



Menstrual Health Literacy in Higher-Education Institutions

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Abstract

Menstrual health can influence physical comfort, psychological well-being, social participation, healthcare use, and educational engagement throughout the reproductive life course. Higher-education institutions are particularly important environments because students must often manage menstruation alongside lectures, examinations, laboratory work, clinical placements, commuting, residential living, employment, and other academic responsibilities. Menstrual health literacy extends beyond basic knowledge of menstrual hygiene. It includes understanding the menstrual cycle, recognizing variation between expected and potentially concerning symptoms, identifying evidence-informed self-management options, knowing when professional assessment may be appropriate, and possessing sufficient confidence to obtain institutional or healthcare support. The 2021 Global Menstrual Collective definition similarly conceptualized menstrual health in physical, mental, and social terms rather than reducing it to hygiene alone.

The simulated analysis indicates progressively stronger menstrual-health literacy as institutional support becomes more comprehensive. Correct recognition of potentially concerning menstrual symptoms increases from 38% in the minimal-support condition to 84% under integrated education and campus support. Mean help-seeking readiness rises from 42.6 to 78.1 on a 0–100 scale, while the modeled proportion reporting substantial academic disruption decreases from 47% to 23%. These hypothetical patterns are consistent with pre-2022 evidence showing that menstrual pain and menstrual distress can interfere with university attendance, concentration, academic performance, clinical learning, and social functioning, while many young people do not seek professional care despite substantial symptoms.

The study argues that higher-education menstrual-health strategies should integrate reliable education with accessible products, appropriate sanitation and privacy, stigma reduction, confidential health-service pathways, and academic policies capable of responding proportionately to significant menstrual symptoms. University-based menstrual-equity research further suggests that sustainable provision requires administrative commitment rather than dependence on temporary student-led initiatives. The paper concludes that menstrual health literacy should be treated as a health-literacy and educational-participation issue rather than a narrow hygiene topic.

Keywords: menstrual health literacy; higher education; university students; dysmenorrhea; menstrual stigma; menstrual equity; health-seeking behavior; academic participation



1. Introduction

Menstruation is a recurring health experience that intersects with physical symptoms, emotional well-being, social participation, personal dignity, and access to appropriate healthcare. Contemporary menstrual-health scholarship has therefore moved beyond a narrow focus on menstrual hygiene. Hennegan and colleagues' 2021 definition describes menstrual health through physical, mental, and social well-being in relation to the menstrual cycle and emphasizes access to information, appropriate materials and facilities, supportive environments, and timely care when required. This wider formulation is particularly relevant to higher education because students may be able to obtain menstrual products yet still lack adequate knowledge concerning their cycle, experience stigma around discussing symptoms, or remain uncertain about when menstrual pain or bleeding patterns deserve professional attention.

University and college environments create distinctive menstrual-management demands. Students may spend long periods in lectures, laboratories, libraries, examinations, field placements, or clinical environments where access to toilets, privacy, medication, rest, products, and opportunities to change menstrual materials can be constrained by schedules. A 2021 systematic review by Munro and colleagues concluded that university students frequently described negative menstrual experiences, particularly in association with dysmenorrhea and menstrual stigma, and that menstruation could negatively affect their education. Studies among nursing students likewise show that menstrual symptoms may interfere with attendance, learning ability, clinical practice, concentration, and everyday functioning. These findings indicate that institutional menstrual health involves both personal health knowledge and the conditions under which students are expected to participate academically.

Dysmenorrhea illustrates why literacy matters. Armour and colleagues' meta-analysis of 38 studies involving 21,573 young women estimated a high prevalence of dysmenorrhea and found substantial educational consequences, including absence from school or university and impaired classroom performance or concentration. Australian national survey evidence similarly associated greater menstrual pain with absenteeism and reduced educational performance across secondary and tertiary settings. Among Irish university students, Durand and colleagues reported a very high prevalence of primary dysmenorrhea and emphasized the need for improved menstrual-pain management and menstrual-health literacy. The concern is not that every painful period represents pathology, but that normalization of disabling symptoms may prevent some students from recognizing when health assessment would be appropriate.

