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Original Research Article

Menstrual product choice and the extent of period poverty among young adult females: findings from a cross-sectional study in Kerala, India

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ABSTRACT

Background: In Kerala state, India, while there is higher coverage of hygienic methods for menstrual protection among young women, empirical evidence on menstrual hygiene management is limited. This study aims to present menstrual hygiene product choices and the extent of period poverty among young adult females in Kerala.

Methods: A cross-sectional study was conducted in Kerala using a web-based Google form. Data were collected on menstrual product usage, perceptions and attitudes towards menstruation, awareness and use of government initiatives for menstrual hygiene management, perspectives on better management, period poverty, and associated factors.

Results: The mean age of respondents was 21.7 years (SD±2.0). Cultural beliefs hindered the choice of menstrual products. Period poverty was reported by 25.5% of respondents, with higher rates among younger, lower social category, and unemployed individuals. Lower income and negative attitudes towards menstruation were significantly associated with higher period poverty.

Conclusions: There is a need for free menstrual products for the financially disadvantaged. Further research is necessary to gain a comprehensive understanding of period poverty in this community.

Keywords: India, Kerala, Menstrual product choice, Period poverty, Young adult females

INTRODUCTION

Adequate menstrual health is considered a basic human right, however, millions of menstruators all around the world fail to manage their periods in a dignified manner.¹ Globally, nearly 500 million women lack proper access to menstrual hygiene management.² In low and middle-income countries, the extent of poverty forces them to rely upon unhygienic menstrual products like old clothes, rags, straw, etc.³ Moreover, the prevailing secrecy and lack of public discussion about menstruation adversely affect the life of menstruators.⁴

The accessibility of menstrual products like pads is very low to a large proportion of the population in India.⁵⁻⁷ The practice of reusable menstrual products is limited to pro-environmental, well-educated urban women in higher socioeconomic classes with comparatively low awareness about these products among rural women.⁸ There is also a general hesitance in society to use reusable menstrual products.⁹⁻¹² Concomitantly, there are limited public efforts towards informing women about sustainable alternatives in menstruation management. This coupled with widely prevalent patriarchal and traditional taboos in India adversely affects menstrual hygiene management practices.¹³

As it is widely known, the market for period products is substantial and complex owing to over two billion people in the reproductive age groups worldwide and over 85% of them living in the LMICs.¹⁴ Durable re-usable products are not widely promoted probably due to multiple reasons: low education, conservative Indian market where taboos galore as many believe that insertions can cause damage to hymen; low margins for firms in durables as repeat purchasers are less while the market for disposables is lucrative.¹⁵⁻¹⁹

‘Period poverty’ has been defined as inadequate access to menstrual hygiene tools and education, including but not limited to sanitary products, washing facilities, and waste management.²⁰ Hardware period poverty, also known as material deprivation, consists of the lack of access to affordable sanitary absorbents and adequate water, sanitation, and hygiene (WASH) facilities.^{21,22} On the other hand, software period poverty attributed to psychosocial/knowledge deprivation, is described as the lack of adequate education and basic knowledge on menstruation.²¹⁻²⁴

There is inadequate information on period poverty in general and the existing evidence is mainly from qualitative, participatory, and descriptive methods. As is well established, quantitative studies are needed to measure the magnitude of the issue and understand its linkage with other quantifiable determinants of menstrual management.²⁵ Kerala is one of the states in India with the highest coverage of a hygienic method of menstrual protection which stands at 93% among young women aged 15-24 years with a rural-urban gap of only three percent.²⁶ The state is non-metropolitan, where the rural-urban distribution of population, health care facilities and education infrastructure is least skewed. However, despite this success, there is limited empirical evidence on menstrual hygiene practices and period poverty in the state. In this study, we aimed to present choices in menstrual hygiene products and the extent of period poverty among young adult females in the Kerala state of India.

METHODS

This cross-sectional quantitative study primarily looked at the general usage of menstrual products; exploring their choice and use and hindrances in adopting preferred choices for menstrual products. Awareness and usage of Government initiatives particularly ‘*Janaushadhi Suvidha Sanitary Napkins Scheme*’ (A Government of India initiative in which sanitary pads are available at subsidized rates at designated stores (‘*Janaushadhi*’ stores) were also examined.

