Menstrual hygiene practices and their determinants among pre-menopausal married women in rural Puducherry

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ABSTRACT

Background: Menstrual hygiene practices are somewhat poor among pre-menstrual aged rural women, and thereby, they are likely to be affected by menstrual and gynaecological morbidities. Hence, an attempt is made to comprehend the magnitude of menstrual hygiene practices through an index among rural women and identify its principal determinants. Methods: Adopting a community-based cross-sectional study design, the required data was collected (through a semi-structured interview schedule) from 780 married pre-menopausal women (aged 35–49 years) from 30 villages of the Puducherry district during January–April 2021. Descriptive and inferential statistics and multiple linear regression techniques were employed. Results: 56% of the present study respondents have exhibited good menstrual hygienic practices (pooled scores 9–15; Median score = 9). Findings from the multiple linear regression model revealed that women’s education (β = 0.235; P < 0.001), occupational hierarchy (β = 0.110; P < 0.001) and mass media exposure (β = 0.095; P < 0.01) as the critical predictors of menstrual hygiene practices. Such positive net effects were also exhibited by the family monthly income (β = 0.84; P < 0.05) and women’s access to economic resources (β = 0.071; P < 0.05), whereas family size demonstrated a significant adverse effect (β = −0.080; P < 0.05). Conclusions: Overall, menstrual hygiene practices among women are moderately high among better socio-economic status. Efforts may be taken to improve the socio-economic conditions and propagate the correct menstrual hygienic practices among rural women, which may enhance hygiene practices during menstruation.

Keywords: Determinants, menstrual hygiene practices, multiple linear regression, pre-menopausal women, Puducherry

Introduction

Menstruation is a biological and physiological phenomenon in girls’ or women’s lives. It is part of the reproductive cycle of women, which takes place for the first time (known as puberty or menarche), mostly at the age of 12–13 years, and ceases around the age of 45–49 years (menopause). During this age range, on average, women get menstruation once in 28 days, in which they will experience shedding of blood (from the vagina) for about 1–7 days. Thus it is estimated, on average, women undergo the experience of menstruating for about six to seven years.[1-3] In the Indian context, though the age at menarche used to be celebrated as a function in the case of an adult or young girl, it is surrounded by several taboos, myths, and misconceptions, and thereby, the menstruation period is treated as impure. These, in turn, lead to not keeping up appropriate menstrual health. But following applicable healthy practices or cleanliness of the body in general and external genitals in particular during menstruation (widely known as menstrual hygiene) is essential among women not only from the point of personal hygiene but also keeping up sexual and reproductive health. Menstrual hygienic practices include using a material for absorbing blood during menstruation and cleaning of genitals and include a variety of other aspects such as disposing of absorbed material, bathing practices, etc. Research evidence in India has established...
that absence of or sticking to poor menstrual hygienic practices would cause specifically menstrual and gynaecological problems or reproductive problems at large.\[4-8\]

In India, several studies focused on menstrual hygiene practices among adolescent/unmarried girls\[^{[3,8,13-20]}\] and ever/currently married women of reproductive age group (15–45 years)\[^{[3,8,13-20]}\] rather than among those women in pre-menopausal ages (35–49), who are said to be more vulnerable to gynaecological problems. Further, most of these studies looked into women's awareness and absorbent material (sanitary napkins, tampons, clothes, etc.). Of course, few studies have explored other aspects of menstrual hygiene such as cleaning genitals, bathing practices, type of water/antisepctic material used to clean perineum, etc. Still, scanty attempts\[^{[8,14,17]}\] have been made to study menstrual hygiene practices by constructing an index. On the other hand, only a few studies examined the differentials in menstrual health practices across women's socio-economic characteristics that led to family physicians' unrecognition of women's health issues. In addition, primary care providers can fill the gaps in health care by uplifting women's rights to control their health care by identifying the significant factors that influence such hygienic practices.

**Methods**

**Study design, setting, and participants**

The cross-sectional community-based survey was conducted among married women of pre-menstrual age (35–49 years) living in selected rural areas of Puducherry district, Puducherry Union Territory. The period of the study was January–April 2021. All women in the age group of 35–49 years who had not attained menopause and given consent to participate in the study were included. Women who had been pregnant within the puerperal period (<42 days of delivery), non-resident (those residing in the study areas for <6 months), suffering from any psychological problem, and seriously ill women (not related to gynaecological morbidities) were excluded from the study.

