative psychosocial impacts (25).

The majority of adolescents in this study benefitted from the availability of menstrual hygiene facilities in schools to assist them in performing menstrual hygiene. Some adolescents complained that school bathrooms were uncomfortable to use as a place for menstrual hygiene. These findings are comparable with the findings of other

studies (27, 10) where adolescents' schools still did not provide adequate facilities to support adolescents in performing menstrual hygiene. Availability of facilities that support menstrual hygiene at school provide adolescents with the convenience to practice menstrual hygiene outside the home. This is especially true for adolescents attending schools using the full day school system, where more time is spent in school than at home. The majority of adolescents in this study benefited from availability of information to assist them in obtaining information and knowledge about menstrual hygiene. Participants received the most information from social media. There are many positive impacts of social media when viewed through the importance and essential dynamism of online content. The interactive functionalities of social media may also shape what health-related information is accessible to adolescents (27).

In an effort to increase adolescents' knowledge about menstrual hygiene, especially in the school environment, what can be done is intensify the dissemination of information about menstrual hygiene. The physiology of menstruation and its related health issues should also be taught in schools before the age of puberty (28). Incorporating menstrual education into the school curriculum can be a solution to overcome menstrual hygiene problems and contribute to eliminating the taboo related to menstrual hygiene (25).

The support and presence of those closest to adolescents are essential to increase trust and provide strong motivation to adolescents in performing menstrual hygiene. Good relationships and communication between parents and children can increase self-esteem and breed good behavior (30, 31). Support can come in the form of mothers discussing menstrual health with adolescents, such as by always teaching them to change pads and wear comfortable underwear (32, 33).

The results of the present study conform to other findings where mothers of adolescents were identified as their main source of information about menstruation (34, 4). Social support from parents, peers, and teachers will increase sources of information about menstrual hygiene for adolescents. Information is one of the factors that influences a person directly or indirectly in implementing behaviour. The more easily and frequently someone receives and is exposed to information in their environment, the more knowledge they have. Adolescents who receive social support will feel emotionally relieved, get advice, or have positive impressions of themselves. Supportive social support will improve adolescent menstrual hygiene practices.

CONCLUSION

There are many factors affecting adolescents' menstrual hygiene behaviour at school. These factors

consist of internal factors in adolescents and external factors derived from their environment. To apply menstrual hygiene behaviour in school, adolescents need good knowledge, attitudes, and beliefs about menstrual hygiene and how to conduct it properly and appropriately. Schools that provide supporting facilities will make it easier for adolescents to apply menstrual hygiene behaviour while at school. Ease of access to information can also support adolescents in increasing knowledge about menstrual hygiene. Menstrual hygiene behaviours are also reinforced by the social support of parents, peers, and teachers. Besides that, social support obtained can also increase knowledge and shape the attitudes and beliefs of adolescents to perform menstrual hygiene. Adolescents are expected to be more active in digging up information and openly discussing menstrual hygiene with those closest to them to increase their knowledge, attitudes, and self-confidence so that they can apply menstrual hygiene practices properly so as to avoid diseases that attack the reproductive organs. Schools are expected to improve facilities and infrastructure such as the provision of soap in schools to facilitate students in carrying out menstrual hygiene at school. Activities or counseling on reproductive hygiene need to be carried out through learning, extracurricular activities, wall magazines, and UKS activities. The teacher is suggested to be a place for students to discuss about menstrual hygiene because the teacher plays a very important role as a provider of information for students. For health workers, it is necessary to hold health education about reproductive organ health that focuses on how to perform good and proper menstrual hygiene. It is hoped that parents will always provide facilities for carrying out menstrual hygiene, a place for discussion, and also provide information to teenagers so that teenagers can be more confident in implementing menstrual hygiene.

STUDY LIMITATIONS

Due to the outbreak of COVID-19 in the middle of the study, the data collection method used in 8th grade was replaced using Google Form. The majority of students already have personal email and phone. The student who does not have email account to fill out the google form can use the guardian's or parent's email account. This is also explained in the informed consent. In filling out the questionnaire, students also accompanied by parents. The researcher opened open-ended questions and answers if the respondent had difficulties or things they did not understand about the questionnaire.

