

## Research Article

## Age at Menarche and Menstrual Patterns among Adolescent Girls in Port Harcourt

Faith C. Diorgu. PhD, RM.<sup>1</sup> and Kelechim N Diorgu. MD.<sup>2</sup><sup>1</sup>Nurse/Midwife lecturer Department of Nursing Science University of Port Harcourt Nigeria.<sup>2</sup>Oncology clinical research associate Sarah Cannon research institute Nashville TN 37203.\*Corresponding Author  
Faith C Diorgu. PhD, RM.

**Abstract: Background:** Menstrual cycle often have variable patterns and characteristic within the year of menarche, which may pose challenge to many adolescent girls. Providing correct information on menstruation is necessary to reduce anxiety, menstrual morbidity and improve reproductive health of these adolescents population. The purpose of this study was to determine the age at menarche and patterns of menstruation among school adolescent girls and explore its variation across socio-economic and demographic factors. **Material Method:** This is a cross-sectional descriptive study carried out on 848 school adolescent girls in Port Harcourt city of Nigeria. Data were collected using a self-administered structured questionnaire on menstruation. Data was entered and analyzed by using SPSS software package. **Results:** The age of the school girls in the study was between 10 – 19 years with mean of  $16 \pm 0.93$  years. The mean age at menarche was  $12.5 \pm$  and modal age at menarche was 13 years. Ninety three (93%) of the girls had their menarche before 12 years and 5 out of every 6 girls had their menarche before 14 years. About 364 (56.1%) of the girls had regular menstruation from the beginning and 434 (67%) had regular menses established within 6 months of menarche, while 214 (33%) had irregular menses for over 6 months after menarche. Seventy one percent (71%) had menses lasting 3 to 5 days and 27.5% have menses lasting more than 5 days. The mean duration of menstrual flow was 4 days with a mode of 5 days. **Conclusion:** The age at menarche and other menstrual patterns observed in this study are similar to adolescent menstrual characteristics described by studies.

**Keywords:** Menarche, Menstruation, Adolescents.

### INTRODUCTION

Menarche is the first menstruation and it is one of the most recognized signs of puberty. It often occurs between ages 8 to 18 years in girl adolescents (Kaplowitz, P. 2006). By the age of 8 to 9 years, follicle stimulating hormones (FSH) and luteinizing hormone (LH) under the influence of anterior pituitary gland begin to secrete gonadotropins releasing hormone from the hypothalamus (Bates, G.W. 1997). Due to the activation of the ovaries by the gonadotropins, oestrogen is being produced (Bates, G.W. 1997; Sperroff, L. *et al.*, 1999). Adequate production of oestrogen causes proliferation of the endometrium which leads to the first menstruation referred to as "Menarche" (Sperroff, L. *et al.*, 1999). The presence of oestrogen and progesterone hormones, on the endometrium leads to thick layers that is shed in a cyclical manner each month (Sperroff, L. *et al.*, 1999; Cameron, I.T. *et al.*, 1996). The duration of normal

menstrual flow is about 2 to 7 days with 30 -80mls blood loss from the endometrium (Mishell, D.R. 2001). Following the menarche, menses may become regular and ovulatory for a period of 1 -2 years, with a mean cycle length of 1 -2 years, with a mean cycle length of  $20 \pm 7$  days, until perimenopausal years, when the ovarian function is expected to decline (Mishell, D.R. 2001; Diaz, A. *et al.*, 2006). Although, menstruation is a part of maturation process, variability in the pattern and characteristics exist and menstrual disorder becomes unusual. The purpose of this study was to determine the age at menarche and patterns of menstruation among adolescent girls in Port Harcourt, Nigeria.

### MATERIAL AND METHODS

The study is a cross-sectional descriptive study of menstrual pattern and age at menarche of 648 adolescent girls in four selected Secondary Schools (High school) in Nigeria. The schools are two

Quick Response Code



Journal homepage:

<http://www.easpublisher.com/easjnm/>

Article History

Received: 13.03.2019

Accepted: 30.03.2019

Published: 28.04.2019

**Copyright © 2019 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

DOI: 10.36349/easjnm.2019.v01i02.004

government and two private mixed secondary schools located in Port Harcourt city of Nigeria. The schools are regarded as among the top secondary schools in Port Harcourt city of Nigeria. They were purposively chosen because, female students dominates in these schools and the female students comprised of girls in their early, middle and late adolescents from different ethnic and socio- economic family classes who are resident in Port Harcourt city and its suburbs.