**Sample estimation and sampling procedures**

The sample size was estimated using Daniel's\[^{[21]}\] formula keeping 36% of the prevalence of reproductive tract infections among reproductive-age women in India with the assumption of 95% confidence interval (CI), 5% margin of error, and 0.05 as absolute precision. Further, with a design effect of 2.0 and to compensate for 10% of the non-response rate of the determined sample, the calculated final sample size arrived at was 780. Multi-stage sampling was employed for the selection of the sample women. Based on the probability proportionate sampling technique, 30 villages out of two communes were selected from the Puducherry district at the first stage. Next, in each of these 30 villages, 100 households (in which eligible sample women were found) were listed through household survey, which was considered clusters or Primary Sampling Units for a further selection of samples. Then, 26 sample women (respondents) were selected from these 30 clusters (or PSUs) based on simple random sampling. Thus, in all, a sample of 780 women was selected and interviewed for this study.

**Data collection procedures**

The required data was collected from the respondents by administering a semi-structured schedule with a face-to-face interview method. As the original study was the first author's research work, extensive information about sociodemographic, economic, cultural practices related to menstruation, menstrual hygiene practices, menstrual problems, and gynaecological problems from which the women were suffering was collected. While the interview schedule was prepared in English, it was translated into the Tamil language (with local vocabulary), spoken by most of the people in the study area.

**Ethical considerations**

At first, the researcher got proper ethical clearance from the Institutional Research Board, Indian Institute of Health Management and Research (IIHMR) University, Jaipur. As part of the interview schedule, the researcher read the consent statement to all sample women highlighting the importance of the study and risks and benefits before starting data collection, and interviewed those willing to participate voluntarily by giving oral consent. They were further assured that their self-respect and privacy, the confidentiality of information provided, etc., would be taken care of by not citing names and addresses. Respondents were also informed about their full right to participate or withdraw from the study at any stage, as well as skip or not to give information for any question (s) if they feel embarrassed or unwilling to.

**Variables and statistical analysis**

For the present paper, the dependent variable considered was the menstrual hygienic practices index, which was arrived at by cumulative scores assigned to the responses [as shown in Table 1] for eight specified practices used to follow during menstruation. The pooled score ranged between 3 and 15. This summed score denotes that the higher the score, the higher the woman's menstrual hygiene and vice versa. Selected sociodemographic factors of the study participants [Table 2] were treated as the independent/explanatory variables. Data were processed using the Statistical Package for Social Sciences (popularly known as SPSS) version 20.0. While carrying out the analysis, the descriptive study was first done in terms of frequency tabulations (with percentages and frequencies) for all the sociodemographic characteristics of women and their menstrual hygiene practices. Then the bivariate analysis was carried out to examine the associations (or differentials, if any) between the mean score of menstrual hygiene practices (index) across the independent variables under study. At this juncture, the one-way ANOVA and t-test of significance were adopted to see the strength of association between independent variables and dependent variables. At the final stage, multiple linear regression analysis was performed, including all the variables under study. All of them were theoretically important and found to be significant at 0.05 level or above in the bivariate analysis.
Table 1: Menstrual hygiene practices of study women (n=780)

| Menstrual Hygiene Practices | n (%) | Score |
|-----------------------------|-------|-------|
| Frequency of cleaning perineum |       |       |
| While taking a bath only   | 28 (3.6) | 0   |
| After voiding urine and defecation | 344 (45.8) | 1   |
| Whenever feel discomfort   | 163 (20.6) | 2   |
| The material used to clean the perineum |       |       |
| Cold water                 | 564 (72.3) | 0   |
| Hot water                  | 102 (13.1) | 1   |
| Soap with cold/hot water   | 114 (14.6) | 2   |
| The procedure of Cleaning Perineum |       |       |
| Wash from back to front    | 47 (6.0) | 0   |
| Wash both the sides        | 115 (14.7) | 1   |
| Wash from front to back    | 618 (79.2) | 2   |
| Type of perineum pads used |       |       |
| Old clean cloth/underskirt | 283 (36.3) | 0   |
| Old clean cloth and sanitary pads | 62 (7.9) | 1   |
| Sanitary pads              | 435 (55.8) | 2   |
| Frequency of changing pads |       |       |
| Only once                  | 56 (7.2) | 0   |
| Morning and evening        | 279 (35.8) | 1   |
| Whenever the pad is soaked | 445 (57.0) | 2   |
| The procedure of disposing of pads after use |       |       |
| Wash and reuse it          | 262 (33.6) | 0   |
| Thrown into dustbin        | 155 (19.9) | 1   |
| Burn and Buried            | 363 (46.5) | 2   |
| The practice of taking a bath during menses |       |       |
| One time                   | 640 (82.1) | 0   |
| Two times                  | 130 (16.7) | 1   |
| Three or more Times        | 10 (1.3) | 2   |
| Days after menses participate in sex |       |       |
| ≤4                         | 226 (29.0) | 0   |
| 5-6                        | 226 (29.0) | 1   |
| 7+                         | 328 (42.0) | 2   |

