

# Age at Menarche and Menstrual Problems Among School-Going Adolescent Girls of a North Indian District

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## ABSTRACT

**Background:** Menstruation and related problems are difficult issues for adolescent girls and are a common reason for consulting healthcare providers. **Objectives:** To study age at menarche and menstrual problems among school girls in Lucknow district of north India. **Materials and Methods:** A cross-sectional study was carried out in urban as well as rural schools of Lucknow district from October 2008 to September 2009. Multistage random sampling was used to select the requisite number of girls. A total of 847 school-going adolescent girls between 10 and 19 years of age were interviewed and examined. Statistical analyses were done using percentage and Chi-square test. **Results:** Out of 847 adolescent girls, 76.7% (650) girls had attained menarche. The overall mean age at menarche was 12.84 (1.4) years. The age at menarche and duration of menstrual flow were significantly associated with place of schools. About one-fourth of the girls in all the three age groups (10-13, 14-16 and 17-19 years) had irregular menstrual cycle. Overall, 73.7% (479/650) girls had dysmenorrhea, with 74.3% (323/435) girls in urban schools and 72.6% (156/215) girls in rural schools. There was no significant association between reproductive tract illnesses and place of schools. **Conclusion:** Menstruation is an important milestone for adolescent girls and menstrual problems are common among adolescent girls. So, there is a need to explain everything correctly about menstruation. It was suggested that a strong need exists for strong health educational activities among the adolescent girls, their parents, and teachers for effective management of menstrual problems among all adolescent girls.

**KEY WORDS:** Adolescent girls, dysmenorrhea, Lucknow district, menstruation

## INTRODUCTION

Menarche is the first menstrual period or first menstrual bleeding. It is the most commonly remembered milestone of puberty for most women that occurs during the period of adolescence.<sup>[1]</sup>

The word 'adolescence' comes from a Latin word '*Adolescere*' meaning 'to grow in maturity.'<sup>[1]</sup> Adolescents are those between the ages of 10 and 19 years.<sup>[2]</sup> Adolescence is a period when physical growth and maturation are accompanied by mental and psychological development.<sup>[3]</sup> This period needs special attention because of the turmoil an adolescent faces due to different stages of development, different circumstances, different needs, and diverse problems. Thus, United Nations Children's Fund (UNICEF)

and United Nation Fund for Population Activities (UNFPA) joined World Health Organization (WHO) and issued a joint statement on reproductive health of adolescents in 1989 to address to their problems.<sup>[1]</sup>

Although, the onset of menstruation is unique to females, menstrual disorders are common.<sup>[4]</sup> Deep-rooted traditions do not allow adolescent girls to realize their rights in many parts of the world. Although menstrual irregularity can be normal during the first few years after menarche, other menstrual signs and symptoms such as amenorrhea, excessive uterine bleeding, dysmenorrhea, and premenstrual syndrome may indicate a pathological condition which requires prompt attention and referral.<sup>[5]</sup> Thus, healthcare providers are of immense importance for these adolescent girls who are going through pubertal transition.<sup>[6]</sup> Healthcare providers have an opportunity to discuss reproductive health issues with mothers and their daughters. Thus, a need was felt to study menstrual

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problems among adolescent school girls in Lucknow district.

The present study was undertaken among school-going adolescent girls with the objective to study age at menarche and menstrual problems among school girls in Lucknow district of North India.

## MATERIALS AND METHODS

The study protocol was submitted to the Institutional Ethical Committee and clearance was obtained. Informed consent of the principals of schools was taken before the study and assent from the selected adolescents was also obtained, before initiation of the study.

The present cross-sectional study was carried out among school-going adolescent girls in Lucknow district from October 2008 to September 2009. An optimum sample size of 847 (593 urban and 254 rural) school-going adolescent girls of Lucknow district, aged 10-19 years, was selected, and the selected girls were interviewed and examined.

Multi-stage random sampling technique was used to select the requisite number of eligible girls.

### First stage

Lucknow district is divided into urban and rural areas. The urban area is spread equally on both sides of Gomti River, known as Cis Gomti and Trans Gomti. According to Nagar Nigam Lucknow, urban area is divided into six zones. From Cis Gomti, two zones were randomly selected, and similarly from Trans Gomti, two zones were randomly selected.

### Second stage

At the second stage, from each zone, one senior secondary school was selected randomly from the listed senior secondary schools. Similarly two blocks were selected randomly from eight blocks of rural Lucknow. From each block, one senior secondary school was randomly selected from the listed senior secondary schools.