We conducted the study among young menstruators in Kerala state of India. A bilingual [English-*Malayalam* (local language)] semi-structured questionnaire was prepared to be filled in Google forms. The study tool was piloted among twenty young adults and relevant feedback

was incorporated before the main survey. The survey link was sent online through email and WhatsApp to young female adults, including students, and working and non-working people all over the state, with a request to share information. A brief description of the survey was provided to inform the aim of the study. The survey was open from April to May 2022. The inclusion criteria were: young adult females in the reproductive age group of 18-30 years, who could read and understand English or *Malayalam* and who were residing in Kerala state for the last one year. The exclusion criteria were: women who achieved menopause and pregnant women. There was no pre-determined sample size. A total of 501 people responded to the survey during the survey period and all that data were included for analysis in the present study. Since Kerala has one of the highest rural tele-densities and smartphone densities in the country, the negative impact of the digital divide might have been minimized in the sample frame. Since the majority of our respondents were either students (57%) or unemployed (31%) young adult females, we cannot rely solely on income-based estimates for defining period poverty. However, period poverty was explored along with reflections on its hardware and software facets. Ethical clearance of the study was obtained from the Institutional Ethics Committee. Online consent was obtained from all participants at the beginning of the survey.

Statistical analysis

The analysis was performed using SPSS (SPSS Inc., Chicago, IL, USA, version 23.0 for Windows). Both univariate and bivariate analysis were done. The Chi-square test was used to compare the categorical variables. The statistical significance was fixed as <0.05. Additionally, responses to open-ended questions were categorized into groups based on themes.

RESULTS

We analysed a total of 501 young adult females in the age group of 18-26 years. The mean age of the sample was 21.7 (SD±2.0) years. More than half of the respondents were students, 31% were unemployed and the remaining 12% were employed. The majority of the respondents were unmarried (85.4%) and belonged to nuclear families (88.2%). The respondents belonged to different social classes. About 46% belonged to forward category while 47% were from other backward communities (OBC) and 6% belonged to scheduled categories (consisting of tribal groups and economically and socially very poor). Details of sociodemographic characteristics are presented in Table 1.

General usage of menstrual products in menstrual hygiene management

General awareness regarding menstrual products like cloth, cloth pads, disposable pads, menstrual cups, panty liners, tampons, fibre pads, and period panties was

reported by the respondents. However, the majority of the respondents used disposable menstrual products (90.0%). About 6.4% used reusable products while 3.6% used a combination of both. Disposable sanitary pads were used by the majority (96.6%). Very few proportions of the respondents used menstrual cup, period panty and tampons (0.2%, 1.4% & 3.4%). These products were reported to be purchased from general and medical stores. About half of the respondents got awareness about the products from their family members; while the other half received it through social media and peer groups. Nearly, one-fourth of the respondents switched to a different product from their usual product. The pointed-out intentions for the substitutions were better hygiene, health concerns, convenience, availability, reusability, ease of disposal, eco-friendliness and cost-effectiveness.

Table 1: Background characteristics of the study participants.

Characteristics	N (%)
Age	
18-20	155 (30.9)
21-23	257 (51.3)
24-26	89 (17.8)
Marital status	
Unmarried	428 (85.4)
Married	73 (14.6)
Social group	
Forward caste	236 (47.1)
OBC	235 (46.9)
SC/ST	30 (6.0)
Education	
Under graduate	243 (48.5)
Professional education	176 (35.1)
Post-graduate	18 (3.6)
Others	64 (12.8)
Occupation	
Student	283 (56.5)
Unemployed	157 (31.3)
Employed	61 (12.2)
Age at menarche (in years)	
<11	62 (12.4)
12-13	317 (63.2)
≥14	122 (24.4)
Educational qualification of mother	
Illiterates	117 (23.4)
School education	39 (7.8)
College education	345 (68.9)
Type of family	
Nuclear family	442 (88.2)
Joint family	59 (11.8)

OBC-other backward classes; SC/ST-Scheduled castes/scheduled tribes based on the Government of India category

A general preference towards disposable menstrual products was noted among the study participants. However, when the respondents were enquired about the

hindrances to using reusable menstrual products, most of them opined that lack of information and limited availability kept them back. However, some of them felt restrictions from their mothers in choosing reusable products primarily over concerns about reproductive health. Along with the fear of usage, pain, and stigma many of them were reluctant to try a change; as a participant remarked;

“I would like to use other products like menstrual cups and tampons, but fear of pain is something that holds me back from using it”.

