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ORIGINAL ARTICLE

PATTERNS AND PRACTICES ON MENSTRUAL HYGIENE AMONG RURAL AND URBAN ADOLESCENT GIRLS IN TAMIL NADU: A CROSS-SECTIONAL STUDY

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INTRODUCTION

Adolescence is derived from Latin word 'Adolescere' which means 'to grow up'. Adolescents are individuals between 10 and 19 years of age1. They represent 16% of the world's population and 18% of Indian population. Adolescence period is categorized as early adolescence (10-14 years) and late adolescence (15-19 years). During early adolescence, physical changes begin with growth spurt and development of the sex organs and secondary sexual characteristics. In the late adolescence period, the major physical changes have occurred by now and the psychological changes develop.[2]

Adolescence in girls is a special period as it the period of psychological and physical preparation for safe motherhood and is characterized by onset of menstruation (menarche) in girls. Menstruation, and the menstrual cycle are characterized by variability in volume, pattern and regularity. The onset of menstruation is between 10 years and 16 years of age, though its timing may vary depending on nutritional, sanitary, and socioeconomic conditions. Throughout the childbearing years of the women, it remains as a normal physiological phenomenon indicating woman's reproductive health and the capability of procreation and cease at menopause approximately between the ages of 45-55 years. The menstrual cycle is often irregular during first two years after menarche due to anovulatory cycles because of immature hypothalamic–pituitary–ovarian axis, but regular menstrual cycle becomes established by the third year after menarche.[3,4,5]

Menstrual hygiene relates to the health care needs and requirements of women during menstrual cycle. UNICEF defined Menstrual hygiene Management (MHM) as 'women and adolescent girls using a clean menstrual management material to absorb or collect blood that can be changed in privacy as often as necessary for the duration of menstrual period, using soap and water for washing the body as required and having access to facilities to dispose of used menstrual management materials. Thus, use of sanitary pads and adequate washing of the genital area are the essential good hygienic practices during menstruation which can protect the health in the long run.[6] Gynecological and reproductive tract infections are more likely in poor hygienic practices and unsafe sanitary conditions. There is a substantial lacuna in menstrual hygiene practices among adolescent girls and differences in menstrual hygiene practices based on spatial differences exist. Hence this study is attempted to compare the menstrual hygiene patterns and practices among adolescent girls in rural and urban field practice area of tertiary care teaching hospital in Tamil Nadu.

METHODS

This is a community based analytical cross-sectional study conducted among adolescent girls aged 11-19 years age residing in the urban and rural field practice areas of Karpaga Vinayaga Institute of Medical Sciences & Research Centre, Tamil Nadu during August 2017 to October 2019.

SAMPLE SIZE AND SAMPLING: Based on a study by Barathalakshmi et al., where 37.7% of girls followed good menstrual hygiene practices, the required sample size was calculated with a 5% allowable error and 10% non-response rate, yielding 410 participants. Using probability proportional to size, the sample was distributed as 273 adolescent girls from rural areas and 137 from urban areas; ultimately, the study

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was carried out among 256 rural and 137 urban participants.

STUDY TOOL: Semi structured questionnaire containing the details on socio-demographic characteristics, age of menarche, patterns and problems, hygiene practices and restrictions during menstruation.

DATA COLLECTION: Adolescent girls were visited at their houses and questionnaire was administered by one-on-one direct interview method. Assent from adolescent girls and consent from their mothers was obtained.

OPERATIONAL DEFINITION: Adolescent girls who changed pads ≥ 3 pads/ day, used disposable sanitary pads or clean cloth, took bath daily, cleaned their external genitalia with soap and water daily during menstruation, were considered to have followed good menstrual hygiene practices.

DATA ANALYSIS: The data obtained were entered in Microsoft Excel sheet and analyzed using SPSS. Quantitative variables were summarized as mean and standard deviation or median and interquartile range. Qualitative variables were summarized as Percentages/proportions. Chi square test was used as the test of significance for categorical variables. Menstrual hygiene practices were assessed using four items. Those who practiced all the 4 were considered to have followed good menstrual hygiene practices and the remaining were considered to have inadequate practice on menstrual hygiene.

ETHICAL ISSUES: Ethical clearance was obtained from the Institutional Ethical Committee (IEC) of Karpaga Vinayaga Institute of Medical Sciences and Research Centre, Tamil Nadu.