Higher-education institutions therefore represent an important but underused setting for menstrual-health literacy. Universities can provide evidence-informed education, accessible products, appropriate bathrooms, confidential student-health services, referral pathways, and staff policies that allow students to respond to significant symptoms without unnecessary academic disadvantage. Menstrual-equity initiatives documented across United States universities demonstrate both growing institutional interest and the importance of administrative commitment, sustainable resources, and inclusive implementation. The present paper develops a simulation-based framework to examine how progressively stronger institutional support might influence menstrual-health literacy, symptom recognition, help-seeking confidence, and academic participation.



2. Objectives of the Study

2.1 To Examine Menstrual Health Literacy Beyond Basic Hygiene Knowledge

The first objective is to conceptualize menstrual health literacy as a multidimensional competence. The framework includes knowledge of menstrual-cycle processes, understanding of common menstrual experiences, capacity to distinguish manageable symptoms from those that may justify professional assessment, familiarity with evidence-informed self-management options, and knowledge of available healthcare or institutional support. This broader definition reflects contemporary scholarship showing that menstrual health encompasses far more than product use and cleanliness.

A literacy-based approach is particularly appropriate in higher education because students are increasingly expected to make independent healthcare decisions. The relevant question is not only whether a student knows how to manage menstrual bleeding but whether that student can interpret changes, evaluate symptom severity, avoid inappropriate normalization, and confidently communicate concerns to a qualified healthcare professional when necessary. The study therefore separates menstrual-management knowledge from menstrual-health decision literacy.

2.2 To Evaluate the Relationship Between Literacy, Help-Seeking, and Academic Participation

The second objective is to examine whether higher menstrual-health literacy is theoretically associated with stronger help-seeking readiness and lower menstrual-related academic disruption. This pathway is supported by evidence showing that severe menstrual pain can interfere with attendance, concentration, educational achievement, and social participation while many affected young people make limited use of professional healthcare.

The proposed model does not assume that education itself eliminates symptoms. A student with severe dysmenorrhea may remain symptomatic after receiving accurate information. Literacy may nevertheless improve adaptation by supporting appropriate self-management, reducing uncertainty, prompting timely healthcare engagement, and helping students communicate the impact of symptoms to academic or health-service personnel.

2.3 To Develop an Institutional Menstrual-Health Support Framework

The third objective is to identify how higher-education institutions can create environments in which menstrual literacy becomes actionable. The proposed framework combines education with product accessibility, appropriate facilities, stigma reduction, confidential health support, and visible referral pathways. University menstrual-equity initiatives have shown that sustainable product and support programmes depend substantially on institutional commitment, funding, maintenance, and administrative ownership.

Material resources are included because literacy cannot compensate for unavailable products or inadequate facilities. Cardoso and colleagues identified period poverty among college-aged women and found associations with poorer mental-health outcomes, demonstrating that menstrual-health support must account for affordability as well as knowledge. The model therefore treats literacy and institutional capacity as complementary rather than interchangeable.

3. Review of Literature

3.1 Menstrual Health Literacy and Recognition of Menstrual Problems

Holmes and colleagues reviewed menstrual-health literacy research across low-, middle-, and high-income countries and identified continuing deficiencies in menstrual knowledge despite substantial differences in cultural and economic context. Their synthesis highlighted the importance of menstrual education that goes beyond basic biological information and includes symptom recognition and effective management. Hennegan and colleagues' broader menstrual-health framework similarly positions information, confidence, resources, supportive social conditions, and healthcare access as interrelated components of menstrual well-being.

Evidence from young Australian women reinforces the distinction between experiencing symptoms and understanding their significance. Armour and colleagues found that menstrual-health information was frequently obtained from the internet and that many participants did not seek professional advice despite reporting symptoms. Such findings are particularly relevant to universities, where students may have considerable general education yet still possess limited menstrual-health literacy. Academic achievement should therefore not be assumed to correspond automatically with reproductive-health knowledge.

3.2 Menstrual Symptoms, Educational Participation, and Student Experience

Menstrual symptoms can directly interfere with higher-education participation. Armour and colleagues' 2019 systematic review and meta-analysis identified a substantial academic burden associated with dysmenorrhea, including absenteeism and impairment in classroom performance and concentration. Their later Australian national survey showed similar relationships between greater menstrual pain and reduced educational participation among young people at school and in tertiary education.

