

# Is menarche really occurring earlier? A study of secondary school girls in Ile-Ife, Nigeria

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## ABSTRACT

**Context:** A secular trend of progressively earlier attainment of menarche has been described in various populations. The existence of this trend in Ile-Ife, Nigeria, has not been documented.

**Aim:** To determine the current age of menarche and its trend in comparison with previous studies among secondary school girls in Ile-Ife, Nigeria.

**Settings and Design:** School-based cross-sectional analytical study.

**Materials and Methods:** Three-hundred secondary school girls in the lower four classes (JSS 1--SSS 1) were studied. Sociodemographic and menstrual data such as cycle length, duration of menstrual flow, and presence of dysmenorrhoea were obtained using a structured self-administered questionnaire. The mean age at menarche was compared with figures from previous local studies to determine the trend in Ile-Ife. Menstrual characteristics were also analyzed.

**Statistical Analysis:** Data was analyzed with SPSS version 20. Means and standard deviations were generated for continuous variables, while frequencies and proportions were determined for categorical variables.

**Results:** Out of the 300 subjects studied, a total of 198 (66%) had attained menarche at the time of this study. Their reported ages at menarche ranged from 11 to 17 years with a mean of  $13.08 \pm 1.61$  years. This was lower than the  $13.98 \pm 1.30$  and  $13.94 \pm 1.31$  years reported in Ile-Ife in 1992 and 1997, respectively. These three figures show a trend of progressive decline in the mean age at menarche. The subjects' mean duration of menstrual flow was  $4.26 \pm 0.87$  days, with 97.5% of them reporting flow of  $\leq 5$  days. Only 22 (11.1%) of the respondents had a cycle length of 28 days. Dysmenorrhoea was reported by 75% of the respondents and 24% reported loss of concentration during periods.

**Conclusion:** Similar to the widely reported secular trend, menarche indeed appears to be occurring progressively earlier in Ile-Ife, Nigeria.

**Key words:** Adolescence; menarche; menstruation; Nigeria; puberty.

## Introduction

Menarche represents an important biological landmark signalling the successful transition from childhood to adulthood accompanied by the onset of reproductive ability.<sup>[1-3]</sup> Some variations have been observed in the mean age of menarche reported in different populations and

these differences are often attributed to a variety of factors including race, heredity, nutrition, socioeconomic status,

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sporting activities, and family size.<sup>[2,4-8]</sup> Additionally, a secular trend of progressively earlier attainment of menarche has been documented in several populations although the reason behind this phenomenon remains unclear. Whether a similar trend exists in Ile-Ife is yet to be determined.

Menstrual cycles are often irregular in the first few years after menarche because they are largely anovulatory. The various psychosomatic symptoms associated with menstruation are also of importance as they may impact significantly on the girls' daily activities. Furthermore, menstrual disorders represent the common pathway of presentation for many clinical conditions, both gynecological and nongynecological.<sup>[2,4-8]</sup> Studies to identify the age at menarche and the normal menstrual patterns of the inhabitants of an area are therefore necessary for patients' education and formulation of clinical guidelines.<sup>[2,4-8]</sup>

Some studies have been conducted in Ile-Ife with the aim of determining the age at menarche among the inhabitants.<sup>[9,10]</sup> Some of these studies however sampled undergraduates, majority of whom had attained menarche several years before the studies were conducted. The quoted age might therefore not be representative of the actual age at menarche as at the time of the study. Sampling older population will likely increase the chances of recollection bias.

The present study was therefore conducted to determine the current age of menarche in Ile-Ife and compare this with previous studies to determine its trend.

## Subjects and Methods

This study was conducted in Ife Central Local Government, one of the two Local Government Areas in Ile-Ife, Osun State. The study area lies at longitude 4°32'E and latitude 7°29'N. The local government has a population of 167,204 (88,403 males and 78,801 females)<sup>[11]</sup> and the major occupations of the inhabitants include farming, public service, craftsmanship, and trading. The population is multiethnic, consisting mainly of Yoruba, Ibo, and Hausa.

Three out of the 16 secondary schools in the local government were randomly selected for this study, namely Seventh-Day Adventist Secondary Schools 1 and 2, and Oluorogbo High School. A written approval was obtained from the zonal education office of the local government. Parental consent was obtained through the respective school authorities and verbal consent was obtained from the participating students. The study subjects comprised of female students from junior secondary class-1 to senior secondary class-1. An estimated minimum sample size of 215 subjects was calculated based on the proportion of females in the population of Ile-Ife.

Data was collected between February and March, 2011, with the aid of a pretested, self-administered structured questionnaire, which was introduced and its various sections explained to the female students in groups prior to its distribution. Communication between respondents was discouraged during data collection and the questionnaires were retrieved immediately after completion to minimize peer influence.

A total of 320 questionnaires were administered to the students. Twenty questionnaires were however not properly completed and were therefore excluded, leaving 300 properly filled questionnaires for analysis. The data collected was analyzed using SPSS version 16.0. means, standard deviations, and simple percentages were determined.