The girls were selected according to WHO definition of adolescence, which is between 10 to 19 years (World Health Organisation Task Force on Adolescent Reproductive Health. 1986). Pre-tested questionnaire was used for data collection. The questionnaire was properly explained to students to facilitate correct response from students. The questionnaire was distributed and collected immediately on the spot to avoid peers influence on individual responses. Informed consent was obtained from the adolescent girls and the head of the school. Due approval was obtained from the institutional Ethic committee. Six hundred and ninety eight (698) questionnaire was distributed, 658 were filled correctly, of this, 10 (1.4%) girls did not yet experience their first menstruation, thus were not included in the study. So, we had 648 as the total number of questionnaire from the 4 selected schools. This study therefore, is based on 648 questionnaire. The questionnaire had questions on age, date of birth, age at menarche, regularity of menstruation, length of cycle, duration of menses and pre- menstrual symptoms and dysmenorrhea. The data gathered were coded, entered and analyzed using Statistical Package for Social Science (SPSS) version 10.0 for window.

**RESULTS**

Out of 698 questionnaire administered, 658 (94%) were filled correctly, 10 (1.4%) had not had menarche and were excluded. Only 648 (92%) of the questionnaire was used for the study. The age of the school girls in the study was between 10 – 19 years with mean of 16 0.93 ± years. Table 1. Shows frequency distribution of ages of the respondents.

**Table1. Age distribution of respondents**

Age	Frequency	Percentage
10 - 12	108	16%
13 - 15	354	55%
16 - 19	186	29%
<b>Total</b>	<b>648</b>	<b>100</b>

The mean age at menarche was 12.5 and ± modal age at menarche was 13 years. Ninety three (93%) of the girls had their menarche before 12 years and 5 out of every 6 girls had their menarche before 14 years. Table 2. Shows the frequency distribution of the age at menarche of 648 respondents.

**Table2. Age at menarche distribution of the respondents**

Age at menarche	Frequency	Percentage
9	21	3.2%
10	42	6.4%
11	119	18.3%
12	142	21.9%
13	174	26.8%
14	77	11.8%
15	56	8.6%
16	20	3%
<b>Total</b>	<b>648</b>	<b>100%</b>

The shortest menstrual cycle was 21 days and the longest was 32 days among the 648 respondents. Their mean length of the menstrual cycle was 27.9 with the median being 28 days. Seventy four (11.4%) of the girls did not know the length of their menstrual cycle. Table 3 shows the frequency distribution of the duration of menstrual cycle in 576 (88.6%) respondents. About 364 (56.1%) of the girls had regular menstruation from the beginning and 434 (67%) had regular menses established within 6 months of menarche, while 214 (33%) had irregular menses for over 6 months after menarche. Few of the respondent, 12 (1.8%) reported experience of bleeding with clots.

**Table3. Duration of menstrual cycle distribution of the respondents**

Cycle length in days	Frequency	Percentage
21 - 23	76	11.7%
24 - 26	94	14.5%
27 - 29	363	56%
30 -32	115	17.7%

Seventy one percent (71%) had menses lasting 3 to 5 days and 27.5% have menses lasting more than 5 days. The mean duration of menstrual flow was 4 days with a mode of 5 days. Table 4 shows the duration of menstruation of the respondents.

**Table4. Duration of menstruation distribution of the respondents**

Duration of menses in days	Frequency	Percentage
Less than 2	0	0%
2	8	1.2%
3	132	20.3%
4	218	33.6%
5	111	17.1%
6	103	15.8%
7	76	11.7%

The prevalence of dysmenorrhea was 62% among the girls in the study. About 48% of the girls with dysmenorrhea have their symptoms repeated in most of the menstrual cycles.