When explored about a situation where reusable menstrual products were easily available as disposable menstrual products, only 19.2% responded they would be more inclined to buy reusable products rather than disposable ones. As the majority of the respondents were using disposable menstrual products, burning, burial, flushing, and dumping in waste bins were reported as the main methods of menstrual waste disposal. However, very few of them reported having sound incinerators in their institutions as remarked by a respondent;

“Even though incinerators are there, they will not be working most of the time. I take it to home.”

Perceptions and attitudes towards menstruation

The majority of the respondents discussed menstrual issues at home. Stigma and lack of knowledge were reported as reasons for the lack of discussion within the family. Although only one-fourth of the respondents themselves felt a negative attitude toward menstruation majority of them perceived the attitude of society to be negative. However, more than half of the study participants reported that cultural beliefs act as a hindrance in choosing sustainable menstrual products. About one-fourth opined that concerns about reproductive health and fertility adversely affect the use and choice of particular menstrual products. Yet, the majority of respondents believed that social media changed their attitude toward menstruation (Table 2).

Awareness and Usage of Government initiatives for menstrual hygiene management

Nearly three fourth of the respondents were not aware of the term ‘period poverty’. Only one-third were aware of any government initiatives to promote the use of menstrual products. The majority of the respondents (82.4%) were not aware of Government sponsored ‘Janaushadhi Suvidha Sanitary Napkins Scheme’. Out of 88 respondents who were aware of the scheme, only 19 of them purchased pads from these centers. These pads supplied by the government being biodegradable and affordable motivated the few users to continue utilizing this service. Nevertheless, distance to the nearest *Janaushadhi Center* and lack of stock were reported to be the main difficulties faced while purchasing the pads.

Table 2: Perceptions and attitude towards menstruation.

Attitude towards menstruation	N (%)
Discuss menstrual issues at home	474 (94.6)
Negative feeling about menstruation	121 (24)
Negative societal attitude towards menstruation	415 (83)
Cultural beliefs impede acceptance of sustainable menstrual products	317 (63.2)
Concerns about reproductive health and fertility adversely affect the use of particular menstrual products	136 (27)
Social media changed attitude towards menstruation	431 (86)

Perspectives for better menstrual hygiene management

The majority of the respondents opined that better knowledge about the choice of menstrual products improves menstrual hygiene practices. Furthermore, greater availability of menstrual products was reported to improve the menstrual health of young girls. Public discussions and campaigns about menstruation and

products were found to enhance the choice of menstrual products. The majority were of the opinion that there should be a wider and more accessible sustainable option for period products. Free or subsidized distribution of menstrual products, increasing availability, price reduction, and generating awareness about alternative products were suggested by the respondents as initiatives to be taken from the government side (Table 3).

Table 3: Respondents’ perspectives for better menstrual hygiene management.

Perspectives for better menstrual hygiene management	N (%)
Free or subsidized distribution of sanitary pads encourage better menstrual hygiene practice	445 (88.8)
Better knowledge about menstruation increases the choice of menstrual products.	483 (96.4)
Better availability of menstrual products improves the menstrual health of young girls.	474 (94.6)
Public discussions about menstruation and products enhance the choice of menstrual products available to menstruators.	467 (93.2)
Different campaigns for use of menstrual products increase choice on them.	422 (84.2)
There should be a wider and more accessible sustainable option for period products	462 (92.2)

Table 4: Period poverty and associated factors.