University-specific studies provide further evidence. Durand and colleagues reported that dysmenorrhea was highly prevalent among university students in Ireland and had important effects on daily and academic life. Tadese and colleagues found dysmenorrhea among graduating female university students in Ethiopia and examined its relationship with academic performance, illustrating that menstrual pain is relevant across different higher-education and socioeconomic settings. Nursing-student studies from Spain have similarly documented absenteeism and substantial interference with daily life and academic participation.

3.3 Stigma, Menstrual Equity, and Institutional Responsibility

Menstrual experience is shaped by social context. Hennegan and colleagues' systematic review and qualitative metasynthesis across low- and middle-income countries found that menstrual stigma and gender norms could restrict knowledge, reduce social support, shape behavioral expectations, and interact with limitations in physical infrastructure and affordable menstrual materials. Although much of that evidence originated outside higher education, its conceptual relevance extends to universities because stigma can continue into adulthood rather than disappearing at school completion.

Casola and colleagues' discussion of menstrual stigma in the United States emphasizes the communication complexities through which menstruation remains hidden or framed as embarrassing. The consequence for health literacy is important: information may technically exist while students



remain reluctant to ask questions, reveal the severity of symptoms, request products, or discuss accommodations. Menstrual literacy therefore requires a communication environment in which asking for clinically relevant information is socially permissible.

4. Research Methodology

4.1 Research Design and Simulated Population

The study adopts a simulation-based explanatory quantitative design. No university students were recruited, no questionnaire was administered, and no medical or academic records were accessed. The simulation is intended to demonstrate how menstrual-health literacy and institutional support could be operationalized in a future empirical higher-education study without fabricating participant observations. A synthetic sample of 640 student profiles was generated and divided equally across four institutional-support environments: minimal support, information access only, structured menstrual-health education, and integrated education plus campus support. Each group contains 160 simulated profiles. These conditions represent increasing institutional intensity rather than real universities or existing intervention programmes.

The minimal-support condition represents settings where menstrual information and support are difficult to locate. Information access represents passive availability of online or printed information. Structured education includes organized evidence-informed menstrual-health learning. The integrated condition combines education with visible health-service navigation, menstrual-product access, appropriate facilities, and an institutional environment designed to reduce barriers to seeking support.

4.2 Construct Operationalization

Menstrual health literacy is modeled on a 0–100 composite scale integrating knowledge, symptom appraisal, self-care understanding, and help-seeking knowledge. The model deliberately excludes a requirement that students memorize highly technical reproductive physiology because health literacy concerns meaningful use of information rather than factual recall alone.

Table 1: Operational Framework for the Simulation

Construct	Proposed Operational Definition	Scale	Analytical Role
Menstrual Health Literacy	Understanding of menstrual processes, symptoms, self-management, and appropriate care pathways	0–100	Primary explanatory variable
Symptom Recognition	Ability to recognize menstrual experiences that may warrant professional discussion	0–100	Primary literacy outcome
Self-Care Confidence	Confidence in selecting appropriate low-risk menstrual self-management strategies	0–100	Secondary outcome



Construct	Proposed Operational Definition	Scale	Analytical Role
Help-Seeking Readiness	Confidence and willingness to obtain appropriate professional support	0–100	Secondary outcome
Perceived Menstrual Stigma	Perceived embarrassment or social discomfort surrounding menstrual disclosure	0–100	Contextual variable
Academic Disruption	Modeled interference with attendance, concentration, coursework, or required activities	Percentage	Primary functional outcome
Institutional Support	Availability of education, products, facilities, health navigation, and stigma-sensitive policies	Four conditions	Environmental exposure

Source: Author-designed simulation framework informed by pre-2022 menstrual-health literacy, university experience, dysmenorrhea, and menstrual-equity research.

The framework does not treat menstrual pain scores as equivalent to literacy. Symptoms and literacy are separate variables. A student may possess excellent menstrual-health knowledge and still experience severe symptoms, whereas another student may report relatively mild symptoms yet lack knowledge concerning appropriate management. This distinction prevents the model from incorrectly implying that menstrual-health education itself prevents dysmenorrhea.