RESULTS

Table 1. Socio Demographic characteristics of study participants

Variables	Rural (N= 256) n (%)	Urban (N=137) n (%)	Total N=393 n (%)
Family type			
Nuclear	163 (63.67)	100 (73)	263 (66.92)
Joint family	55 (21.48)	35 (25.5)	90 (22.9)
Three generation family	38 (14.84)	2 (1.5)	40 (10.18)
Study place			
Government	51 (19.9)	15 (10.9)	66 (16.79)
Private	205 (80.1)	122 (89.1)	327 (83.21)
Toilet facility at home	198 (77.34)	137 (100)	335 (85.24)
Toilet facility at study place	256 (100)	137 (100)	393 (100)

Age of the participants ranged from 11-19 years, with the mean age of 15.58 ±2.22 years (15.83±2.30 years in rural area and 15.13 ±1.99 years in urban area). Majority belonged to nuclear family in rural (63.67%) and urban (73%). Regarding the place of education, 80.1% of the adolescent girls in rural and 89.1% in urban were studying in private institutions. All the girls in urban had toilet facility at home, whereas 198 (77.34%) girls in rural had toilet facility at home. [Table 1]

Table 2: Patterns and practices during menstruation among study participants

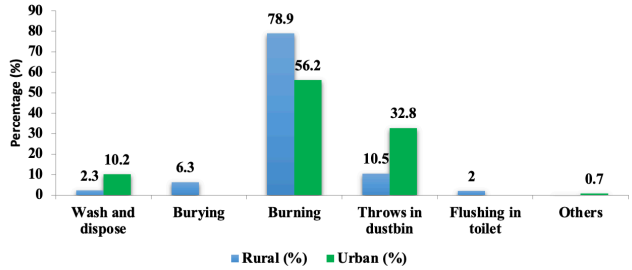
Variables	Rural (N= 256) Frequency (%)	Urban (N=137) Frequency (%)	Significance
Age at menarche in years [mean ±(SD)]	**12.53 (1.19)**	**11.98 (1.09)**	**4.91 (<0.001)***
Frequency			
Once a month	215 (83.98)	119 (86.9)	
Once in 2-3 weeks	10 (3.91)	4 (2.9)	1.06 (0.79)
Once in 4-5 weeks	6 (2.34)	4 (2.9)	
Others/ Irregular	25 (9.77)	10 (7.3)	
Days of bleeding in each cycle [median (IQR)]	5 (2)	5 (2)	
Amount of flow			
Scanty	15 (5.86)	6 (4.38)	
Normal	192 (75)	117 (85.4)	**11.031 (0.001)***
Excess	49 (19.14)	14 (10.22)	
Type of absorbent used			
Sanitary pads	256 (100)	137 (100)	
Bathing daily during menstruation			
Yes	256 (100)	137 (100)	
Washing genitalia during menstruation			
Water only	45 (17.58)	27 (19.71)	0.27 (0.6)
Water and soap	211 (82.42)	110 (80.29)	
Number of sanitary pads changed per day during menstruation			
≤2	63 (24.60)	40 (29.20)	0.97 (0.32)
≥3	193 (75.39)	97 (70.80)	
Overall practice			
Good practice	160 (62.5)	90 (65.69)	0.393 (0.53)
Inadequate practice	96 (37.5)	47 (34.31)	

Patterns and practices of menstruation:

The mean age at menarche in rural area was 12.53±1.19 years, whereas in urban, it was 11.98±1.09 years, the difference of which is statistically significant (p<0.001). The length of menstrual cycle was one month in 83.98% girls in rural and 86.9% girls in urban. Regarding the flow, 85.4%

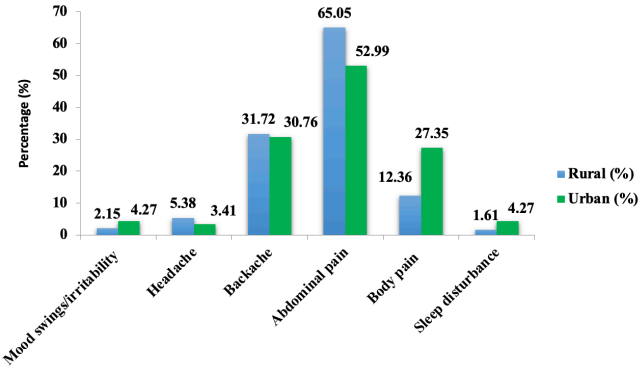
girls in urban area have normal flow of menstruation whereas in rural area, only 75% girls have normal flow, the difference is statistically significant (χ^2=11.031; p value <0.001). The median duration of menstrual flow in both the areas was 5 (2) days.

