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Original Research Article

Assessment of age at menarche and menstrual pattern among secondary school girls in Awka, Southeast Nigeria

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ABSTRACT

Background: Menarche is an important physiological milestone in girls and this usually occurs during their secondary school years. The menstrual pattern may vary in these adolescents. This knowledge may assist in counselling the young girls on reproductive health issues.

Methods: A cross-sectional study of female secondary school students from Kenneth Dike secondary school, Awka; Amaenyi girls' secondary school and community secondary school, Okpuno, all in Awka, Anambra state of Nigeria. All together 545 students were selected following informed consent. The study instrument was a pre-tested, semi-structured and self-administered questionnaire. Data analysis was done with IBM SPSS 20 software. Tests of association between variables were done with Fisher's exact test and the level of significance set at $p \leq 0.05$.

Results: The mean age of the 545 respondents was 16.79 ± 1.736 years and majority of them are of the Igbo ethnic group (90.5%). The average age at menarche was 12.77 ± 1.159 years. There is a significant difference between the age at menarche and the father's occupation. The modal duration of flow was 4 days (48.7%) while 95.2% had a normal cycle length of 21-35 days.

Conclusions: The average age of menarche of secondary school girls in Awka was 12.77 ± 1.159 years. Most of the students had normal menstrual flow duration of 2-7 days with a cycle length of 21-35 days.

Keywords: Age, Menarche, Menstrual pattern, School, Awka

INTRODUCTION

Menarche is an important milestone in the reproductive life of a woman. It is the onset of the very first menstruation of a young woman.¹ Menstruation is a normal physiological process that begins during adolescence and may be associated with various features occurring before or during the menstrual flow.¹ It is the culmination of a cascade of physiological events involving the pituitary gland, the ovaries and the uterus. Age at menarche is known to be influenced by many factors including genetics, nutrition, sporting activities, environment and economic status and may have geographical variation.²⁻⁴ Various studies have reported

varying ages at menarche in different populations. Ikaroha in Rivers state of Nigeria reported 13.19 ± 1.32 years for urban and 14.22 years for rural areas while a Kano study among secondary school students gave a mean age at menarche of 12.8 years.^{5,6} There was no statistically significant association between the age at menarche and the socioeconomic status of the parents in these studies.^{5,6} Another study at Abakaliki observed a mean age at menarche of 13 ± 1.0 years and with a high socioeconomic status of parents tending to reduce the age among the participants.⁷ Diorgu reported a mean menarcheal age of 12.8 ± 1.6 years in Portharcourt.⁸ Pandez in Mozambique reported 13.9 ± 1.29 years.⁹

However, menarcheal age of 13.66 years was reported in Morocco.¹⁰

Even though, biology of the human reproductive system is taught in Nigerian secondary schools, cultural and family inhibitions have restricted open discussion of menstrual issues especially with adolescents.⁶ However, adolescent girls and young women still discuss menstrual issues with their mothers and other close female associates.

In a Gambian study, two thirds of the surveyed girls reported having learnt about menstruation before menarche; however at menarche most felt unprepared.¹¹ Teachers were the main source of information, but when asking for advice most girls preferred to ask their mothers. Mothers reported facing difficulties in discussing menstruation with their children and felt that boys did not need to be taught about it. Most girls used reusable cloth unless they are given free menstrual pads from school.¹¹

In the adolescent, with onset of menstruation, the cycle and pattern of flow may take some period of time to stabilize. Some may have abnormally long or short cycles and volume of flow may vary as well.¹² A study in Northwest Nigeria showed that about one-quarter of the adolescent girls had a cycle length of 28 days. The average duration of flow was 4.9 ± 5.1 days with a normal amount of blood flow and regular menses in more than 80% of the adolescent school girls.¹³ In a similar study in Portharcourt, South Nigeria, the average duration of the menstrual cycle was 29.8 ± 3.3 days.⁸

Though studies have been done on various aspects of menarche and menstrual life of school girls in different parts of the world and the country, none has been documented in Awka, Southeast Nigeria which is the capital city of Anambra state and the seat of a teaching hospital and a medical college, Chukwuemeka Odumegwu Ojukwu university college of medicine and its affiliated teaching hospital. This study was aimed at finding the age at menarche and the menstrual pattern of secondary school girls at Awka, Southeast Nigeria. The results and findings will be a good tool in the hands of reproductive health practitioners in counselling and management of related conditions in these adolescents.