4.3 Simulation and Analytical Procedure

The simulated dataset was specified so that increasingly comprehensive institutional support was associated with higher literacy, stronger recognition of potentially concerning symptoms, greater self-care and help-seeking confidence, and lower perceived stigma. Academic disruption was modeled as influenced by both symptom burden and the capacity to manage or obtain support, rather than by literacy alone.

Descriptive comparison was used instead of inferential statistical testing. Because the dataset was deliberately generated, conventional *p*-values would not provide evidence about a real student population. A future empirical study could use multilevel models with students nested within institutions, allowing institutional facilities and policies to be evaluated separately from student-level knowledge and symptom burden.

An empirical version should also use validated or carefully developed measures and should differentiate primary dysmenorrhea, suspected secondary causes, abnormal bleeding, premenstrual symptoms, product insecurity, and general menstrual-health knowledge rather than collapsing all menstrual experiences into a single category. Clinical diagnoses should be made only by appropriately qualified professionals.

5. Analysis

5.1 Simulated Literacy and Help-Seeking Outcomes

The simulated analysis shows a progressive increase in menstrual-health literacy as institutional support becomes more comprehensive. Mean literacy rises from 44.2 in the minimal-support condition to 81.6 in the integrated-support condition. Help-seeking readiness increases in parallel, from 42.6 to 78.1.

Table 2: Simulated Menstrual-Health Outcomes by Institutional Support

Institutional Support Condition	Simulated Cases	Mean Literacy Index	Correct Symptom Recognition	Mean Help-Seeking Readiness	Substantial Academic Disruption
Minimal Support	160	44.2	38%	42.6	47%
Information Access Only	160	57.8	55%	54.9	40%
Structured Menstrual-Health Education	160	71.3	72%	68.7	31%
Integrated Education + Campus Support	160	81.6	84%	78.1	23%

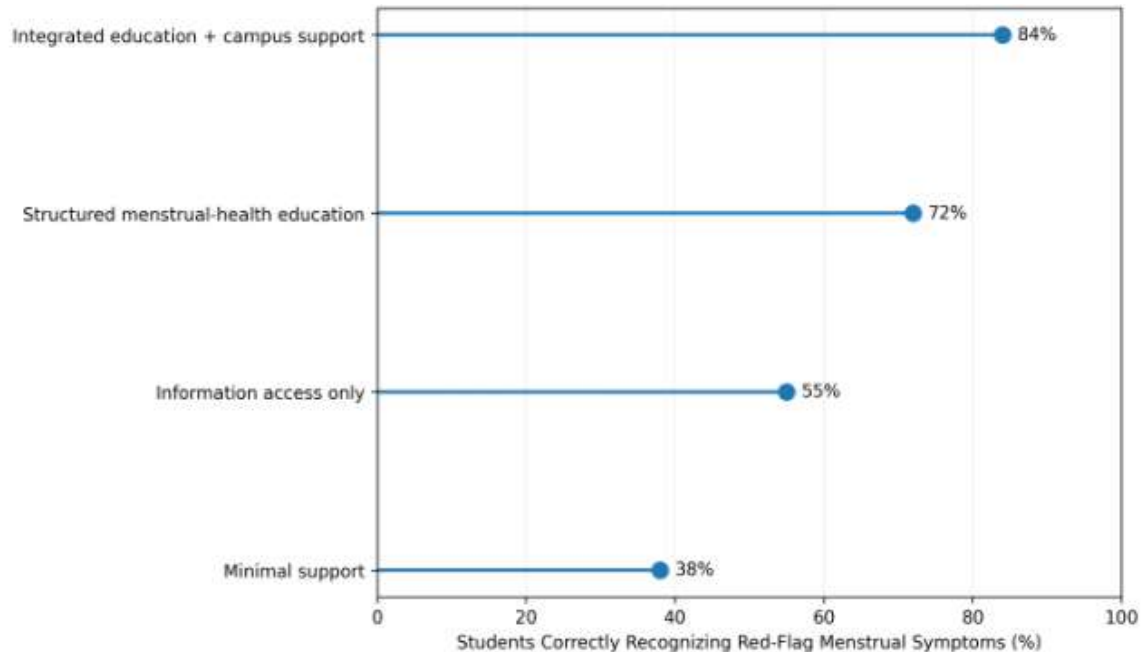
The information-only condition improves outcomes compared with minimal support but produces substantially weaker results than structured education. This pattern represents the theoretical distinction between availability of information and usable health literacy. Students may encounter menstrual information online without knowing whether it is reliable, relevant, or applicable to their particular symptoms.