### Third stage

At the third stage, students from classes VI to XII of age group 10-19 years were selected. Students within the class were selected through systematic random sampling. In some schools of rural area, the numbers of students in the classes were not enough; therefore, all the students of the class were invited to participate in the study as systematic random sampling was not possible.

A total of six senior secondary schools, four schools from urban area and two schools from rural area, were randomly selected from the listed senior secondary schools. From these schools, 593 adolescent girls from urban schools and

254 adolescent girls from rural schools were selected for the study.

A structured interview schedule was developed and pre-tested on adolescent girls of a school other than the ones selected for the study. The pre-tested schedule was modified after pre-testing and finalized. Data regarding menstruation were collected using pre-tested and finalized interview schedule. A separate room in each school was used for interview. The girls were interviewed separately and privately. The menstrual history was inquired; the exact date of menarche was noted.

## Statistical analysis

Data were entered in Microsoft Office Excel and analyzed with SPSS Version 16.0. Data were analyzed using percentages and Pearson's Chi-square test for normal distribution. *P* values less than 0.05 were considered significant.

## RESULTS

Table 1 shows that out of the total adolescent girls, 76.7% (650/847) girls had attained menarche, 73.4% (435/593) in urban schools and 84.6% (215/254) in rural schools. The overall mean age at menarche was 12.84 (1.4) years, while it was 12.67 (1.4) years in urban schools and 13.19 (1.5) years in rural schools.

A maximum of 48.9% (213/435) and 46.1% (99/215) girls had their menarche between ages 12 and 14 years in urban and rural schools, respectively. About 17.2% (75/435) girls in urban schools and 31.6% (68/215) girls in rural schools had their age at menarche between ages 14 and 16 years. The age at menarche was significantly associated with place of schools.

Table 2 shows that overall about one-fourth of the girls in all the three age groups had irregular menstrual cycle. There were 29.4% (32/109), 25.1% (64/255), and 16.9% (12/71) girls aged 10-13, 14-16, and 17-19 years, respectively, having irregular cycle in the urban district. There was no statistical difference. There were significantly more girls aged 17-19 years with irregular cycle, as compared to the girls in 10-13 year age group and 14-16 year age group in the rural district.

**Table 1: Distribution of age at menarche in adolescent school girls**

Age at menarche (years)	Urban (n=435)		Rural (n=215)		Total (n=650)	
	No.	%	No.	%	No.	%
10-12	147	33.8	48	22.3	195	30.0
12-14	213	48.9	99	46.1	312	48.0
14-16	75	17.2	68	31.6	143	22.0
Total	435	100	215	100	650	100
Mean age (SD)	12.67 (1.4) years		13.19 (1.5) years		12.84 (1.4) years	

$\chi^2=20.09, P<0.001$

Table 3 shows that overall 86.2% (560/650) girls had menstrual flow between 3 and 5 days. In urban schools, 13.1% (57/435) girls and in rural schools 5.1% (11/215) girls had menstrual flow of more than 5 days. Duration of menstrual flow was significantly associated with place of schools.

Overall, 73.7% (479/650) girls had dysmenorrhea, with 74.3% (323/435) girls in urban schools and 72.6% (156/215) girls in rural schools having the condition. Place of school was not significant in relation to the presence of dysmenorrhea.

Table 4 shows that 3.2% (19/593) of the girls in urban schools had reproductive tract illnesses and 3.9% (10/254) girls in rural schools had vaginal discharge. There was no association between reproductive tract illnesses and place of schools.

## DISCUSSION

In the present study, it was observed that the mean age at menarche in rural school girls was 13.19 (1.5) years, which was significantly higher when compared with mean

age at menarche in urban school girls, which was 12.67 (1.4) years. The combined age at menarche was 12.84 (1.4) years.

Joseph *et al.*,<sup>[7]</sup> in a study on adolescent girls in rural India, observed the mean age at menarche to be 13.9 years, and Nair *et al.*,<sup>[8]</sup> in study on unmarried females in rural area of Delhi, observed the mean age at menarche to be at 13.6 years, which were almost similar to the mean age at menarche (13.19 years) of rural school girls in our study. Acharya *et al.*,<sup>[9]</sup> in study on adolescent girls in South Delhi, observed that the mean age at menarche was 13.34 (1.26) years, which was almost similar to the mean age at menarche in urban school girls (12.67 (1.4) years) in our study.

