



Sustainable Cycles: Reducing the Environmental Impact of Menstrual Products

CLINICAL QUESTION

What is the environmental impact of different menstrual products, and how can healthcare practitioners help patients reduce their ecological footprint?

BOTTOM LINE

Reusable menstrual products have a smaller environmental impact, similar impacts on health, and are more cost-effective for patients long-term compared to traditional single-use menstrual products. Health care practitioners can assist patients trying to navigate menstrual product choices by informing them of differences in environmental impact, cost, use, and cleaning requirements, and possible health impacts, while honoring patients' personal preferences.

EVIDENCE

It is estimated that a person menstruates 456 times throughout their lifetime, using more than 10,000 menstrual products ([The Lancet Regional Health - Americas, 2022](#)). An estimated 49 billion disposable menstrual products are used per year in the European Union alone, and the plastic in these products is expected to take 500-800 years to decompose ([Aujla, 2024](#)). The United Nations Environment Programme (UNEP) Life Cycle Initiative produced a document outlining the environmental impact of various menstrual products across their lifetime ([UNEP, 2021](#)).

Environmental Impact

- Fossil fuel consumption and greenhouse gas production are highest for single use pads and tampons, particularly those made from plastic and bleached wood pulp ([Fourcassier, 2022](#); [Hait & Powers, 2019](#)). Disposable pads and tampons require the most water consumption for manufacturing compared to other menstrual products ([Fourcassier, 2022](#)).
- Disposable products also produce the most plastic waste, as menstrual pads have a plastic lining, most tampons have plastic applicators, and both use plastic packaging ([Fourcassier, 2022](#)). Disposable options that produce less plastic waste include pads made from plant-based fibers (such as bamboo or organic cotton), tampons with cardboard applicators or no applicators, and products with compostable packaging ([Sadaf, 2025](#); [Hait & Powers, 2019](#)). However, organic cotton tampons and pads require more water and land usage compared to non-organic cotton ([Fourcassier, 2022](#)).
- The UNEP meta-analysis found that across their 10-year lifespan, menstrual cups had less than 1.5% of the environmental impact of disposable tampons or pads. Even for a single menstrual cycle, menstrual cups have a lower environmental impact than tampons or pads ([UNEP, 2021](#)).
- Menstrual cups have the lowest water usage throughout their entire lifecycle, with only a small amount required for cleaning and sterilization. Other reusable products, such as reusable pads and underwear, require more water for washing between uses ([Fourcassier, 2022](#)).

- Systematic reviews and life cycle assessments show that menstrual cups and reusable pads or underwear (when made with locally sourced and sustainable materials) outperform disposable options regarding plastic production. Menstrual cups and discs are made from medical-grade silicone, have a lifespan of up to 10 years, and are ultimately disposed of as a small, single item ([UNEP, 2021](#)).

Ease of use

- A systematic review and meta-analysis on the use, safety, leakage, and acceptability of menstrual cups showed that in high-income countries, only 11-33% of participants were aware of menstrual cups ([van Eijk, 2019](#)). After a few cycles of menstrual cup use, 70% of participants wished to continue using them. Education and support helps patients overcome the learning curve of menstrual cup use and represents a potential role for healthcare professionals.
- Applicator-less, 100% cotton tampons are more easily disposed of when patients do not have access to water or facilities for cleaning reusable options (e.g. in remote settings or when camping) ([UNEP, 2021](#)).
- A study of red blood cell capacity of menstrual products showed that menstrual discs had the largest volume capacity at 61 ml. Menstrual cups, and disposable tampons or pads (heavy or super) held similar volumes (20-50 ml), while period underwear held the smallest volume (3 ml) ([DeLoughery, 2023](#)). Studies found either no difference or a slight decrease in leakage when using menstrual cups compared to disposable pads or tampons ([van Eijk, 2019](#)).
- Many people combine internal and external menstrual products as a way to limit leakage. A life cycle assessment found that combining menstrual cups with reusable pads or period underwear had a lower environmental impact than combining disposable tampons and pads ([Fourcassier, 2022](#)).
- In a study introducing reusable pads and menstrual cups to Ugandan women and girls, 77% of reusable pad users and 88% of menstrual cup users were satisfied by the absence of smell ([van Eijk, 2021](#)). Similarly, absence of odour was reported as an advantage of menstrual cups over pads in a study of women and girls in Zambia ([Gondwe, 2025](#)).

Health impacts

- Infection risk (with bacterial vaginosis, candidiasis, E. coli, and S. aureus) was similar or reduced in menstrual cups compared to disposable pads or tampons. Very few cases of toxic shock syndrome (TSS) were found to be associated with menstrual cup use ([van Eijk, 2019](#)).
- Decreased rates of skin irritation were reported with reusable pads compared to their disposable counterparts ([van Eijk, 2021](#)).
- For patients with intrauterine devices (IUDs) who still require menstrual products, further research is needed to establish to what extent menstrual cup use impacts IUD dislodgement ([Bowman, 2023](#)).
- Although there are several studies investigating the presence of harmful chemicals in menstrual products, there remains little data on the absorption of environmental toxins (e.g. phthalates, metals, dioxins) through the vaginal mucosa and the resulting health effects ([Upson, 2022](#)).