### Results

**Menstrual hygiene practices**

Among the sample women, a more significant majority were used to taking a bath only once a day during menstruation (82%), followed by the practice of cleaning perineum from front to back (79%) and with cold water only (72%). In contrast, a decent majority of them had the habits of changing pads whenever they soaked (57%), followed by cleaning perineum after voiding urine and defecation (56%) and using sanitary pads during menstruation (56%). On the other hand, a simple majority of the sample women were of the practice of burning and burying perineum pads/material (46.5%) and participating in sex in or after seven days of menstruation [Table 1]. Based on the median cumulative score (range 3–15, Median = 9.0), one can make out that 56% of them were practising good hygienic practices during menstruation (poor score nine or above), and 44% of them were said to be under poor menstrual hygiene (scores 3–8; data not given).

**Sociodemographic characteristics of study women**

Out of the total sample of women [Table 2], the majority were in the age group 35–39 years (44.7%), educated up to middle school and high school level (25.9% & 28.6%, respectively), and homemakers and working as labourers (43% and 34%, respectively). Most of them belonged to families that had monthly income brackets of ₹ 12,001–18,000 and ₹ 18,001–24,000 (28.3% and 27.7%, respectively), relatively smaller in family size (<4 members; 69.7%) and belonged to non-scheduled castes/tribes (66.7%).

In the present study, exposure to mass media (index) of respondents was computed based on scores assigned to answers to the frequency get through the following mass media channels, viz., reading newspapers/magazines, watching television, listening to radio/transistor/mobile phone, browsing through...
Facebook/WhatsApp, and going to the cinema (No/Ne ver = 1, Rarely/Occasionally/Monthly = 2, and Weekly/Daily = 3). Based on the pooled score for each respondent (range between 0 and 12), they were categorised into three levels of mass medial exposure [Table 2]. A simple majority of them (41.3%) were said to be having moderate exposure to mass media (score 6–8) followed by lower exposure (score 0–5; 39%), whereas about one-fifth of them (19.6%) had a pretty high exposure to mass media (score 9–12).

The freedom of movement of women (index) was measured based on the responses elicited for four common aspects of their activity from home and assigned the scores on the following lines: ‘going to market’, ‘going to health facility’ and ‘going to outside village/community’ (not at all = 1, with someone = 2, and alone = 3) and ‘frequency of visiting parents’ home’ (Rarely/Once in a year = 1, Two or more times in a year = 2, and Often = 3). Based on these pooled scores (range 4–12), a large number of the respondents (70.3%; scores 9–12) were stated to be having a ‘higher’ extent of freedom of movement [Table 2], and the rest had such freedom to a ‘lower’ extent (29.7%; scores 4–8).

Respondents’ access to economic resources was calculated based on the scores assigned to the replies given to three of the following aspects, viz., having a bank account (No = 1 and Yes = 2) and property under their name (No = 1 and Yes = 2), and a person who keeps the money for household expenditure (Husband and Others = 1 and Husband and Respondent = 2). Based on some of the scores of these aspects (score range 0–6), respondents were categorised as those who had lower access (score 0–4; 90%) and higher access (score 5–6; 10%) to economic resources.

### Associations between background characteristics and menstrual hygiene practices

Bivariate analysis results [Table 2] demonstrated that the extent of women maintaining hygienic menstrual practices (mean scores) appeared to be increasing with an increase in their level of education, occupational hierarchy, family monthly income and exposure to mass media, and also found to be higher among those who belonged to non-SC/ST castes, have had more increased access to economic resources and freedom of movement than their counterparts. Conversely, such practices were observed to be to a lesser extent among the women of higher age group (45 years and) and decreasing trend with a total number of family members. In all these regards, the one-way ANOVA/t-test results turned out as statistically significant at different levels.

The multiple linear regression analysis results [Table 3] reiterated the significant positive role of years of schooling (P < 0.0001), hierarchical order of occupation (P < 0.0001), the extent of exposure to mass media (P < 0.001), family monthly income (P < 0.05) and higher access to economic resources (P < 0.05). As seen earlier, the family size had demonstrated a negative effect on menstrual health practices (P < 0.05). On the other hand, the net effects of age, caste, and extent of freedom of movement on hygienic menstrual practices turned out as insignificant.