Characteristics	Period poverty		Total	P value
	No, N (%)	Yes, N (%)		
Age group				
<=21	165 (72.1)	64 (27.9)	229 (100.0)	0.260
>21	208 (76.5)	64 (23.5)	272 (100.0)	
Social group				
Forward caste	183 (77.5)	53 (22.5)	236 (100.0)	0.260
OBC	170 (72.3)	65 (27.7)	235 (100.0)	
SC/ST	20 (66.7)	10 (33.3)	30 (100.0)	
Education				
Graduate and above	199 (76.2)	62 (23.8)	261 (100.0)	0.546
Professional qualification	126 (71.6)	50 (28.4)	176 (100.0)	
Others	48 (75.0)	16 (25.0)	64 (100.0)	
Occupation				
Student	218 (77.0)	65 (23.0)	283 (100.0)	0.318
Unemployed	112 (71.3)	45 (28.7)	157 (100.0)	
Employed	43 (70.5)	18 (29.5)	61 (100.0)	
Monthly income (INR)				
<10000	143 (68.8)	65 (31.2)	208 (100.0)	0.017
≥10000	230 (78.5)	63 (21.5)	293 (100.0)	
Negative attitude towards menstruation*				
No	254 (79.4)	66 (20.6)	320 (100.0)	0.001
Yes	119 (65.7)	62 (34.3)	181 (100.0)	

*vice versa, OBC: Other backward community, SC: Scheduled Caste, ST: Scheduled Tribes

Period poverty and associated factors

The reported barriers to buying preferred menstrual products were price, cultural barriers, stigma, lack of availability and awareness, ignorance about alternative products, and lack of family and peer support. About 68% of the respondents opined that menstrual products were overpriced. Around 17% of respondents faced financial difficulties while purchasing menstrual products. The majority of the respondents (96%) also reported a lack of adequate information and awareness for choosing menstrual products.

The extent of period poverty (inadequate access to menstrual products including financial affordability or other constraints to accessing the menstrual products) was reported by 25.5% of the respondents. Variables like age, education, occupation, income and social groups were analysed for their association with period poverty. Yet, there is no statistically significant difference in period poverty with variables like age, education, occupation, income and social group. However, younger aged respondents reported higher extend of period poverty compared to older age groups. Those who were in lower social category experienced period poverty to a greater level compared to forward casts. Unemployed respondents and those with lower incomes also reported a higher proportion of period poverty compared to their counterparts. Moreover, females who reported negative attitudes towards menstruation experienced a significantly higher proportion of period poverty (Table 4).

DISCUSSION

In our study we focused on menstrual hygiene product choices of young adult females and the extent of period poverty experienced by them. The study was primarily done with an intend to understand how young adult females of 'new generation' choose their menstrual products, their perspectives for better menstrual hygiene management and whether they experienced 'period poverty'. Moreover, we intended to have a general understanding of utility of government schemes for menstrual hygiene management and whether young people make use of such schemes. We have found that about one fourth of the respondents in our study experienced period poverty, preferred disposable menstrual products and perceived that attitude of society towards menstruation was still negative. The awareness and usage of government schemes was also found to be poor. Our study thus points out that efforts in this direction need to be refocused by understanding existing preferences and perspectives of these young adults.

Addressing menstrual health is an important social responsibility mainly because the physiological process of menstruation has metamorphosed into a physical, psychological, and financial impediment in the lives of women.²⁷⁻³⁰ Menstrual matters still remain a taboo in our study setting as elsewhere and more people talking about

it in public spaces is expected to bring changes in the societal attitude towards menstruation.³¹ However, stigma act as a major constraint for discussing menstrual issues at home as reported in our study. This can be viewed as a matter of concern as even in young educated females' constraints related to menstruation are still hanging on to age old stigma and cultural taboos. Henceforth, provision and free availability of menstrual products may not at times prove beneficial in menstrual hygiene management. Stigmatization restricts open discussion of problems related to experiences of menstrual hygiene management without which solutions cannot be identified as described in a study conducted in LMIC countries.³² However, in our study a notable finding was that majority of participants perceived the attitude of society towards menstruation to be negative. This is consistent with literature as a study by Elhage et al. pointed out that the seed of all hindrances stems from societal values and stigma demanding a powerful change in societal discourse and behaviour.³³ This coupled with concerns about reproductive health and fertility adversely affect the use of particular menstrual products among women as seen from our study.

Rooted beliefs and taboos can be changed only by revolutionized approaches. As education becomes a social determinant of health, appropriate guidance and trainings on menstruation related matters right from school days at a young age, given in a gender sensitive manner can bring about moral changes in new generation. When focusing on education, if it is made gender neutral incorporating adolescent boys, it may in future help in rebuilding taboo free families and society.

