

# Menstrual cycle pattern in adolescent girls among urban and rural regions – A comparative cross-sectional study

Kanmani Karthikkeyan<sup>1</sup>, Nirmala N<sup>2</sup>, Thirumalai Kolundhu S<sup>3</sup>, Charumathi V<sup>4</sup>, Santhosini V<sup>1</sup>

<sup>1</sup>Department of Physiology, Government Stanley Medical College, Chennai, Tamil Nadu, India, <sup>2</sup>Department of Physiology, Government Madras Medical College, Chennai, Tamil Nadu, India, <sup>3</sup>Department of Medicine, Government Madras Medical College, Chennai, Tamil Nadu, India, <sup>4</sup>Department of Physiology, Government Thiruvavur Medical College, Thiruvavur, Tamil Nadu, India

Correspondence to: Santhosini V, E-mail: santhosinivasudevan@gmail.com

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## ABSTRACT

**Background:** The term adolescence involves the period of various changes in the body of both males and females, which includes physical, mental, cognitive, developmental, and socio-behavioral changes. The period of adolescence starts from the age of 10 years and it lasts until the age of 19 years. The age at menarche in girls usually ranges between 14 and 16 years. **Objective:** This study was aimed to assess the various pattern of the menstrual cycle in adolescent girls and to compare the menstrual cycle pattern among rural and urban girls. **Materials and Methods:** It was a cross-sectional study conducted among 868 adolescent girls after obtaining Ethical Committee Clearance. After obtaining informed written consent, a questionnaire was explained to them in their native language for easy understanding. The questionnaire was structured to obtain information relating to the age at menarche, duration of bleeding, severity of bleeding, awareness of menstruation, source of information about menstruation, cultural practices during menstrual cycles, regarding various menstrual problems, and treatment practices among the study population. The data thus obtained were tabulated and analyzed statistically using SPSS software. **Results:** There was a statistically significant ( $P \leq 0.05$ ) difference present between rural and urban girls' menstrual cycle pattern with respect to dysmenorrhea, premenstrual symptoms, and problems related to menstrual flow and menstrual practices such as diaper usage, home culture, and food habits. **Conclusion:** The menstrual cycle pattern differs significantly between rural and urban girls. This analysis shows decreased awareness of the menstrual cycle in rural girls than urban girls. Hence, proper health education can be given to improve their knowledge.


**KEY WORDS:** Adolescent Girls; Menstruation; Premenstrual Syndrome; Rural; Urban

## INTRODUCTION

The term adolescence involves the period of various changes in the body of both males and females, which includes physical, mental, cognitive, developmental, and socio-behavioral changes.<sup>[1]</sup> The period of adolescence starts from the age of 10 years, and it lasts until the age

of 19 years. In general, the girls attain puberty by the age of 14–16 years, which is experienced by the onset of menstruation.<sup>[1,2]</sup>

In developing countries like India, the adolescent girls experience various problems during their menstruation in the form of cultural practices, poor availability of resources, lack of knowledge, nutritional deficiencies, endocrinological disorders, obesity due to the physical inactivity, and other comorbidities.<sup>[2]</sup> The lack of sex education in our school curriculum may be the reason for overpopulation and transmission of sexually transmitted diseases.<sup>[3-5]</sup> It was found that breast cancer was prevalent among girls with a higher number of menstrual cycles.<sup>[6]</sup> To recognize the problems

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experienced by the adolescent girls, this study was carried out with the following objectives:

- To assess the various patterns of the menstrual cycle in adolescent girls
- To analyze and compare the menstrual cycle pattern among rural and urban girls
- To assess the knowledge regarding the menstrual cycle among adolescent girls.

## MATERIALS AND METHODS

This cross-sectional study was carried out in adolescent girls among rural and urban regions, after getting proper approval from the Institutional Ethical Committee, Madras Medical College, Chennai. The study was carried out by giving questionnaires to 868 students for 6 months. None of the subjects were encountered with major health problems, especially reproductive health issues. Unmarried adolescents constitute a major proportion in this age group. Unlike married ones, they have not passed through various reproductive stages such as pregnancy, lactation, and use of contraceptives, and hence, they were considered to be homogenous.

They were explained well about the purpose of the study and prior written informed consent was obtained from them. Questions were explained to them in their regional language also for better understanding. They were informed that the information collected would be confidential. The study tool in this study was a structured and self-administered questionnaire. The questionnaire was structured in such a way to obtain information relating to the age at menarche, duration of bleeding, severity of bleeding, awareness of menstruation, source of information about menstruation, cultural practices during menstrual cycles, regarding various menstrual problems, and treatment practices among the study population.

## Statistical Analysis

Data were collected and entered into MS Excel and analyzed using SPSS software. The categorical variables were expressed in frequency and percentage and analyzed using the Chi-square test. The continuous variables were expressed in mean and standard deviation.  $P \leq 0.05$  was considered as statistically significant.