## DISCUSSION

The mean age at menarche in this study was 12.4; this is 1.5 years earlier than the mean age at menarche of  $13.4 \pm$  year as noted  $\pm$  in a study at Obafemi Owolowo University Ile-effe (Adadevoh, S.W. *et al.*, 1989; Mishell, D.R. 2001). However, the age at menarche in this study agrees with 12.7 years as reported in girls at school in Yaounde (Adadevoh, S.W. *et al.*, 1989). Other studies have noted new trend on earlier age at menarche in other parts of Africa (Adadevoh, S.W. *et al.*, 1989; Thomas, K. D. *et al.*, 1990; Pasquet, P. *et al.*, 1999). Even in the North America with mean age at menarche among Black American girls ranging from 12.06 to 12.16 years (Sperroff, L. *et al.*, 1999; Adadevoh, S.W. *et al.*, 1989). Some studies have associated earlier menarche to socio-economic class, linking upper class with menarche at an early age (Chumlea, W. C. *et al.*, 2013; Adanu, R. M. *et al.*, 2006; Ekele, B. A. *et al.*, 1996). Early menarche exposes girls to risky sexual activity and vulnerable to sexually transmitted infections, unwanted pregnancies, unsafe abortion and adolescence motherhood. All of these may contribute to poor reproductive health of this young population. There is therefore, the need for sexual and reproductive health education for the pre-adolescents and adolescents age group to help protect them from risky and early sexual exposures.

In the current study, the length of menstrual cycle of 21 – 32 days and the mean length of 27.9 days and the median being 28 days is similar to studies in the literature (Abioye-Kuteyi, E. A. *et al.*, 1997).

From menarche to within a year, menstrual cycles may be irregular in nature and this may explain why 33% of the girls experienced irregular menstrual cycles. The menstrual cycle within the first year after menarche may be irregular and prolonged with menstrual blood clots. The irregularity is due to poor or defective development of the follicles resulting in unovulatory cycle (Sperroff, L. *et al.*, 1999; Fakeye, O., & Adegoke, A. 1994). The mean duration for menstrual flow in this study is similar to mean duration of menstrual flow noted in other studies. The mean duration of 4.5 and 4.0 days were found in Nigeria and Ethiopia respectively (Mishell, D.R. 2001; Sule, S.T., & Ukwanya, J.E. 2007).

The presence of dysmenorrhea was 62% among the girls in the study about 72% from Nigeria and Ethiopia (Ersoy, B. *et al.*, 2014; Apter, D. *et al.*, 1987). Accurate education of the adolescent girls on menstruation is vital, because when girls start menstruating without adequate knowledge and information, they may suffer unnecessary morbidity related to menstrual cycle, such as irregular menstruation, dysmenorrhea, heavy menstrual flow and unwanted pregnancies and sexually transmitted infections. All of these, can be prevented and adolescent girl protected against them.

## CONCLUSION

In conclusion, the age at menarche and other menstruation patterns and characteristics are similar to those described in some studies in other populations. The menstrual disorder among the adolescents were common. A school health education program on menstruation for female adolescent can be helpful.

## Acknowledgement

We are grateful to all the students who participated in study and the school staff who showed good cooperation. We also thank Dr E. Oranu and Dr C. Tobi-West of University of Port Harcourt Teaching Hospital, Nigeria for their contributions and support.