One-time-use products are a serious challenge in addressing menstrual equity as it needs enormous resources, recycling, and management which is very demanding.³⁴ Informal feedback received from school and college students indicate that a large number of them lack an understanding of the operation of incinerator thereby dumping the used menstrual pads in the toilets and blocking the drainage system. However, our respondents have also reported concerns over nonworking incinerators and some of them even take used products back home for disposal. Nevertheless, there are some examples of local governments successfully trying to implement sustainable menstruation. For example, in Kerala state, the government initiated a scheme named "*She Pad*", in 2017 to assess as well as ensure environment friendly disposal of menstrual products.^{8,35} Also, the project *Thinkal* (distribution of free menstrual cups) and '*Cup of life*' in Kochi, Kerala tried to make impacts in menstrual hygiene management.^{36,37} However, when explored about a situation when reusable menstrual products were easily available, only less than one-fourth of the respondents were willing to try reusable products rather than disposable ones. This points to the fact that not only the availability of products but also associated factors of lack of knowledge, stigma, cultural hindrances, and family pressures may obstruct women from exercising at-will choices for their menstrual needs. These findings simulate

the study done in northwest England by Boyers et al, where participants were resistant to the idea of reusable products due to a lack of information and knowledge which was analysed as an initial barrier to acceptance.²⁷ In this context Mahajan et al., pointed out the relevance of 'informed choice' as the ability to 'choose' a menstrual hygiene product without bias through comprehensive information on all types of menstrual hygiene products to satisfy personal, reproductive, and socio-economic needs.³⁸

We have also explored government initiatives in India like 'Janaushadhi Suvidha Sanitary Napkins Scheme', by which biodegradable and affordable sanitary pads were made available in designated centers. However, awareness about the scheme was very limited and utilization of the service was also narrow due to accessibility and availability issues related to such centers. These reports reinforce the understanding that programs when implemented may primarily take into consideration the feasibility and extent of usage as expected from the targeted population. In addition to this, the government need to take necessary steps to reduce the price of menstrual products to address period poverty, which will in turn enhance the choice of menstrual products. Since the country is very diverse in terms of culture, demography, economy, geography, language, and polity, one country one scheme might not work, rather a collective approach with local self-governments at the core has huge potential to transform the menstrual hygiene management system from a disposal oriented to a circular one. Globally, high-income countries have started free distribution and waiver of taxes on menstrual products.³⁹⁻⁴¹

Given that Kerala is the region with the highest education attainments in the country and social indicators, associated qualitative improvements have been expected. Though unhygienic methods are almost non-existent, the use of durable products even among higher-income groups is less anticipated. As expected, education seems to play a strong influence on the use of durable products like menstrual cups partly due to peer group effects. The use of durables is less among the underprivileged group because buying such products requires a comparatively higher amount at the initial period. Studies in other countries also conclude that the financial burden posed by menstrual products is of serious concern.^{42,43} Disposable products continue to be the most popular method elsewhere. The majority of participants in our study also preferred disposable sanitary pads. In our study, price act as the major barrier for students and unemployed respondents. In face of high prices, adaptive strategies like resorting to cheaper and unhealthy substitutes, delaying the change of pads, etc. will in turn accentuate stress and shame in menstruators.^{29,44}

As is recognized, period poverty in our study reflects along dimensions including the absence of adequate resources to manage periods, menstrual education and awareness and access to menstrual products. As mentioned elsewhere period poverty is treated as transient poverty, due to its

acute nature. As per the estimates of the study, about one-fourth of the study respondents suffered from period poverty. Paradoxically, in a state like Kerala, the majority reported a lack of adequate information for choosing menstrual products. Public health education on the topic of menstruation is lacking even in clinical and public health academia.⁴⁵ This signalizes the fact that targeted education and awareness on menstrual management is highly important in women of reproductive age irrespective of their educational status. The reported barriers to buying preferred menstrual products were price, cultural barriers, stigma, lack of availability, ignorance about alternative products, and lack of family and peer support. Therefore, the burden of stigma, cultural barriers, and lack of family support on menstruators cannot be kept apart when discussing preferred choices for menstrual products even in women who seem to be more educationally advanced. However, the perspectives of respondents clearly lighten up the significance of better knowledge, public discussions, and campaigns about menstruation in enhancing the choice of menstrual products. Moreover, better availability, accessibility, and affordability through subsidized distribution of menstrual products in workplaces and educational institutions along with awareness generation can definitely intensify efforts toward menstrual hygiene management. Thus, there exists huge potential for innovations in the market and with increasing competition, more information might flow into the population.