Figure 1: Methods of disposal of absorbent materials



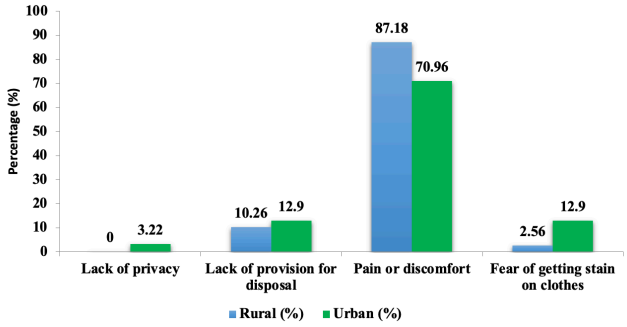
All the girls, both in rural and urban used sanitary pads. All the girls took bath daily during menstruation. Regarding the cleaning of genitalia, 82.42% girls in rural and 80.29% girls in urban area washed the genitalia with soap and water daily during menstruation. More than 70% girls in rural and urban changed 3 or more than 3 pads daily. No statistically significant difference was noted between girls in rural and urban area regarding washing the genitalia with soap and water and number of pads changed daily. Good hygienic practices (changing ≥ 3 absorbents/day, using disposable sanitary pads or clean cloth, took bath daily, cleaned their external genitalia with soap and water daily during menstruation) were followed by 62.5% girls in rural area and 65.69% girls in urban area. The difference was not statistically significant (χ^2 =0.393; p value =0.531). [Table 2] Burning was the most common method of disposal in both rural (78.9%) and urban areas (56.2%) [Fig 1].

Figure 2: Types of Premenstrual /menstrual problems experienced by study participants



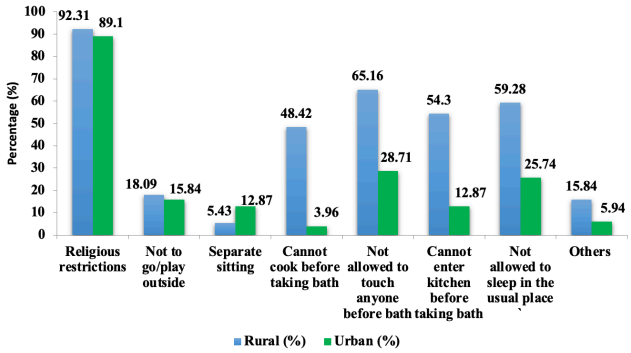
Premenstrual or menstrual symptoms and school absenteeism among adolescent girls: Premenstrual or menstrual problems are more among adolescent girls in urban area (85.4%) than rural area (72.66%) and this difference is found to be statistically significant (χ^2 =8.21; p value <0.001). The most common problem was abdominal pain (65.05% in rural and 52.99% in urban), followed by backache (31.72% in rural and 30.76% in urban) and body pain (12.76% in rural and 27.35% in urban) [Fig 2]. Absenteeism during menstruation was reported by 39 (15.23%) girls in rural and 31 (22.63%) girls in urban, which was not statistically significant (χ^2 3.33; p 0.07). Pain or discomfort (87.18% in rural and 70.96% in urban) was the most common reason [Fig 3].

Figure 3: Reasons for school absenteeism



Restrictions practiced during menstruation: Restrictions were practiced by 221 (86.3%) girls in rural and 101 (73.72%) girls in urban areas. This difference was significant statistically (χ^2=9.580, p value-0.002). Among the 221 (86.3%) adolescent girls who practiced restrictions in rural, 92.31% were not allowed to attend religious restrictions, 65.16% were not allowed to touch anyone before taking bath, 59.28% were not allowed to sleep in the usual place, 54.3% were restricted from entering kitchen before taking bath, 48.42% were not allowed to cannot cook before taking bath.