METHODS

Current study was conducted amongst girls drawn from post-primary schools in Awka, the capital city of Anambra state of Southeast Nigeria in May 2019. Many secondary schools in Awka are characterized by the absence of boarding facilities with the resultant high numbers of day students. Three post-primary schools were selected at random Kenneth Dike secondary school, Awka; Amaenyi girls' secondary school and community secondary school, Okpuno. Kenneth Dike secondary school and community secondary school, Okpuno are co-

educational institutions while the other is a female secondary school.

The survey employed a cross-sectional, descriptive study design. One class of a stream was selected at random starting from junior secondary school II (JSS II) to senior secondary school III (SSS III). The JSS I was excluded because it usually consists of very young children who are in their very first experience of post-primary education and are not yet in tune with secondary school life. Secondary school education in Nigeria is structured in a way that students spend a total of six years. The first three years are spent in the junior secondary segment while the last three are spent in the senior secondary segment. JSS II stream of a school may have up to three classes for instance, and only one class was selected. In the co-educational school, obviously only the female students in the selected classes were included in the study.

All together 545 students were drawn following informed consent. Their parents/guardians also gave their permission as well. The study instrument was a pre-tested, semi-structured and self-administered questionnaire which contained questions on socio-demographic characteristics including age, father's occupation and mother's level of educational attainment, religion and tribe. The father's occupation classification as a measure of socio-economic status was that developed by Oyedeji.¹⁴ Also contained in the questionnaire were height and weight (which were measured by the research assistant), age at menarche, duration of flow, presence of heavy flow, cycle length, dysmenorrhoea, etc. The weight and height were measured as the questionnaire was being administered. These were used to calculate their body mass index (BMI). Some of the selected students had not achieved menarche and therefore did not finish all the questions contained in the questionnaire. Data analysis was done with IBM SPSS 20 software. Tests of association between variables were done with Fisher's exact test and the level of significance set at $p \leq 0.05$.

RESULTS

The mean age of the 545 respondents was 16.79 ± 1.736 years and majority of them are of the Igbo ethnic group (90.5%). Most of them were in the 15-17 years age group. Seventy one percent of the respondents had normal body weight (BMI of 18.5-24.9 kg/m²) while only 1.3% of them were obese. The rest of the socio-demographic characteristics of the respondents are shown in (Table 1). The age at menarche of the respondents is shown in (Table 2). The average age at menarche was 12.77 ± 1.159 years. The modal age was 12 years.

Most of the respondents (83.9%) informed their mothers first about the onset of menarche even though a lesser number got pre-menarcheal education from them (67.2%) as shown in (Table 3).

There was a significant difference between the age at menarche and the father's occupation (Table 4). But there was no significant difference between the flow duration and the respondents' BMI, presence of dysmenorrhoea or the cycle length (Table 5).

The menstrual pattern is shown in (Table 6). The modal duration of flow was 4 days (48.7%) while 95.2% had a normal cycle length of 21-35 days.

Table 1: Socio-demographic characteristics of the respondents.

Variables (n=545)	N	(%)
Age (years)		
12-14	43	7.9
15-17	323	59.3
18-20	168	30.8
21-23	11	2.0
Mean±SD	16.79±1.736	
Minimum; maximum	12;22	
BMI		
Underweight	91	16.7
Normal weight	387	71.0
Overweight	60	11.0
Obese	7	1.3
Tribe		
Igbo	493	90.5
Hausa	5	0.9
Yoruba	10	1.8
Others	37	6.8
Religion		
Anglican	104	19.1
Roman Catholic	255	46.8
Pentecostal	183	33.6
Islam	3	0.6
Others	0	0
Father's occupation		
Professional	79	14.5
Administrative officer	60	11.0
Artisan	107	19.6
Business man	229	42.0
Farmer	70	12.8
Mother's educational status		
No formal education	18	3.3
Primary	76	13.9
Secondary	265	48.6
Tertiary	186	34.1
Resides with whom?		
Parents	313	57.4
Relatives	57	10.5
Guardian	163	29.9
Step mother	7	1.3
Others	5	0.9

Table 2: Age at menarche of respondents.