Since this was an online survey, the limited control of the researchers on the nature and route of circulation of the questionnaire might have reflected the representation of the data collected. Hence, the result is solely representative and not an exact sociological paradigm of the perspectives and experiences of young adult females in Kerala. The result of the study does not conclude the extent of period poverty in a community setting. Also, we cannot derive proper inference on the associated factors of period poverty. The availability of WASH and toilet facilities has not been mapped in this study. Valid scientific conclusions based on the statistical test are not evidenced in this study. However, the present study results give information on menstrual hygiene practices and the extent of period poverty in terms of inadequate access to preferred menstrual products. Future studies should include detailed measurements of different components of period poverty, especially among marginalized groups.

CONCLUSION

Period poverty is a neglected public health problem that is largely associated with stigma. The choice of unhygienic alternatives put menstruators with negative physical and mental health outcomes. Menstrual inequities need to be eliminated for ensuring better menstrual hygiene practices. The right to access menstrual products and the achievement of menstrual equity can be achieved by ensuring safe, accessible, and destigmatized period products.

Recommendations

Kerala is a state with active local self-government and has a higher literacy rate among women. Taking the discussion on period poverty could go a long way in addressing it through the provision of resources for menstrual hygiene management in this state. If campuses could install condom vending machines with a public health implication, it is more important that they ought to instate machines dispensing menstrual products at near zero or zero prices. Efforts to make free menstrual products for at least the financially backward group are warranted in the community. A comprehensive understanding of period poverty is limited, which calls for the need for further research using mixed-methods approaches to assess the complexity of period poverty and for a better understanding of the extent of the problem in this area.