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REFERENCES

1. Hidayanti M. Implementing Full Day School in Indonesia: "Analysing Impacts on Students, Teachers, and School Stakeholders." *IJAEDU- Int E-Journal Adv Educ.* 2018;IV(10):127–34.
2. Yusuf RA, Mont DF, Lin WH, Chen HJ. Adolescents' Physical Activity and the Association With Perceived Social Support of Parents and Peers in Indonesia. *Asia-Pacific J Public Heal.* 2021;33(4):388–95.
3. Phonna R, Diba F, Yuswardi, Maulina. Efforts to Keep Cleaning when Menstruation Period in Adolescents. *Idea Nurs J.* 2017;IX(2).
4. Suariyani NLP, Kurniati DPY, Widyantini DN, Artha LPW. Reproductive health services for adolescents with hearing impairment in Indonesia: Expectations and reality. *J Prev Med Public Heal [Internet].* 2020 Nov 1 [cited 2021 May 20];53(6):487–91. Available from: [/pmc/articles/PMC7733751/](https://pubmed.ncbi.nlm.nih.gov/37733751/)
5. Gultie T, Hailu D, Workneh Y. Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in amhara province, Ethiopia: Implication to health care workers & school teachers. *PLoS One.* 2014;9(9):1–9.
6. Ameade EPK, Garti HA. Relationship between Female University Students' Knowledge on Menstruation and Their Menstrual Hygiene Practices: A Study in Tamale, Ghana. *Adv Prev Med.* 2016;2016:1–10.
7. SDKI. Survei demografi dan kesehatan Indonesia 2012 (National Survey of Demography and Health). 2012;17. Available from: <http://www.bkkbn.go.id/kependudukan/default.aspx>
8. Sharma D, Naveen GK, Thakare MM. Prevalence of reproductive tract infection symptoms and treatment-seeking behavior among women: A community-based study. *Indian J Sex Transm Dis AIDS.* 2018;39(2):79–83.
9. Durai V, Varadharajan S, Anitha R. Muthuthandavan. Reproductive tract infections in rural India – A population-based study. *J Fam Med Prim Care [Internet].* 2019;6(2):169–70. Available from: <http://www.jfmpc.com/article.asp?issn=2249-4863;year=2017;volume=6;issue=1;spage=169;epage=170;aulast=Faizi>
10. Davis J, Macintyre A, Odagiri M, Suriastini W, Cordova A, Huggett C, et al. Menstrual hygiene management and school absenteeism among adolescent students in Indonesia: evidence from a cross-sectional school-based survey. *Trop Med Int Heal.* 2018;23(12):1350–63.
11. Chinyama J, Chipungu J, Rudd C, Mwale M, Verstraete L, Sikamo C, et al. Menstrual hygiene management in rural schools of Zambia: a descriptive study of knowledge, experiences and challenges faced by schoolgirls. *BMC Public Health [Internet].* 2019;19(1):16. Available from: [http://www.embase.com/search/results?subaction=viewrecord&from=](http://www.embase.com/search/results?subaction=viewrecord&from=export&id=L625815938%0Ahttp://dx.doi.org/10.1186/s12889-018-6360-2)
12. Mucherah W, Thomas K. Reducing barriers to primary school education for girls in rural Kenya: reusable pads' intervention. *Int J Adolesc Med Health.* 2019;31(3).
13. Green LW, Kreuter MW. Health Promotion Planning. An educational and Environmental Approach. 2nd ed. Mountain view: Mayfield Publishing Co.; 1991.
14. Dudeja P, Sindhu A, Shankar P, Gadekar T. A cross-sectional study to assess awareness about menstruation in adolescent girls of an urban slum in western Maharashtra. *Int J Adolesc Med Health.* 2018;30(4):8–12.
15. Chandra-Mouli V, Patel SV. Mapping the knowledge and understanding of menarche, menstrual hygiene and menstrual health among adolescent girls in low- and middle-income countries [Internet]. Vol. 14, *Reproductive Health.* BioMed Central Ltd.; 2017. Available from: <https://pubmed.ncbi.nlm.nih.gov/28249610/>
16. Yufiarti, Nadiroh, Rasminto. Personality and Motivation to Live Healthily in Relation to Understandings of Reproductive Health. *Int J Innov Creat Chang.* 2019;8(4):292–309.
17. Chandar D, Vaishnavi Y, Priyan S, Ganesh Kumar S. Awareness and practices of menstrual hygiene among females of reproductive age in rural Puducherry - A mixed method study. *Int J Adolesc Med Health.* 2018;1–8.
18. Rastogi S, Khanna A, Mathur P. Educational interventions to improve menstrual health: Approaches and challenges. *Int J Adolesc Med Health.* 2019;6–11.
19. Lahme AM, Stern R, Cooper D. Factors impacting on menstrual hygiene and their implications for health promotion. *Glob Health Promot.* 2018;25(1):54–62.
20. Katsuno C, Gregorio ER, Lomboy MFTC, Nonaka D, Hernandez PMR, Estrada CAM, et al. Quality of public school toilets and the frequency of changing sanitary napkins among students in public secondary schools in the City of Manila, Philippines. *Trop Med Health.* 2019;47(1):1–10.
21. Yadav RN, Joshi S, Poudel R, Pandeya P. Knowledge, Attitude, and Practice on Menstrual Hygiene Management among School Adolescents. *J Nepal Health Res Counc [Internet].* 2018 Jan 1;15(3):212–6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/29353891>
22. Morgan C, Bowling M, Bartram J, Lyn Kayser G. Water, sanitation, and hygiene in schools: Status and implications of low coverage in Ethiopia, Kenya, Mozambique, Rwanda, Uganda, and Zambia. *Int J Hyg Environ Health [Internet].* 2017;220(6):950–9. Available from: <http://dx.doi.org/10.1016/j.ijheh.2017.03.015>
23. Kaur R, Kaur K, Kaur R. Menstrual Hygiene,