Figure 4: Types of restrictions practiced by adolescent girls



The other restrictions (15.84%) were: not allowed to touch plants or to feed animals. Among the 101 (73.72%) girls who practiced restrictions in urban, 89.1% were not allowed to participate in religious activities, 28.71% from touching anyone before taking bath and 25.74% were restricted from sleeping in the usual place [Fig 4].

DISCUSSION

In the present study, the mean age at menarche in rural area was 12.53±1.19 years, whereas in urban, it was 11.98±1.09 years, which is similar to a study done by Senapathi P[8] in Mangaluru Karnataka where it was 12.71 ± 0.67 Years in rural and 12.57 ± 0.73 Years in urban area.

In this study, normal menstrual flow was reported by 75% girls in rural and 85.4% girls in urban. Similarly, Ali TS[9] in urban Karachi, Pakistan reported that 70% girls had normal menstrual flow. The number of days of menstrual flow was 5 days in 31.25% girls in rural and 40.1% girls in urban in this study, while Jogdand K[10] in a slum in Guntur reported 15.96% girls had blood flow for more than 5 days. In another study, Devi RU[11] in a rural area in Kancheepuram, 20% girls reported having menstrual flow for more than 5 days.

In this study, menstrual or premenstrual symptoms were experienced by 72.66% girls in rural and 85.4% girls in urban. Abdominal pain was experienced by 65.05% girls in rural and 52.99% in urban. Similarly in Tamil Nadu, Jothy K[12] in rural areas of Cuddalore, Barathalakshmi J[7] in urban Chidambaram and Priya SS[13] in rural area of Salem reported that 78.8% and 75.6% and 94.6% girls respectively experienced abdominal pain. In Indian context, Agarwal N[14] reported that 59.7% girls in a rural area in Chhattisgarh had abdominal pain and Kumar K[15] in Bihar reported 79.5% girls in rural area had abdominal pain. Problems during menstruation were reported by adolescent girls in other countries. Alosaimi JA[16] in a city in Saudi Arabia reported that 57.6% experienced abdominal pain.

All the girls in this study (rural and urban) reported that they used sanitary pads only which was considered as one of the good hygienic practices. Similarly, Iswarya S[17] in an urban area in Coimbatore reported 100% sanitary pads usage among adolescent school girls. Barathalakshmi J[7] in urban Chidambaram and Seenivasan P[18] in urban Chennai, Tamil Nadu reported sanitary pads usage among 90.5% girls and 92.6% girls respectively. In other states, Kumar P[19] in Uttar Pradesh reported sanitary pads usage in 35.1% rural and 62.5% urban girls. Mohanty S[20] in urban slums of Odisha, Ramachandra K in urban Bangalore K[21], Kapoor G[22] in rural Jammu and Kumar K[15] in rural Bihar reported pad usage as 56.8%, 69%, 59% and 70% respectively. Whereas Chauhan P[23] in rural Telangana reported 97% sanitary pads usage among adolescent girls.

In the context of changing pads per day, 36.33% girls in rural changed 4 pads per day and 37.23% in urban changed 3 pads per day. Fehintola FO[24] in a city in Nigeria reported that 19% changed the materials three or more times. Mohanty S[20] in urban slums of Odisha reported that 20% girls changed the absorbent only once a day. In Telengana, Chauhan P[23] reported that 52% girls in rural changed twice and 43.6% changed more than twice a day. Parle J[25] in rural Maharastra reported that 49.2% girls changed the pads twice daily. Iswarya S[17] in study at urban Coimbatore reported that 61.5% girls changed 2-3 pads per day and 38.5% changed more than 4 pads per day.

In the present study good hygienic practices were followed by 62.5% girls in rural, 65.69% girls in urban and inadequate practice were found in 37.5% in rural, 34.31% urban while Barathalakshmi J[7] in urban Chidambaram, Tamil Nadu reported that only 37.7% girls were following good hygienic practices. Parle J[25] in rural Maharashtra reported that 47.1% followed good practice and 52.8% girls had poor practice and during menstruation. In a city in Iran, Siabani S[26] reported poor practice among 81% girls and in a study by Upashe SP[27], in a town in Western Ethiopia 39.9% girls followed good practices on menstrual hygiene.