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REFERENCES

- UNICEF. Guidance on menstrual health and hygiene. 2019. Available at: <https://www.unicef.org/media/91341/file/UNICEF-Guidance-menstrual-health-hygiene-2019.pdf>. Accessed on 2 October 2022.
- The World Bank. Menstrual health and hygiene. 2022. Available at: <https://www.worldbank.org/en/topic/water/brief/menstrual-health-and-hygiene>. Accessed on 2 October 2022.
- Millington KA, Bolton L. Improving access to menstrual hygiene products. GSDRC Help Res Rep 1280 GSDRC Birmingham, UK. 2015. 65-6. Available at: <https://gsdrc.org/publications/improving-access-to-menstrual-hygiene-products/>. Accessed on 2 October 2022.
- Carneiro MM. Menstrual poverty: enough is enough. *Women Health*. 2021;61(8):721-2.
- UNICEF. Menstrual Hygiene Management Program, 2022. Available at: <https://help.unicef.org/in/WASH/menstrualhygiene>. Accessed on 3 October 2022.
- Chakravarthy V, Rajagopal S, Joshi B. Does menstrual hygiene management in urban slums need a different lens? challenges faced by women and girls in Jaipur and Delhi. *Indian J Gend Stud*. 2019;26(1-2):138-59.
- Garikipati S. Asymmetric Information in Menstrual Health and Implications for Sustainability: Insights from India. In: Ranjula Bali Swain, Susanne Sweet, editor. Springer Books, Sustainable Consumption and Production; 2021:391-412.
- Meenakshi N. Taboo in consumption: Social structure, gender and sustainable menstrual products. *Int J Consum Stud*. 2020;44:243-57.
- Bhattacharyya M, Sen P, Hazra S, Sinha RN, Sahoo S. A study of menstrual hygiene among adolescent school girls in a slum area of Kolkata. *Ntl J of Community Med*. 2015;6(03):345-8.
- Jitpure, S. Assessment of menstrual hygiene, menstrual practices and menstrual problems among adolescent girls living in urban slums of Bilaspur (Chhattisgarh). *IOSR J Dent Med Sci*. 2016;15(10):16-20.
- Sharma S, Mehra D, Kohli C, Singh MM. Menstrual hygiene practices among adolescent girls in a resettlement colony of Delhi: A cross sectional study. *Int J Reprod Contraception Obstet Gynecol*. 2017;6(5):1945-51.
- Lamont MJ, Wagner MK, Incorvati GC. The relationship of self-objectification and body shame to attitudes toward and willingness to use reusable menstrual products. *Women's Reprod Heal*. 2019;6(1):1-16.
- Kaur R, Kaur K, Kaur R. Menstrual hygiene, management, and waste disposal: practices and challenges faced by girls/women of developing countries. *J Environ Publ Heal*. 2018;2018:1730964.
- UN-Family planning and the 2030 agenda for sustainable development, 2019. Available at: https://www.un.org/en/development/desa/population/publications/pdf/family/familyPlanning_DataBooklet_2019.pdf. Accessed on 5 October 2022.
- Lakshmi U, Godwin SK. Period poverty : A rapid analysis of Suvidha Scheme in two districts in Kerala, India. *IOSR J Econ Financ*. 2021;12(4):34-6.
- Hait A, Powers SE. The value of reusable feminine hygiene products evaluated by comparative environmental life cycle assessment. *J Resour Conserv Recycl*. 2019;150:104422.
- Van Eijk AM, Zulaika G, Lenchner M, Mason L, Sivakami M, Nyothach E, et al. Menstrual cup use, leakage, acceptability, safety, and availability: A systematic review and meta-analysis. *Lancet Public Heal*. 2019;4(8):e376-93.
- Garikipati S, Docherty JR, Phillips-Howard PA. What's the bleeding problem? Policy and attitudes towards sustainable menstrual hygiene materials in India, Working paper in Economics. University of Liverpool, Liverpool School of Tropical Medicine.2019. Available at: <https://www.liverpool.ac.uk/management/people/economics>. Accessed on 5 October 2022.
- Moffat N. *The Managed Body: Developing Girls and Menstrual Health in the Global South*: by Chris Bobel, Cham, Switzerland, Palgrave Macmillan; 2019:1-351.
- Sommer M, Mason DJ. Period poverty and promoting menstrual equity. *JAMA Heal Forum*. 2021;2(8):e213089.
- Hennegan, J, Montgomery P. 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*. 2016;11(2):e0146985.
- Michel J, Mettler A, Schonenberger S, Gunz D. Period poverty: Why it should be everybody's business. *J Glob Heal Reports*. 2022;6:e2022009.
- Sacca L, Maroun C, Khoury S, Maroun V, Khoury J, Bouery P. Period poverty in Lebanon: a call for action. *Wom Reproduct Heal*. 2023;10(2):236-51.
- United Nations Population Fund. 2022. Menstruation and human rights-frequently asked questions, 2022. Available at: <https://www.unfpa.org/menstruationfaq>. Accessed on 6 October 2022.