## RESULTS

A total of 868 girls in the age group of 17–19 years, with the mean  $\pm$  SD age of  $17.88 \pm 1.64$  years, were studied. The majority of the participants, 517 girls (59.56%), belonged to urban areas. Table 1 revealed that significant differences existed between the various patterns of the menstrual cycle among rural and urban girls. The mean age of menarche was  $13.91 \pm 1.65$  years in rural girls, whereas in urban girls, it was  $12.76 \pm 1.10$ . Homemade diapers were most commonly used by rural girls (13.67%) than urban girls which were statistically ( $P \leq 0.05$ ) significant. The frequency of the menstrual cycle was once in  $29.82 \pm 6.99$  days in urban girls, whereas it was once in  $31.44 \pm 6.10$  days in rural girls. The number of days of bleeding was  $4.48 \pm 1.38$  days in urban girls and  $4.18 \pm 1.26$  in rural girls. The severity of bleeding was moderate in both the population and it varied from cycle to cycle most in the urban girls (50.87%).

Figure 1 shows that among the urban participants, 26 girls had mild flow, 128 girls had moderate flow, 100 girls had severe flow, and 263 had a flow that varies from cycle to cycle. It also compares this with rural participants, among which 44 girls had mild flow, 208 girls had moderate flow, 36 girls had severe flow, and 60 girls had a flow that varies from cycle to cycle.

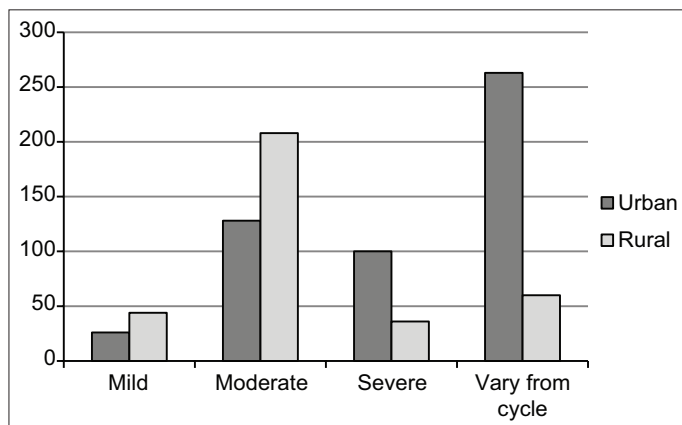
**Table 1:** Menstrual pattern among the study population ( $n=868$ )

Menstrual pattern	Total No. (%)	Urban girls ( $n=517$ ), No. (%)	Rural girls ( $n=351$ ), No. (%)
Age of menarche	13.33 $\pm$ 1.92	12.76 $\pm$ 1.10	13.91 $\pm$ 1.65
Frequency of menstrual cycle	30.63 $\pm$ 6.54	29.82 $\pm$ 6.99	31.44 $\pm$ 6.10
Days of bleeding	4.33 $\pm$ 1.32	4.48 $\pm$ 1.38	4.18 $\pm$ 1.26
Bleeding severity			
Mild	70 (8.06)	26 (5.02)	44 (12.53)
Moderate	336 (38.70)	128 (24.75)	208 (59.25)
Severe	136 (15.66)	100 (19.34)	36 (10.25)
Vary from cycle	323 (37.21)	263 (50.87)	60 (17.09)
Diaper use			
Homemade	64 (7.37)	16 (3.09)	48 (13.67)
Company made	804 (92.62)	501 (96.92)	303 (86.32)
1. Stayfree	275 (31.68)	107 (21.31)	168 (55.44)
2. Carefree	22 (2.53)	18 (3.59)	4 (1.03)
3. Whisper	507 (58.41)	376 (75.04)	131 (43.23)

Table 2 described the various menstrual-related problems, in which the majority of girls had one or more problems related to menstrual cycles. Dysmenorrhea, premenstrual syndrome (PMS), and other issues pertaining to menstruation were reported in the study participants. Abnormal uterine bleeding which lasted for more than 7 days was experienced by 84 girls. Twelve girls also reported that they have their menstrual bleeding for only 2 days. Dysmenorrhea and PMS were significantly more in urban than in rural girls ( $P \leq 0.05$ ). The use of pills for pain was more in urban girls (58.41%) compared to rural girls (21.08%). Other associated illnesses such as anemia, peptic ulcer disease, migraine, and thyroid illness were noted, among which anemia was considerably more in the rural population of about 8.1%.

## DISCUSSION

Menstruation among women of reproductive age group was very important as it contributes to both reproductive and mental health. Establishing the nature of menstrual habits in adolescent girls, the menstrual pattern was found to be different among both rural and urban populations.<sup>[7]</sup> There were studies in the literature comparing the various menstrual parameters among women of various age groups. In our



**Figure 1:** Severity of menstrual flow

study, we have compared various patterns of menstruation in adolescent girls from rural and urban areas.