Variables	Frequency	(%)
Achieved menarche? (N=545)		
Yes	503	92.3
No	42	7.7
Age at menarche (years) (N=503)		
9	3	0.6
10	11	2.2
11	36	7.2
12	168	33.4
13	152	30.2
14	100	19.9
15	31	6.2
16	2	0.4

Table 3: Characteristics and events around menarche of the respondents.

Variables	Frequency	(%)
First person informed of menarche (N=503)		
Mother	422	83.9
Teacher	4	0.8
Girlfriend	22	4.4
Others	55	10.9
Educated on menses prior to menarche (N=503)		
Yes	469	93.2
No	34	6.8
Pre-menarche education given by (N=469)		
Mother	315	67.2
Sister	53	11.3
Teacher	71	15.1
Friend	12	2.6
Others	18	3.8
Received post-menarche education (N=501)		
Yes	457	91.2
No	44	8.8
Ever discussed menstruation with your mother (N=503)		
Yes	472	93.8
No	31	6.2

DISCUSSION

Current study showed an average age at menarche of 12.77±1.159 years and is similar to the findings of 13.19±1.32 years in a Portharcourt study and 12.8 years in other Portharcourt and Kano studies.^{5,6,8} It is also similar to the reports from other African countries of Mozambique and Morocco.^{9,10} There is also an agreement with the mean menarcheal age of 12.52 years found in an Indian study.¹⁵ The significant association between the father's occupation and the age at menarche is expected as this is a reflection of the socio-economic status which is known to have an inverse relationship with the age at menarche.

Table 4: Association between age at menarche and socio-demographic characteristics of the respondents.

Variables (n=503)	Age at menarche (years) N (%)								Test statistics F value	P value
	9	10	11	12	13	14	15	16		
BMI										
<18.5 (Underweight)	0 (0.0)	3 (4.1)	3 (4.1)	24 (32.9)	22 (30.1)	13 (17.8)	7 (9.6)	1 (1.4)	16.870	0.719
18.5-24.9 (Normal weight)	2 (0.5)	6 (1.6)	28 (7.7)	124 (34.1)	111 (30.5)	76 (20.9)	16 (4.4)	1 (0.3)		
25.0-29.9 (Overweight)	1 (1.7)	2 (3.4)	4 (6.8)	18 (30.5)	18 (30.5)	9 (15.3)	7 (11.9)	0 (0.00)		
≥30 (Obese)	0 (0.0)	0 (0.0)	1 (14.3)	2 (28.6)	1 (14.3)	2 (28.6)	1 (14.3)	0 (0.0)		
Tribe										
Igbo	3 (0.7)	10 (2.2)	34 (7.4)	157 (34.4)	133 (29.1)	90 (19.7)	28 (6.1)	2 (0.4)	17.009	0.711
Hausa	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (50.0)	2 (50.0)	0 (0.0)	0 (0.0)		
Yoruba	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	7 (77.8)	2 (22.2)	0 (0.0)	0 (0.0)		
Others	0 (0.0)	1 (3.0)	2 (6.1)	11 (33.3)	10 (30.0)	6 (18.2)	3 (9.1)	0 (0.0)		
Mother's educational status										
No formal education	0 (0.0)	0 (0.0)	1 (5.6)	7 (38.9)	6 (33.3)	3 (16.7)	1 (5.6)	0 (0.0)	10.306	0.975
Primary	0 (0.0)	2 (2.7)	6 (8.1)	19 (25.7)	26 (35.1)	15 (20.3)	5 (6.8)	1 (1.4)		
Secondary	3 (1.2)	5 (2.0)	15 (6.1)	88 (36.1)	69 (28.3)	49 (20.1)	14 (5.7)	1 (0.4)		
Tertiary	0 (0.0)	4 (2.4)	14 (8.4)	54 (32.3)	51 (30.5)	33 (19.8)	11 (6.6)	0 (0.0)		
Resides with										
Parents	2 (0.7)	6 (2.1)	22 (7.6)	103 (35.4)	84 (28.9)	55 (18.9)	19 (6.5)	0 (0.0)	26.608	0.540
Relatives	0 (0.0)	3 (5.8)	2 (3.8)	21 (40.4)	15 (28.8)	8 (15.4)	2 (3.8)	1 (1.9)		
Guardian	1 (0.7)	2 (1.3)	12 (7.9)	43 (28.5)	49 (32.5)	34 (22.5)	9 (6.0)	1 (0.7)		
Step-mother	0 (0.0)	0 (0.0)	0 (0.0)	1 (20.0)	1 (20.0)	3 (60.0)	0 (0.0)	0 (0.0)		
Others	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (75.0)	0 (0.0)	1 (25.0)	0 (0.0)		
Father's occupation										
Professional	0 (0.0)	4 (5.5)	9 (12.3)	23 (31.5)	21 (28.8)	15 (20.5)	1 (1.4)	0 (0.0)	46.797	0.014
Administrative officer	1 (1.8)	1 (1.8)	1 (1.8)	15 (27.3)	18 (32.7)	13 (23.6)	6 (10.9)	0 (0.0)		
Artisan	1 (1.1)	5 (5.4)	3 (3.2)	26 (28.0)	32 (34.4)	15 (16.1)	11 (11.8)	0 (0.0)		
Business man	1 (0.5)	1 (0.5)	16 (7.5)	83 (38.8)	63 (29.4)	43 (20.1)	6 (2.8)	1 (0.5)		
Farmer	0 (0.0)	0 (0.0)	7 (10.3)	21 (30.9)	18 (26.5)	14 (20.6)	7 (10.3)	1 (1.5)		