## REFERENCES

1. Kaplowitz, P. (2006). Pubertal development in girls: secular trends. *Current opinion in obstetrics and gynecology*, 18(5), 487-491.
2. Bates, G.W. (1997). Normal and abnormal puberty. In: Carr BR, Blackwell RE, editors. Textbook of reproductive medicine. Norwalk: Appleton and Lange, 49-65.
3. Sperroff, L., Glass, R.H., & Kase, N.G. (1999). Regulation of the menstrual cycle. In: Clinical gynaecologic endocrinology and infertility. Philadelphia: Lippincott Williams and Wilkins, 201-246.
4. Cameron, I.T., Irvine, G., & Norman, J.E. (1996). Menstruation. In: Hillier SG, Kitchener HC, Neilson JP, editors. Scientific essentials of reproductive medicine. London, 208-18.
5. Mishell, D.R. (2001). Abnormal uterine bleeding. In: Stenchever MA, Droegenmueller W, Herbst AL, Mishell DR, editors. Comprehensive gynecology. St. Louis: Mosby, 1079-1099.
6. Diaz, A., Laufer, M.R., & Breech, L.L. (2006). Menstruation in girls and adolescents: using the menstrual cycle as a vital sign. *Pediatrics*, 118(5), 2245-2250.
7. World Health Organisation Task Force on Adolescent Reproductive Health. (1986). World Health Organization multicenter study on menstrual and ovulatory patterns in adolescent girls. II. Longitudinal study of menstrual patterns in the early postmenarcheal period, duration of bleeding episodes and menstrual cycles. *J Adolesc Health*, 7, 236-44.
8. Adadevoh, S.W., Agble, T.K., Hobbs, C., & Elkins, T.E. (1989). Menarcheal age in Ghanaian school girls. *Int J Gynaecol Obstet*, 30(1), 63-8.
9. Mishell, D.R. (2001). Reproductive endocrinology. In: Stenchever MA, Droegenmueller W, Herbst AL, Mishell DR, editors. Comprehensive gynecology. St. Louis: Mosby, 71-126.
10. Thomas, K. D., Okonofua, F. E., & Chiboka, O. (1990). A study of the menstrual patterns of adolescents in Ile-Ife, Nigeria. *International Journal of Gynecology & Obstetrics*, 33(1), 31-34.

11. Pasquet, P., Manguelle-Dicoum Biyong, A., Rikong-Adie, H., Befidi-Mengue, R., Garba, M. T., & Froment, A. (1999). Age at menarche and urbanization in Cameroon: current status and secular trends. *Annals of human biology*, 26(1), 89-97.
12. Chumlea, W. C., Schubert, C. M., Roche, A. F., Kulin, H. E., Lee, P. A., Himes, J. H., & Sun, S. S. (2003). Age at menarche and racial comparisons in US girls. *PEDIATRICS-SPRINGFIELD-*, 111(1), 110-113.
13. Adanu, R. M., Hill, A. G., Seffah, J. D., Darko, R., Anarfi, J. K., & Duda, R. B. (2006). Secular trends in menarcheal age among Ghanaian women in Accra. *Journal of obstetrics and gynaecology*, 26(6), 550-554.
14. Ekele, B. A., Udoeyop, E. U., & Otubu, J. A. (1996). Age at menarche amongst school girls in a high altitude Nigerian town. *West African journal of medicine*, 15(3), 170-172.
15. Abioye-Kuteyi, E. A., Ojofeitimi, E. O., Aina, O. I., Kio, F., Aluko, Y., & Mosuro, O. (1997). The influence of socioeconomic and nutritional status on menarche in Nigerian school girls. *Nutrition and Health*, 11(3), 185-195.
16. Ersoy, B., Balkan, C., Gunay, T., Onag, A., & Egemen, A. (2004). Effects of different socioeconomic conditions on menarche in Turkish female students. *Early Human Development*, 76(2), 115-125.
17. Fakeye, O., & Adegoke, A. (1994). The characteristics of menstrual cycle in Nigerian school girls and the implications for school health programmes. *Afr J Med Sci*, 23, 13-7
18. Sule, S.T., & Ukwenya, J.E. (2007). Menstrual experiences of adolescents in a secondary school. *Turkish-German Gynecol Assoc*, 8(1), 7-14.
19. Apter, D., Räisänen, I., Ylöstalo, P., & Vihko, R. (1987). Follicular growth in relation to serum hormonal patterns in adolescent compared with adult menstrual cycles. *Fertility and sterility*, 47(1), 82-88.
20. Zegeye, D.T., & Megabiaw, B. (2011). Mulu A. Age at menarche and the menstrual pattern of secondary school adolescents in northwest Ethiopia. <http://www.biomedcentral.com> Accessed in March, 2011.
21. Odujinrin, O. M., & Ekunwe, E. O. (1991). Epidemiologic survey of menstrual patterns amongst adolescents in Nigeria. *West African journal of medicine*, 10(3-4), 244-249.