25. Phillips-Howard PA, Nyothach E, Ter Kuile FO, Omoto J, Wang D, Zeh C, et al. Menstrual cups and sanitary pads to reduce school attrition, and sexually transmitted and reproductive tract infections: a cluster randomised controlled feasibility study in rural Western Kenya. *BMJ Open.* 2016;6(11):e013229.
26. National Family Health Survey(NFHS-5). India Report International Institute for Population sciences, Ministry of Health and Family Welfare, Government of India, 2022. Available at: <https://iipsindia.ac.in/content/national-family-health-survey-nfhs-5-india-report>. Accessed on 6 October 2022.
27. Boyers M, Garikipati S, Biggane A, Douglas E, Hawkes N, Kiely C, et al. Period poverty: The perceptions and experiences of impoverished women living in an inner-city area of Northwest England. *PLoS One.* 2022;17(7):e0269341.
28. Cardoso LF, Scolese AM, Hamidaddin A, Gupta J. Period poverty and mental health implications among college-aged women in the United States. *BMC Women's Health.* 2021;21(1):14.
29. Das P, Baker KK, Dutta A, Swain T, Sahoo S, Das BS, et al. Menstrual Hygiene Practices, WASH Access and the Risk of Urogenital Infection in Women from Odisha, India. *PLoS One.* 2015;10(6):e0130777.
30. Hennegan J, Dolan C, Wu M, Scott L, Montgomery P. Measuring the prevalence and impact of poor menstrual hygiene management: A quantitative survey of schoolgirls in rural Uganda. *BMJ Open.* 2016;6(12):e012596.
31. Hennegan J, Shannon AK, Rubli J, Schwab KJ, Melendez-Torres GJ. Women's and girls' experiences of menstruation in low- and middle-income countries: A systematic review and qualitative meta synthesis. *PLoS Med.* 2019;16(5):e1002803.
32. Rossouw L, Ross H. Understanding period poverty: socio-economic inequalities in menstrual hygiene management in eight low- and middle-income countries. *Int J Environ Res Public Health.* 2021;18(5):2571.
33. Elhage Hassan M, Doumat G, Daher D, Al Tannir AH, Hassan B, Chidiac C, et al. Menstrual health and period poverty in Lebanon during economic crisis: A qualitative analysis of the challenges and recommendations. *Front Reprod Health.* 2022;4:920461.
34. Elledge MF, Muralidharan A, Parker A, Ravndal KT, Siddiqui M, Toolaram AP, et al. Menstrual hygiene management and waste disposal in low and middle income countries-a review of the literature. *Int J Environ Res Publ Heal.* 2018;15(11):2562.
35. The Kerala State Women's Development Corporation Ltd. Department of women and child development, Govt of Kerala. Gender awareness programs- Menstrual hygiene management in Kerala. Available at: <https://kswdc.org/about-us/projects/>. Accessed on 7 October 2022.
36. My Nation. Kerala: Project Thinkal to distribute 5,000 menstrual cups for free, 2019. Available at: <https://www.mynation.com/india-news/kerala-project-thinkal-distribute-5-000-menstrual-cups-for-free-ptc4jlhttps://www.mynation.com/india-news/kerala>. Accessed on 7 October 2022.
37. The Indian Express. Cup of life': Kerala MP to distribute one lakh menstrual cups for free, 2022. Available at: <https://indianexpress.com/article/trending/trending-in-india/cup-of-life-kerala-mp-to-distribute-one-lakh-menstrual-cups-for-free-8027478/>. Accessed on 7 October 2022.
38. Mahajan T. Imperfect information in menstrual health and the role of informed choice. *Indian J Gend Stud.* 2019;26(1-2):59-78.
39. Hindustan Times. UK abolishes 'tampon tax' on menstrual products, 2021. Available at: <https://www.hindustantimes.com/world-news/uk-abolishes-tampon-tax-on-menstrual-products/story>. Accessed on 7 October 2022.
40. Diamond C. Period poverty: Scotland first in world to make period products free. *BBC News*, 2020. Available at: <https://www.bbc.com/news/uk-scotland-scotland-politics-51629880>. Accessed on 7 October 2022.
41. Triesman R. New Zealand will offer free sanitary products at schools to fight period poverty. *National Public Radio*, 2021. Available at: <https://www.npr.org/2021/02/18/969129496/new-zealand-will-offer-free-sanitary-products-atschools-to-fight-period-poverty>. Accessed on 7 October 2022.
42. Sebert Kuhlmann A, Peters Bergquist E, Danjoint D, Wall LL. Unmet menstrual hygiene needs among low-income women. *Obstet Gynecol.* 2019;133(2):238-44.
43. Vora S. The Realities of Period Poverty: How Homelessness Shapes Women's Lived Experiences of Menstruation. In: Bobel C, Winkler IT, Fahs B, Hasson KA, Kissling EA, Roberts TA. (eds) *The Palgrave Handbook of Critical Menstruation Studies*. Palgrave Macmillan, Singapore; 2020.
44. Mahon T, Fernandes M. Menstrual hygiene in South Asia: A neglected issue for WASH (Water, Sanitation and Hygiene) programmes. *Gend Dev.* 2010;18(1):99-113.
45. Sommer M, Lee C, Liu D, Gruer C. The extent to which menstruation-related issues are included in graduate-level public health curricula. *Front Public Health.* 2020;8:442.

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