The integrated condition produces the strongest modeled reduction in academic disruption. The model assumes that knowledge becomes more useful when students can obtain products, access suitable facilities, locate confidential healthcare, and communicate significant difficulties without excessive stigma. This interpretation is consistent with university menstrual-equity and menstrual-experience research emphasizing both resources and institutional environment.

5.2 Recognition of Symptoms That May Require Professional Assessment

The primary graph examines recognition of potentially concerning menstrual symptoms across the four support conditions.

Graph 1: Simulated Recognition of Potentially Concerning Menstrual Symptoms Across Institutional Support Levels



The lollipop graph shows an increase from 38% correct recognition under minimal institutional support to 55% with information access, 72% with structured education, and 84% under the integrated-support model. These values are hypothetical and do not indicate the actual proportion of university students who can recognize menstrual-health concerns.

Key Finding: The modeled benefit of institutional support is not limited to improving factual knowledge. More comprehensive support is associated with greater capacity to interpret menstrual symptoms and identify when professional discussion may be appropriate.

5.3 Menstrual Literacy and Academic Participation

The simulated proportion experiencing substantial menstrual-related academic disruption decreases from 47% under minimal support to 23% under integrated support. The model does not assume that education eliminates menstrual symptoms. Instead, it proposes that knowledgeable students who have access to products, facilities, self-management information, healthcare, and reasonable institutional support may be better able to maintain educational participation.

This pathway is theoretically compatible with existing evidence showing that dysmenorrhea can interfere with attendance, concentration, classroom performance, and university life. It is also compatible with qualitative studies showing that students experiencing menstrual pain actively seek environments in which symptoms can be managed safely and discreetly.

The analysis therefore distinguishes between symptom burden and disability produced by the surrounding environment. Two students with similar pain severity may experience different academic consequences if one has easy access to healthcare, products, rest opportunities, and supportive academic communication while the other does not.

6. Discussion

6.1 Menstrual Health Literacy as a Higher-Education Health Competency

The findings support a broader definition of menstrual literacy in universities. Basic menstrual education often concentrates on cycle biology and hygiene. These topics are necessary but insufficient for young adults making independent health decisions. Students also need to understand symptom variability, evidence-informed management, healthcare pathways, and the difference between a common menstrual experience and one whose severity or impact justifies further assessment.

This conclusion is supported by Armour and colleagues' evidence that many young people use internet information and self-management while relatively few seek professional advice for menstrual symptoms. Durand and colleagues' university study similarly emphasized improved menstrual pain management and menstrual-health literacy. Literacy programmes should therefore improve students' capacity to ask informed questions rather than merely distribute standardized information.

The programme should also communicate uncertainty responsibly. Menstrual symptoms vary substantially among individuals. Universities should not attempt to diagnose students through educational materials, apps, or nonclinical staff. Institutional education should help students recognize when to use qualified health services, while professional assessment remains the appropriate route for diagnosis.

6.2 Educational Participation, Stigma, and the Normalization of Pain

One of the most important institutional challenges is the normalization of significant menstrual pain. Because dysmenorrhea is common, some students may interpret substantial interference with attendance or concentration as something they are simply expected to tolerate. Evidence from the large 2019 meta-analysis, the Australian national survey, and university studies demonstrates that menstrual pain can produce meaningful academic consequences. The fact that a symptom is common does not mean that severe functional impairment should be dismissed.

Stigma can reinforce this normalization. Students may hesitate to tell instructors why they need to leave a laboratory, miss a clinical placement, obtain medication, or request healthcare. Menstrual stigma also encourages euphemistic or secretive communication that can make health education less precise. Casola and colleagues describe menstruation stigma as a communication challenge, while Hennegan and colleagues' metasynthesis demonstrates how stigma can limit knowledge, support, and participation.

Stigma reduction should not require students to disclose private menstrual information publicly. A supportive university is not one in which everyone must discuss menstruation openly; it is one in which those who need information, products, clinical help, or reasonable support can obtain them without shame or unnecessary exposure of personal health information.