### Discussion

On the whole, this study highlights that pre-menopausal aged women living in rural areas of Puducherry practice menstrual hygiene to a relatively greater extent. 56% of the sample women were using sanitary pads during menstruation, which was found similar to the studies conducted among women of Kanpur (58.5%),[16] Mumbai slums (65%),[18] Indore (63%),[19] rural setting of Bihar (68%),[20] and urban Kolkata (72%).[6] whereas much higher among the women of south-west Delhi (91%).[17] On the other hand, the corresponding practice was comparatively lower among those women visiting a hospital in Chennai (42%) and rural setting of Tamil Nadu (35%).[13] as well as among the women of all India – National Family Health Survey, 4 (NFHS-4), 2015-16 (49%).[19]

It was further found that the practice of burning or burying, or throwing into the dustbin of used pads/absorbing material was relatively at a modest extent among the study participants (66.4%). This percentage was somewhat nearer to one noted by Geethu et al[16] in Chennai (78%), whereas a similar figure was observed as a little lower according to a few studies (50% each).[13,14] On the other hand, some studies[6,13,17] reported similar practices as strikingly high (96%–100%).

Another hygienic practice during menstruation, cleaning external parts of genitals with soap and water/antisepsics, was strikingly lower among the study women (14.6%). However, this figure was noted as quite high (range: 33%–64%) in many studies conducted in India.[6,13,14]

However, the point to be noted here is that all these practices mainly depend upon the availability of water and economic conditions/access to monetary resources of the women/family, in addition to rural-urban and slum and non-slum areas (as an environmental factor) as well as women’s awareness and interaction with other women which paved the way to identify...
the determinants and rule out the root cause of women health issues by primary health care providers.

When the associations (and net effects) of general menstrual hygienic practices (index) with the background factors of women were examined, it was pertinent to note that women's education, occupational hierarchy, and family monthly income turned out to be the key predictors. Several studies conducted in India[9,14,20] also reported the significant association of women's education and household wealth index/SES with one or the other menstrual hygiene practices—mainly using sanitary napkins well as sound/poor menstrual hygiene index. However, in the case of occupational status (primarily skilled workers and employed), the studies by Balamurugan et al.[3] and Kumar et al.[17] noted good/satisfactory hygienic practices during menstruation to a greater extent among women, whereas the study by Roy et al.[19] showed a lower degree of sanitary pad use among working women. The latter finding could be since the sample women were young (15–24 years) and further, among whom the share of employed was much less (18%). They were also primarily engaged in agricultural and household industry-related works.

Another significant finding of this study was the positive role of women's exposure to mass media on menstrual hygiene practices. An almost similar finding was established by analysing NFHS-4 data for India.[9] It Empowered Action Group (EAG) states.[18] District Level Health Survey, 3 (DLHS-3) data for all India[6] and also a micro-level study in Chittoor district of Andhra Pradesh.[14] This study also confirmed that family size (number of family members) impedes women's menstrual hygienic practices. This finding was consistent with a survey by Bhusal[22] in Nepal, wherein a significant negative association was observed between the size of the family and good menstrual hygienic practices. Likewise, two studies from India[9,14] demonstrated that women who were part of the nuclear family (wherein several family members would be less) had practised menstrual hygiene to a greater extent.

The bivariate results of this study highlighted that the extent of hygienic menstrual practices was greater among the general castes and backward castes (who were generally better in socio-economic conditions) than those who belonged to Scheduled Castes/Tribes (relatively deprived in terms of socio-economic status). In India, an almost similar finding was observed in three micro-level studies[9,14,20] and at the national level (NFHS-4).[9]

Consistent with the earlier studies by Nath and Nath[3] and Kathuria and Raj,[19] the magnitude of hygienic menstrual practices was poor among women belonging to the last part of their reproductive age (40–44 and 45–49 years) than their counterparts. The analysis of NFHS-4 data for young (15–24 years) married women,[9] Manorama et al.[22] displayed the positive role of women's autonomy in enhancing hygienic menstrual practices; in this study, women's freedom of movement (a proxy for women's liberation) was found to be increasing their menstrual hygiene.

Conclusions

The overall menstrual hygienic practices of rural pre-menopausal women were modest. Therefore, many efforts are needed to improve such a situation shortly. The education and economic background of the family demonstrated their positive role in increasing the hygienic menstrual practices, and added to this exposure to mass media also played a vital role in that direction. Strategies like informal education through those women who were aware of good menstrual hygienic practices, providing appropriate income-generating activities to women and members of the family that increase their family income, besides imparting various correct (reasonable) procedures to be followed during menstruation through different media channels may be designed and executed particularly for rural women. Thus the study on determinants of menstrual hygiene practices among middle-aged pre-menopausal women in Puducherry was able to unfold the health issues on women's health.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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