Table 5: Association between flow duration and some selected factors.

Variable (N=503)	Flow duration (days)		Test statistics F value	P value
	N (%)			
	1-7	≥8		
BMI				
<18.5 (Underweight)	72 (98.6)	1 (1.4)	1.146	0.766
18.5 – 24.9 (Normal weight)	362 (99.5)	2 (0.5)		
25.0 – 29.9 (Overweight)	59 (100.0)	0 (0.0)		
≥ 30 (Obese)	7 (100.0)	0 (0.0)		
Tires easily (anaemia)				
Yes	290 (99.7)	1 (0.3)	0.744	0.388
No	210 (99.1)	2 (0.9)		
Heavy flow				
Yes	229 (99.1)	2 (0.9)	0.523	0.470
No	271 (99.6)	1 (0.4)		
Menstruates monthly				
Yes	458 (99.6)	2 (0.4)	2.371	0.124
No	42 (97.7)	1 (2.3)		
Dysmenorrhoea				
Yes	372 (99.7)	1 (0.3)	2.624	0.105
No	128 (98.5)	2 (1.5)		

Table 6: Menstrual pattern of the respondents.

Variable (n=503)	Frequency	(%)
Menstrual flow duration (days)		
1	2	0.4
2	3	0.6
3	44	8.7
4	245	48.7
5	173	34.4
6	17	3.4
7	16	3.2
8	2	0.4
10	1	0.2
Tires easily after menstruation		
Yes	291	57.9
No	212	42.1
Heavy flow		
Yes	231	45.9
No	272	54.1
Menstrual cycle length (days)		
< 21	13	2.6
21-35	479	95.2
> 35	11	2.2
Dysmenorrhoea		
Yes	373	74.2
No	130	25.8
Missed school due to menses		
Yes	122	24.3
No	381	75.7
Reason for missing school (N=121)		
Pain	100	82.6
Heavy flow	16	13.2
Felt dizzy	5	4.1

In other words, girls from a high socio-economic class tend to achieve menarche at a younger age. Most of the respondents informed their mothers first at the achievement of menarche and it was their mothers also that educated majority of them on menarche and menstruation. This is in keeping with the family life as girls are known to have close relationship with their mothers especially on feminine matters. Such were also the findings in other studies.^{5,7,8}

The modal menstrual flow duration in this study of 4 days is within the normal physiology. Only 0.6% of the students had abnormal flow duration of more than 7 days. In fact, 99.0% of them had normal duration of flow. However, 24.4% of the students missed school attendance on account of menstruation as was the case in other studies in India and Ghana and majority of them did so because of dysmenorrhoea.^{16,17} This will likely affect their academic performance in the long run.

It is surprising that there is no significant association between the duration of flow and development of tiredness (which suggests anaemia) as one would expect. However, long flow duration may not necessarily be accompanied by heavy loss which is what will lead to anaemia. Flow duration is not also related to the respondents' BMI, presence of dysmenorrhoea or cycle regularity.

CONCLUSION

The average age of menarche of secondary school girls in Awka was 12.77±1.159 years. Most of the students had normal menstrual flow duration of 2-7 days with a cycle

length of 21-35 days. Only a small minority had a heavy flow.

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