While comparing the various parameters, it was found that the average age of menarche in rural and urban girls was not found to have much difference. Similarly, the duration as well as the frequency of bleeding had not shown major differences. Zegeye *et al.*, in their study, found that the average age at which the rural girls attained menarche was higher when compared to the urban girls.<sup>[8]</sup>

The rural girls were using homemade diapers rather than the company made due to lack of awareness and availability, which were in consistent with the previous study.<sup>[9,10]</sup>

In the present study, dysmenorrhea, menorrhagia, irregular cycles, using medication for menstrual pain, and premenstrual symptoms such as tiredness, headache, breast pain, breast engorgement, vomiting sensation, mental depression, sleep disturbances, and constipation were found to be more common among urban girls than rural girls. Avasarala and Panchangam, in their study, also found that urban girls had a higher incidence of PMS than urban girls, which were in consistent with the present study.<sup>[11]</sup>

Further, from this study, the rural girls had a lot of menstruation-related problems than urban girls due to their lower socioeconomic status which was also proved by other studies.<sup>[10]</sup>

Other associated illnesses such as thyroid disorders, migraine, anemia and endocrinological disorders were also seen among these people, out of which anemia was found to be more commonly seen in rural girls which might be due to nutritional deficiencies and lower socio-economic status.<sup>[11]</sup>

Moreover, lifestyle modifications such as decreased physical activities and using junk foods, causing obesity and other health-related issues, might be the common cause for dysmenorrhea and premenstrual symptoms in an urban region.<sup>[12,13]</sup>

**Table 2:** Menstrual cycle-related problems among rural and urban girls

Menstrual pattern	Total No. (%)	Urban girls (n=517), No. (%)	Rural girls (n=351), No. (%)
Warmthness	162 (18.66)	102 (19.67)	60 (17.09)
Dysmenorrhea	587 (67.62)	425 (82.12)	162 (46.15)
Premenstrual symptoms	618 (71.19)	384 (74.21)	234 (66.67)
Associated illness			
Peptic ulcer	51 (5.87)	17 (3.2)	34 (9.6)
Thyroid disorder	8 (0.92)	-	8 (2.2)
Migraine	71 (8.17)	25 (4.9)	46 (13.1)
Anemia	67 (7.71)	22 (4.2)	42 (8.1)
Ovarian pain	360 (41.47)	212 (41)	148 (42.16)
Medications for pain	376 (43.31)	302 (58.41)	74 (21.08)
White discharge	749 (86.29)	466 (90.16)	283 (80.62)

In this study, findings were mainly based on the perceptions of the study participants. Hence, there are chances of subjective error and recall bias.

## CONCLUSION

Health education, nutritional supplementation, improvement in personal hygiene, and sanitation must be tried in rural girls to avoid menstrual problems and associated illness, whereas urban girls must undergo lifestyle modification in the form of improved physical activities, avoiding junk foods, etc., who will make them confident in dealing the issues.

## REFERENCES

1. Dhingra R, Manhas S, Kohli N, Mushtaq A. A comparative study of understanding of menstrual process among married women belonging to two ecological settings. *J Hum Ecol* 2007;22:261-5.
2. Joshi BN, Chauhan SL, Donde UM, Tryambake VH, Gaikwad NS, Bhadoria V. Reproductive health problems and help seeking behavior among adolescents in urban India. *Indian J Pediatr* 2006;73:509-13.
3. Grimes DA, Gallo MF, Grigorieva V, Nanda K, Schulz KF. Fertility awareness-based methods for contraception. *Cochrane Database Syst Rev* 2004;4:CD004860.
4. Harlow SD, Ephross SA. What we do and do not know about the Menstrual Cycle or, Questions Scientists could be asking. In: Ebert RH, editor. *Program on Critical Issues in Reproductive Health Publication Series*. New York: Population Council; 1995.
5. AuBuchon PG, Calhoun KS. Menstrual cycle symptomatology: The role of social expectancy and experimental demand characteristics. *Psychosom Med* 1985;47:35-45.
6. Whelan EA, Sandler DP, Root JL, Smith KR, Weinberg CR. Menstrual cycle patterns and risk of breast cancer. *Am J Epidemiol* 1994;140:1081-90.
7. Blake D, Smith D, Bargiacchi A, France M, Gudex G. Fertility awareness in women attending a fertility clinic. *Aust N Z J Obstet Gynaecol* 1997;37:350-2.
8. Zegeye DT, Megabiaw B, Mulu A. Age at menarche and the menstrual pattern of secondary school adolescents in northwest Ethiopia. *BMC Womens Health* 2009;9:29.
9. Juyal R, Kandpal SD, Semwal J, Negi KS. Practices of menstrual hygiene among adolescent girls in a district of Uttarakhand. *Indian J Community Health* 2012;24:124-8.
10. Thakre SB, Thakre SS, Ughade S, Thakre AD. Urban-rural differences in menstrual problems and practices of girl students in Nagpur, India. *Indian Pediatr* 2012;49:733-6.
11. Avasarala AK, Panchangam S. Dysmenorrhoea in different settings: Are the rural and urban adolescent girls perceiving and managing the dysmenorrhoea problem differently? *Indian J Community Med* 2008;33:246-9.
12. Ray S, Mishra SK, Roy AG, Das BM. Menstrual characteristics: A study of the adolescents of rural and urban West Bengal, India. *Ann Hum Biol* 2010;37:668-81.
13. Khanna A, Goyal RS, Bhawsar R. Menstrual practices and reproductive problems: A study of adolescent girls in Rajasthan. *J Health Manage* 2005;7:91-107.

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