## Results

Out of the 300 respondents analyzed, 192 (64%) were in Junior Secondary School (JSS 1 to JSS 3), while the remaining 108 (36%) were in Senior Secondary School (SSS 1) at the time of this study. The mean age of the respondents was  $13.89 \pm 1.60$  years with a range of nine to 17 years. Their ages followed a normal distribution pattern as shown in Figure 1. A total of 191 of them (63.7%) were aged 14 years and below.

Information relating to the age of the respondents at menarche is shown in Table 1. A total of 198 respondents (66%) had attained menarche at the time of this study and their stated ages at menarche ranged from 11 to 17 years with a mean of  $13.08 \pm 1.61$  years. Although none of the respondents who had attained menarche did so before the age of 11 years, only two of them were yet to do so at 15 years.

We compared the age at menarche obtained in this study with the results of two earlier studies in Ile-Ife in 1992 and 1997 among secondary school girls. A progressively declining trend was observed between the three studies. The linear

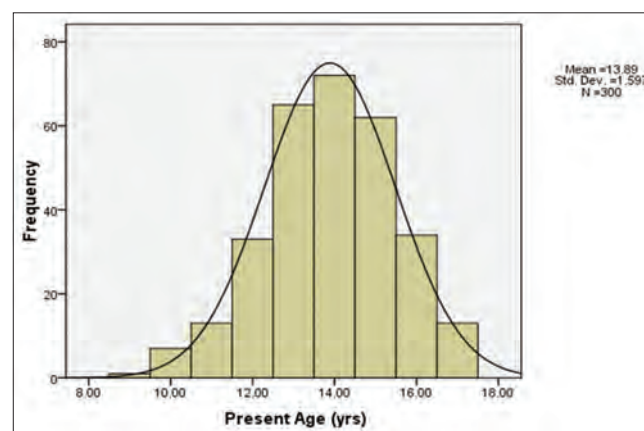


Figure 1: Age distribution of respondents

plot showing the trend of age at menarche over the 20-year period from 1992 to 2011 is shown in Figure 2.

The duration of menstrual flow reported by the respondents ranged from 2 to 6 days, with a modal duration of 5 days. Table 2 shows the distribution of the duration of menstrual flow. Only 2.5% of the respondents had menstrual flow that lasted longer than 5 days. Regarding the length of the menstrual cycle, the most frequently reported cycle length was 30 days (16.7%) as shown in Table 3. Although the mean cycle length was  $27.04 \pm 4.7$  days, only 22 (11.1%) of the respondents reported the frequently quoted 28-day cycle. Table 4 shows the prevalence of dysmenorrhoea among the postmenarcheal respondents. Eighty of them (40.4%) reported having dysmenorrhoea occasionally, whereas 69 (34.8%) experienced it in every cycle. The other symptoms experienced by these girls during their menstrual flow include loss of concentration in 48 respondents (24.2%), insomnia in 31 (15.7%) of the respondents, and headaches in 16 (8.1%) of them. Twenty-five (12.7%) of them experienced nausea and/or vomiting during periods, whereas 12 (6.1%) complained of breast pain. Other symptoms included excessive sleepiness reported by two subjects (1%), whereas one subject (0.5%) complained of profound weakness.

## Discussion

The mean age of menarche of 13.08 years in this study is significantly lower than the figures reported in earlier studies conducted within Nigeria<sup>[2,12-15]</sup> and Ethiopia.<sup>[16]</sup> It is however comparable with the 13.02 years reported by Goon *et al.*<sup>[17]</sup> from Benue state, Nigeria, and 13.07 years reported by Ali *et al.* from Sudan<sup>[18]</sup>—two studies which were conducted less than a year before the present study. This lends credence to the presence of an overall trend of decline in the age at menarche as has been highlighted in several studies.<sup>[17,19-21]</sup> The existence of this trend in Ile-Ife is further supported

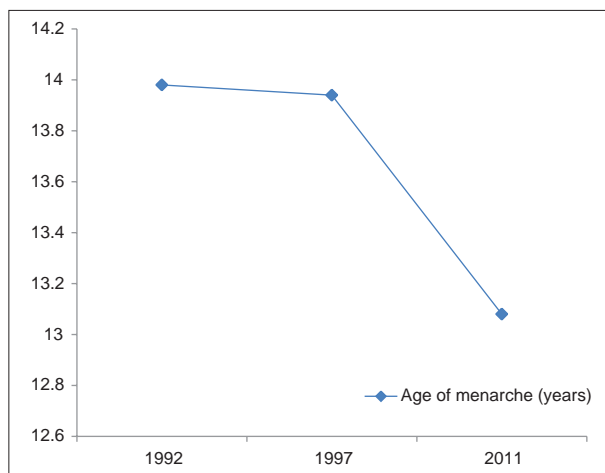


Figure 2: Trend of Age of Menarche in Ile-Ife, Nigeria

by the higher mean age reported by the previous studies conducted among secondary school girls in Ile-Ife in 1992 and 1997.<sup>[22,23]</sup> This observation has important implications on the reproductive health of these adolescents such as their age at coitache and first pregnancy.