CONTEXT

- In Canada, 21% of individuals have experienced period poverty, meaning that they are unable to afford or access menstrual products ([Plan International Canada, 2022](#)). People who menstruate spend an average of \$6000 across their lifetime on period products. ([Craggs, 2018](#)). Although menstrual cups have a higher up-front cost, this comprises only 5% of the cost of disposable pads and 7% of the cost of tampons over a cup's 10-year lifespan ([van Eijk, 2019](#)).
 - There is currently a lack of North American/European research comparing reusable pads/underwear to their disposable counterparts with regards to fossil fuel consumption, land use, and CO2 consumption.
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REFERENCES

- Aujla M, Logie CH, Hardon A, Narasimhan M. Environmental impact of menstrual hygiene products. (2025). *Bull World Health Organ*;103(3):223-225. doi: 10.2471/BLT.24.291421
- Bowman N, Thwaites A. Menstrual cup and risk of IUD expulsion - a systematic review. *Contracept Reprod Med*. 2023 Jan 21;8(1):15. doi: 10.1186/s40834-022-00203-x. Erratum in: *Contracept Reprod Med*. 2023 Feb 27;8(1):23. doi: 10.1186/s40834-023-00219-x
- Craggs, S. (2018, December 10). *Hamilton looks at buying menstrual products for low-income women and girls* | *CBC news*. CBCnews. <https://www.cbc.ca/news/canada/hamilton/femcare-hamilton-1.4939718>
- DeLoughery E, Colwill AC, Edelman A, Samuelson Bannow B. Red blood cell capacity of modern menstrual products: considerations for assessing heavy menstrual bleeding. (2024). *BMJ Sex Reprod Health*;50(1):21-26. doi: 10.1136/bmjsex-2023-201895
- Fourcassier, S., Douziech, M., Pérez-López, P., Schiebinger, L. Menstrual products: a comparable life cycle assessment. (2022). *Cleaner Environmental Systems*.7:1–8. <https://doi.org/10.1016/j.cesys.2022.100096>.
- Gondwe M, Simuyaba M, Phiri M, Mwansa C, Schaap A, Sigande L, Shanaube K, Floyd S, Fidler S, Ayles H, Simwanga M, Hensen B. Acceptability of and experiences with menstrual hygiene cups among adolescent girls and young women aged 15-24 in two communities in Lusaka, Zambia: an exploratory study nested in the Yathu Yathu trial. (2025). *Reprod Health*;22(1):20. doi: 10.1186/s12978-024-01901-2
- Hait, A., & Powers, S. E. (2019). The value of reusable feminine hygiene products evaluated by Comparative Environmental Life Cycle Assessment. *Resources, Conservation and Recycling*, 150, 104422. <https://doi.org/10.1016/j.resconrec.2019.104422>
- Mirzaie, A., Brandão, M., & Zarrabi, H. (2025). Toward eco-friendly menstrual products: a comparative life cycle assessment of sanitary pads made from bamboo pulp vs. a conventional one. *Environmental science and pollution research international*; 32(14), 9050–9067. <https://doi.org/10.1007/s11356-025-36269-8>
- Plan International Canada. Menstruation in Canada - Views and Realities, May 2022. https://www.multivu.com/players/English/9052951-menstrual-health-day-2022/docs/ViewsandRealities_1653434611799-556425632.pdf
- Regional Health-Americas TL. Menstrual health: a neglected public health problem. (2022) *Lancet Reg Health Am*;15:100399. doi: 10.1016/j.lana.2022.100399.
- Sadaf, S., Ahmad, F., Rasheed, A., Nawab, Y., Ahmad, S., Azam, F., & Mushtaq, B. (2025). Sustainable sanitary pads: A comprehensive review of natural fibers and bio-based superabsorbent polymers for eco-friendly menstrual hygiene. *International Journal of Biological Macromolecules*, 327, 147524. <https://doi.org/10.1016/j.ijbiomac.2025.147524>
- United Nations Environment Programme (2021). Single- use menstrual products and their alternatives: Recommendation from the Life Cycle Assessment
- Upson K, Shearston JA, Kioumourtzoglou MA. Menstrual Products as a Source of Environmental Chemical Exposure: A Review from the Epidemiologic Perspective. (2022). *Curr Environ Health Rep*; 9(1):38-52. doi: 10.1007/s40572-022-00331-1
- van Eijk AM, Zulaika G, Lenchner M, Mason L, Sivakami M, Nyothach E, Unger H, Laserson K, Phillips-Howard PA. Menstrual cup use, leakage, acceptability, safety, and availability: a systematic review and meta-analysis. (2019). *Lancet Public Health*;4(8):e376-e393. doi: 10.1016/S2468-2667(19)30111-2
- van Eijk, A. M., Jayasinghe, N., Zulaika, G., Mason, L., Sivakami, M., Unger, H. W., & Phillips-Howard, P. A. Exploring menstrual products: A systematic review and meta-analysis of reusable menstrual pads for public health internationally. (2021). *PLOS ONE*; 16(9). <https://doi.org/10.1371/journal.pone.0257610>

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