- Management, and Waste Disposal: Practices and Challenges Faced by Girls/Women of Developing Countries. *J Environ Public Health*. 2018;2018.
24. Shah V, Nabwera HM, Sosseh F, Jallow Y, Comma E, Keita O, et al. A rite of passage: A mixed methodology study about knowledge, perceptions and practices of menstrual hygiene management in rural Gambia. *BMC Public Health* [Internet]. 2019 Mar 7 [cited 2021 May 20];19(1):1–15. Available from: <https://doi.org/10.1186/s12889-019-6599-2>
 25. VanLeeuwen C, Torondel B. Exploring menstrual practices and potential acceptability of reusable menstrual underwear among a middle eastern population living in a refugee setting. *Int J Womens Health*. 2018;10:349–60.
 26. Hennegan J, Sol L. Confidence to manage menstruation at home and at school: findings from a cross-sectional survey of schoolgirls in rural Bangladesh. *Cult Heal Sex* [Internet]. 2019;0(0):1–20. Available from: <https://doi.org/10.1080/13691058.2019.1580768>
 27. Goodyear VA, Armour KM, Wood H. Young people and their engagement with health-related social media: new perspectives. *Sport Educ Soc* [Internet]. 2019 Sep 2 [cited 2021 May 20];24(7):673–88. Available from: <https://www.tandfonline.com/action/journalInformation?journalCode=cses20>
 28. Afsari A, Mirghafourvand M, Valizadeh S, Abbasnezhadeh M, Galshi M, Fatahi S. The effects of educating mothers and girls on the girls' attitudes toward puberty health: A randomized controlled trial. *Int J Adolesc Med Health*. 2015;2015:5–10.
 29. Keizer R, Helmerhorst KOW, van Rijn-van Gelderen L. Perceived Quality of the Mother–Adolescent and Father–Adolescent Attachment Relationship and Adolescents' Self-Esteem. *J Youth Adolesc* [Internet]. 2019 [cited 2021 May 20];48(6):1203. Available from: [/pmc/articles/PMC6525131/](https://pmc/articles/PMC6525131/)
 30. Bireda AD, Pillay J. Perceived parent–child communication and well-being among Ethiopian adolescents. *Int J Adolesc Youth* [Internet]. 2018 Jan 2 [cited 2021 May 20];23(1):109–17. Available from: <https://www.tandfonline.com/action/journalInformation?journalCode=rady20>
 31. Hahn RA, Truman BI. Education improves public health and promotes health equity. *Int J Heal Serv* [Internet]. 2015 Oct 1 [cited 2021 May 20];45(4):657–78. Available from: [/pmc/articles/PMC4691207/](https://pmc/articles/PMC4691207/)
 32. Thomas PA, Liu H, Umberson D. Family Relationships and Well-Being. *Innov Aging* [Internet]. 2017 Nov 1 [cited 2021 May 20];1(3). Available from: [/pmc/articles/PMC5954612/](https://pmc/articles/PMC5954612/)
 33. Sarkar I, Dobe M, Dasgupta A, Basu R, Shahbabu B. Determinants of menstrual hygiene among school going adolescent girls in a rural area of West Bengal. 2017;