6.3 Institutional Design for Menstrual Health and Equity

The simulated results indicate that the integrated-support condition provides stronger outcomes than information access alone. This finding reflects a broader public-health principle: knowledge becomes useful when environments permit people to act on it. A student may understand proper menstrual



management but lack an emergency product on campus. Another may know that persistent disabling pain should be assessed but not know where confidential care can be obtained.

Menstrual-equity initiatives in United States universities demonstrate the importance of administrative support, adequate resourcing, maintenance systems, student involvement, and inclusive implementation. Product availability is particularly relevant because Cardoso and colleagues documented period poverty among college-aged women and found an association between recurring product insecurity and depressive symptoms. Product access should therefore be treated as part of student health infrastructure rather than as a charitable extra.

Campus design should integrate several functions without creating unnecessary bureaucracy. Menstrual products can be available in accessible locations; bathrooms can support safe changing and disposal; student-health services can provide evidence-informed guidance; university websites can clearly explain where to seek confidential help; and academic units can develop proportionate procedures for significant health-related disruption. Students should not need to demonstrate public distress simply to obtain basic menstrual support.

7. Conclusion

Menstrual health literacy in higher education should be understood as the capacity to understand the menstrual cycle, interpret symptoms proportionately, use appropriate self-management strategies, identify when professional healthcare may be needed, and navigate available institutional support. This approach is consistent with the broader 2021 definition of menstrual health as a physical, mental, and social state rather than a hygiene issue alone.

The simulation developed in this study illustrates the potential importance of institutional context. Correct recognition of potentially concerning menstrual symptoms rises from 38% in the minimal-support condition to 84% under integrated education and campus support, while help-seeking readiness improves and substantial academic disruption declines. These values are entirely synthetic and should not be interpreted as observed student outcomes.

The pre-2022 evidence base nevertheless gives the framework a strong empirical rationale. Dysmenorrhea and menstrual distress can affect attendance, concentration, academic performance, clinical learning, social engagement, and quality of life among students, while health-seeking may remain limited despite substantial symptoms. Universities therefore have a legitimate health-promotion role that extends beyond providing toilets or emergency menstrual products.

Future empirical research should compare institutions with different levels of menstrual-health support and measure both student-level literacy and institutional conditions. Appropriate outcomes include symptom recognition, evidence-informed self-care, help-seeking behavior, product insecurity, perceived stigma, attendance, concentration, clinical-placement disruption, healthcare access, and satisfaction with institutional support. The strongest institutional model is likely to be one in which students possess accurate menstrual-health knowledge and have a realistic, private, affordable, and stigma-sensitive way to act on that knowledge when needed.