The mean age at menarche obtained in our study is however still higher than the 12.81 and 12.22 years reported from

Table 1: Age of menarche among secondary school girls in Ile-Ife, Nigeria

Age (years)	Menarche attained n (%)*		Total n (%)**	Menarche attained Cumulative n (%)
	Yes	No		
9	0 (0.0)	1 (100)	1 (0.3)	0 (0.0)
10	0 (0.0)	7 (100)	7 (2.3)	0 (0.0)
11	1 (7.7)	12 (92.3)	13 (4.3)	1 (0.5)
12	9 (27.3)	24 (72.7)	33 (11.0)	10 (5.0)
13	32 (49.2)	33 (50.8)	65 (21.7)	42 (21.2)
14	55 (76.4)	17 (23.6)	72 (24.0)	97 (49.0)
15	56 (90.3)	6 (9.7)	62 (20.7)	153 (77.3)
16	32 (94.1)	2 (5.9)	34 (11.4)	185 (93.4)
17	13 (100)	0 (0.0)	13 (4.3)	198 (100.0)
Total	198 (66.0)	102 (34.0)	300 (100)	

\*Percentages are of the total in the rows. \*\*Percentages are of the total in the column

Table 2: Duration of menstrual flow among secondary school girls in Ile-Ife, Nigeria

Duration of flow (days)	Frequency (%)	Cumulative n (%)
2	1 (0.5)	1 (0.5)
3	49 (24.7)	50 (25.3)
4	50 (25.3)	100 (50.5)
5	93 (47.0)	193 (97.5)
6	5 (2.5)	198 (100)
Total	198 (100)	

Table 3: The menstrual cycle length of secondary school girls in Ile-Ife, Nigeria

Cycle length (days)	Frequency (%)	Cumulative n (%)
18	3 (1.5)	3 (1.5)
19	17 (8.6)	20 (10.1)
21	5 (2.5)	25 (12.6)
22	19 (9.6)	44 (22.2)
23	10 (5.1)	54 (27.3)
24	8 (4.0)	62 (31.3)
25	17 (8.6)	79 (39.9)
26	5 (2.5)	84 (42.4)
27	12 (6.1)	96 (48.5)
28	22 (11.1)	118 (59.6)
29	10 (5.1)	128 (64.6)
30	33 (16.7)	161 (81.3)
32	2 (1.0)	163 (82.3)
33	12 (6.1)	175 (88.4)
34	8 (4.0)	183 (92.4)
35	15 (7.6)	198 (100)
Total	198 (100)	

**Table 4: Prevalence of dysmenorrhoea among respondents**

Frequency of dysmenorrhoea	Frequency n = 198	Percentage	Cumulative Percentage
Every time	69	34.8	34.8
Occasionally	80	40.4	75.3
Never	49	24.7	100.0
Total	198	100.0	

Kaduna<sup>[24]</sup> and the Niger-Delta,<sup>[25]</sup> respectively. It is also higher than the reported age in United Kingdom where 11.8% of the girls had attained menarche before leaving primary school.<sup>[26]</sup> Although 90% of all girls in the United States<sup>[27]</sup> were reported to have started menstruating by age 13.75 years, only 77% of our postmenarcheal respondents had attained menarche at the age of 15 years. The earlier age of menarche in these other populations might be due to the effect of higher socioeconomic status and urbanization, both of which have been linked with earlier age of menarche. Ile-Ife is a semi-urban town and the schools sampled for our study were public secondary schools which are usually populated mostly by children from low and middle income families.

Majority (83%) of our respondents had cycle lengths ranging between 21 and 35 days. The 4.4% prevalence of primary amenorrhoea in the study population is comparable to the 2.6–4% reported in some earlier studies from Nigeria.<sup>[17,28]</sup> Although the 16.6% prevalence of polymenorrhoea (cycle length less than twenty-one days) found in our study appears to be much higher than that reported by Esimai<sup>[9]</sup> from the same environment, it is still less than the 24% reported by some other workers.<sup>[6,16]</sup> The much lower incidence reported by Esimai<sup>[9]</sup> may perhaps be due to the older population they sampled (mean age of 21.1 years) in whom the cycle is expected to have stabilized. The difference in the mean cycle length of this study (25.31 days) and that of Esimai<sup>[9]</sup> (29.9 days) may also be adduced to the same reason. The 11.1% prevalence of the 28-day cycle, based on which obstetric calculations are made, is similar to the 10.2% reported by an earlier study.<sup>[15]</sup>

Dysmenorrhoea, with a prevalence of 75.3%, was expectedly the commonest symptom associated with menstruation among the respondents. This is similar to the outcome of other studies from within and outside the country.<sup>[10,16,29]</sup> None of our respondents however reported dysmenorrhoea as a cause of school absenteeism. The 24.2% prevalence of loss of concentration in this study further emphasizes the need for counselling and psychological support during menstruation, especially in adolescents.

The age of menarche of secondary school girls in Ife Central Local Government is indeed reducing in tandem with global

trends. The high prevalence of dysmenorrhoea and loss of concentration associated with menstruation among the respondents may require intervention, in order to reduce the possible adverse effects on their school performance.

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### Conflicts of interest

There are no conflicts of interest.

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