In this study, the methods of disposal of used absorbent material were burning (78.6% in rural and 56.2% in urban), throwing in dustbin (urban 10.5%, urban 32.8%), washing and disposing (urban 10.2%, rural 2.3%), burying (rural 6.3%) and flushing in toilet (urban 2%). Similarly, Kumar P[19] in Uttar Pradesh reported that 47.8% girls in rural and 33.5% girls in rural disposed by burning. Thakre SB[28] in Nagpur reported that 52.2% girls disposed by burning (rural 60.96%, urban 46.89%), 39.79% disposed along with the routine waste and 6.72% used other methods of disposal. Deepa S[29] in a study at rural areas of Coimbatore, Erode and Tiruppur reported that 48.5% practiced burying as a method of disposal. Kapoor G[22] in rural Jammu reported that 70.45% were throwing with routine waste and 7.58% burnt the used material.

Absenteeism during menstruation was observed in 15.23% girls in rural and 22.63% girls in urban in the present study. In contrast, Kumar P[19] in Uttar Pradesh reported as 44.7% in rural and 40.9% in urban. Alosaimi JA[16] in Saudi Arabia reported 27.2% absenteeism and Chauhan P49 reported 32.7% absenteeism in rural Telangana. Varghese MM[30] in Porur, Chennai urban reported 5.4% absenteeism while Parameaswari PJ[31] reported 30.1% in urban Chennai, Tamil Nadu.

Restrictions during menstruation were practiced by 86.3% girls in rural and 73.72% girls in urban areas. Restriction regarding religious activities was the most commonly practice, rural (92.31%) and urban (89.1%). Similar results

were shown by Barathalakshmi J[7] in urban Chidambaram where 98.6% were not allowed to visit temple and Parle J[52] in rural Maharashtra where 88.9% girls were prevented from visiting holy places. On the contrary, Fehintola FO[28] in a city in Nigeria reported that 45.75% girls were restricted from attending celebration and festivities.

Regarding food restrictions, 47.27% girls in rural and 59.9% girls in urban areas avoided foods such as non-vegetarian foods, sweets, papaya, mango and curd, whereas Fehintola FO[24] in a city in reported that 17.92% restricted certain foods during menstruation. In a study at Chennai by Varghese MM30, food restriction was reported by 69.3% girls. Jothy K[12] in rural Cuddalore reported that 49.7% avoided certain foods such as sour foods, papaya, radish and non-vegetarian dishes during menstruation. There was a significant difference in restrictions practiced in rural and urban areas. Also, the restrictions practiced were higher among Hindus (rural 95.5%, urban 83.81%) than other religions. This shows that religion was significantly associated with restrictions both in rural and urban areas. Varghese MM30, Chennai also reported that religious restrictions were more common among Hindus. This may be because restrictions are believed to be part of religion in India.

CONCLUSION

This study highlights important differences in menstrual patterns and hygiene practices between rural and urban adolescent girls in Tamil Nadu. The mean age at menarche was earlier among urban girls, likely reflecting better nutritional and living conditions compared to their rural counterparts. Menstrual and premenstrual problems were more frequently reported by urban girls. Notably, all participants in both rural and urban areas reported the use of sanitary napkins, a key component of good menstrual hygiene. This reflects the significant role of the Menstrual Hygiene Programme in Tamil Nadu, implemented under the Rashtriya Kishor Swasthya Karyakram (RKSK), which aims to promote menstrual hygiene among adolescent girls aged 10–19 years in rural areas. However, overall adherence to good hygiene practices was suboptimal in both settings, indicating that the programme needs to be strengthened beyond the supply of sanitary napkins. Burning was the most common method of sanitary pad disposal, despite being an unsafe practice with environmental concerns. School absenteeism during menstruation was significant in both groups, underscoring the impact of menstruation on educational participation. Restrictive practices were more common in rural areas, although religious restrictions were widely observed across both rural and urban populations.

The findings emphasize the urgent need for targeted menstrual health education that dispels myths and taboos, promotes safe and hygienic practices, and encourages sustainable disposal methods. Schools, health workers, and community platforms can serve as effective channels for disseminating accurate information and fostering supportive environments.

At the policy level, ensuring access not only to affordable menstrual products but also to safe and sustainable disposal facilities is critical. Strengthening menstrual hygiene management is vital not only for improving reproductive health outcomes but also for empowering adolescent girls, reducing school absenteeism, and supporting their long-term educational and social development.

CONFLICT OF INTEREST

None

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