References

1. Fahs, B., & Swank, E. (2021). Menstrual knowledge and understandings of normal and extreme bleeding: College students' overestimation of the typical amount of menstrual blood. *Women's Reproductive Health*, 8(2), 115–136. <https://doi.org/10.1080/23293691.2021.1901520>
2. Hennegan, J., Shannon, A. K., Rubli, J., Schwab, K. J., & Melendez-Torres, G. J. (2019). Women's and girls' experiences of menstruation in low- and middle-income countries: A systematic review and qualitative meta-synthesis. *PLoS Medicine*, 16(5), e1002800.
3. Hennegan, J., Winkler, I. T., Bobel, C., Keiser, D., Hampton, J., Larsson, G., Chandra-Mouli, V., Plesons, M., & Mahon, T. (2021). Menstrual health: A definition for policy, practice, and research. *Sexual and Reproductive Health Matters*, 29(1), 1911618.
4. van Eijk, A. M., Zulaika, G., Lenchner, M., Mason, L., Sivakami, M., Nyothach, E., Unger, H., Laserson, K., & Phillips-Howard, P. A. (2021). Menstrual hygiene management among adolescent girls and women in low- and middle-income countries: A systematic review and qualitative meta-synthesis. *BMJ Global Health*, 6, e004005.
5. Ameade, E. P. K., & Garti, H. A. (2016). Relationship between female university students' knowledge on menstruation and their menstrual hygiene practices: A study in Tamale, Ghana. *Advances in Preventive Medicine*, 2016, 1056235. <https://doi.org/10.1155/2016/1056235>
6. Szűcs, M., Bitó, T., Csíkos, C., Párducz Szöllősi, A., Furau, C., Blidaru, I., Kapamadzija, A., Sedlecky, K., & Bártfai, G. (2017). Knowledge and attitudes of female university students on menstrual cycle and contraception. *Journal of Obstetrics and Gynaecology*, 37(2), 210–214. <https://doi.org/10.1080/01443615.2016.1229279>
7. Hwang, R. I. (2018). Comparison of menstrual knowledge, attitudes and education needs of male and female university students. *Journal of the Korea Convergence Society*, 9(10), 497–505. <https://doi.org/10.15207/JKCS.2018.9.10.497>
8. Balla, C. P., & Nallapu, S. S. R. (2018). Knowledge, perceptions and practices of menstrual hygiene among degree college students in Guntur city of Andhra Pradesh, India. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*, 7(10), 3989–3995. <https://doi.org/10.18203/2320-1770.IJRCOG20184137>
9. Mohib, A., Zafar, A., Najam, A., Tanveer, H., & Rehman, R. (2018). Premenstrual syndrome: Existence, knowledge, and attitude among female university students in Karachi. *Cureus*, 10(3), e2290. <https://doi.org/10.7759/cureus.2290>
10. Hennegan, J., & Montgomery, P. (2016). Do menstrual hygiene management interventions improve education and psychosocial outcomes for women and girls in low and middle income countries? A systematic review. *PLoS ONE*, 11(2), e0146985.
11. Sumpter, C., & Torondel, B. (2013). A systematic review of the health and social effects of menstrual hygiene management. *PLoS ONE*, 8(4), e62004.
12. Sommer, M., Hirsch, J. S., Nathanson, C., & Parker, R. G. (2015). Comfortably, safely, and without shame: Defining menstrual hygiene management as a public health issue. *American Journal of Public Health*, 105(7), 1302–1311.
13. Mason, L., Nyothach, E., Alexander, K., Odhiambo, F. O., Eleveld, A., Vulule, J., Rheingans, R., Laserson, K. F., Mohammed, A., & Phillips-Howard, P. A. (2013). "We keep it secret so no one



- should know”—A qualitative study to explore young adolescent girls’ attitudes and experiences of menstruation in rural western Kenya. *PLoS ONE*, 8(11), e79132.
14. House, S., Mahon, T., & Cavill, S. (2012). *Menstrual Hygiene Matters: A Resource for Improving Menstrual Hygiene Around the World*. WaterAid.
 15. Sommer, M. (2010). Where the education system and women’s bodies collide: The social and health impact of girls’ experiences of menstruation and schooling in Tanzania. *Journal of Adolescence*, 33(4), 521–529.
 16. McMahon, S. A., Winch, P. J., Caruso, B. A., Obure, A. F., Ogutu, E. A., Ochari, I. A., & Rheingans, R. D. (2011). “The girl with her period is the one to hang her head”: Reflections on menstrual management among schoolgirls in rural Kenya. *BMC International Health and Human Rights*, 11, 7.
 17. Caruso, B. A., Clasen, T. F., Hadley, C., Yount, K. M., Haardörfer, R., & Rout, M. (2017). Understanding and defining sanitation insecurity: Women’s gendered experiences of sanitation in rural Odisha, India. *Social Science & Medicine*, 179, 80–89.
 18. Sivakami, M., van Eijk, A. M., Thakur, H., Kakade, N., Patil, C., Shinde, S., Surani, N., Bauman, A., Zulaika, G., Kabir, Y., Dobhal, A., Singh, P., Tahiliani, B., Mason, L., Alexander, K. T., Thakkar, M. B., Laserson, K. F., & Phillips-Howard, P. A. (2019). Effect of menstruation on girls and women’s education, work, and health: A systematic review of qualitative and quantitative evidence. *International Journal of Reproductive Medicine*, 2019, 8394541.
 19. Kim, K. M., & Choi, J. S. (2020). Female university students’ menstrual-hygiene management and factors associated with genitourinary-tract infections in Korea. *Women & Health*, 60(5), 559–569. <https://doi.org/10.1080/03630242.2019.1680482>
 20. Hennegan, J., & Quigley, P. (2021). A systematic review of the menstrual experiences of university students and the impacts on their education: A global perspective. *PLOS ONE*, 16(9), e0257333.