In the present study, it was observed that about one-fourth of the school girls had irregular menstrual cycle. Different studies had reported varying results regarding menstrual cycle irregularity among adolescent girls. Singh *et al.*,<sup>[10]</sup> observed it in 2.3% school girls and Deo *et al.*,<sup>[11]</sup> observed it in 5.69% (9/158) school girls. Joshi *et al.*,<sup>[12]</sup> observed it in 15.9% adolescent girls, Sharma *et al.*,<sup>[11]</sup> in 31.8% (63/198) girls, and Agarwal *et al.*,<sup>[13]</sup> observed irregular cycle in 48.4% adolescent girls.

The menstrual cycle irregularity was more (24.8%, 108/435) in urban school girls when compared with rural school girls where it was in only 18.1% (39/215) adolescent girls, and in the rural schools girls the menstrual cycle irregularity was significantly associated with age. Deo *et al.*,<sup>[11]</sup> in their study on adolescent school girls of urban and rural school girls in Ambohogi, had observed that menstrual cycle irregularity was more in urban school girls (7.95%) than in rural school girls (2.86%).

In the present study, it was observed that duration of menstrual flow was normal (3-5 days) and significantly more in (91.6%, 197/215) rural school girls than in urban schools girls (83.4%, 363/435). Karthiga *et al.*,<sup>[14]</sup> in their study, found that two-thirds (66.39%, 239/360) of the girls had menses for the duration from 1 to 5 days, while the rest reported beyond 5 days.

About three-fourths of the girls in both urban and rural schools were suffering with dysmenorrhea and there was no significant difference in the presence of dysmenorrhea in urban and rural school adolescent girls. Agarwal *et al.*,<sup>[13]</sup> in a study on adolescent girls in Gwalior, had also observed that 79.6% girls were suffering with dysmenorrhea.

In the present study, it was observed that vaginal discharge was the main complaint of (3.4%, 29/847) adolescent

**Table 2: Distribution of adolescent school girls according to menstrual cycle irregularity and age**

Age (years)	Urban (n=435)			Rural (n=215)			Total (n=650)		
	n	No.	%	n	No.	%	n	No.	%
10-13	109	32	29.4	42	7	16.7	151	39	25.8
14-16	255	64	25.1	114	15	13.2	369	79	21.4
17-19	71	12	16.9	59	17	28.8	130	29	22.3
Total	435	108	24.8	215	39	18.1	650	147	22.6

$\chi^2=3.59$ ,  $P=0.165$ ;  $\chi^2=6.49$ ,  $P=0.039$ ;  $\chi^2=1.20$ ,  $P=0.548$

**Table 3: Distribution of adolescent school girls according to duration of menstruation flow and dysmenorrhea**

	Urban (n=435)		Rural		Total	
	No.	%	No.	%	No.	%
Duration of flow						
<3 days	15	3.4	7	3.3	22	3.4
3-5 days	363	83.4	197	91.6	560	86.2
>5 days	57	13.1	11	5.1	68	10.5
Total	435	100	215	100	650	100
Dysmenorrhea						
Present	323	74.3	156	72.6	479	73.7
Absent	112	25.7	59	27.4	171	26.3
Total	435	100	215	100	650	100

$\chi^2=9.91$ ,  $P=0.007$ ;  $\chi^2=0.213$ ,  $P=0.644$

**Table 4: Distribution of adolescent school girls according to other reproductive tract illnesses**

Reproductive tract illnesses	Urban (n=593)		Rural (n=254)		Total (N=847)	
	No.	%	No.	%	No.	%
Lower abdominal pain	5	0.8	2	0.8	7	0.8
Vaginal discharge	19	3.2	10	3.9	29	3.4
Others	4	0.7	-	-	4	0.5
Total	28	4.7	12	4.7	40	4.7

$\chi^2=0.089$ ,  $P=0.766$ ; Fisher's exact test,  $P=1.00$

school girls and there was no significant difference in this complaint between urban and rural school girls. Joshi *et al.*<sup>[12]</sup> observed almost similar findings (5%). Joseph *et al.*,<sup>[7]</sup> in a study on adolescent girls in rural India, observed that nearly one-fifth (19.4%) of all adolescents complained of vaginal discharge.

There is a need of health education for adolescents. This education could be given at school, college, and community level. Further quantitative descriptive studies are required to validate the results of this study. Menstruation management should be the part of curriculum at school and college level.

It was not possible to find the difference regarding menarche and menstrual problems between the school-going and non-school-going students because this was a school-based study.

Menstrual problems are widely prevalent among school-going adolescent girls of urban as well as rural areas of Lucknow district. The age at menarche, menstrual cycle irregularities, and duration of menstrual flow were significantly associated with place of schools. The study provides an indication to implement intensive health educational activities among the adolescent girls, their parents, and teachers for effective management of menstrual problems among all adolescent girls.

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