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Original Research Article

Understanding the knowledge and experience of menarche among secondary school female students in Nnewi, Anambra State, Nigeria

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ABSTRACT

Background: Menstruation, a key physiological change in females of reproductive age, necessitates providing young girls with crucial information on menarche to better prepare them.
Methods: This study assessed the knowledge and experience of menarche among secondary school female students in Nnewi, Anambra State, Nigeria, utilizing a descriptive cross-sectional survey method. Conducted from August to September 2023, the study involved 420 participants and employed multistage sampling for selection.
Results: The findings revealed a paradoxical decrease in the mean age of menarche to 12.02 +/- 1.15 years, with most girls experiencing menarche at age 13. Notably, 91.4% of participants had substantial knowledge of menarche, primarily acquired from mothers. Although 86.9% recognized menarche as a normal puberty change, experiences varied: 45.5% felt normal, 39.3% were afraid, and 12.9% felt ashamed during their menarche.
Conclusions: The study concludes that despite high awareness levels, poor menarche experiences prevail due to inadequate preparation. It recommends enhanced awareness campaigns in schools, spearheaded by NGOs and health workers, to educate and prepare young girls for menarche effectively.

Keywords: Experience, Female students, Knowledge, Menarche, Secondary school

INTRODUCTION

Menstruation is monthly vaginal bleeding in females of reproductive age due to the shedding of the endometrial wall of the uterus.[1] It is often referred to as 'period' or 'menses' associated with the sexual health of every female of reproductive age. It is the cyclical (monthly) shedding of the inner wall of the uterus influenced by the hormonal effect involving both the hypothalamus and pituitary axis.

Menarche, or the initiation of menstruation, is an important event in a female of reproductive age and marks reproductive maturity.[1,2] It is the first manifestation of the menstrual cycle, or the beginning of menstrual bleeding seen in female genders.

The age of adolescence is the period between 10 and 19 years of age.[3] For years now, there has been a decline in the age of menarche, a growth spurt, and an increase in

the height growth velocity.[3,4] Though the age of menarche has declined in developed countries and the reason for this change remains unknown, however, it is assumed to be due to improvement in health, genetic control, environmental, socioeconomic conditions, general health and well-being, nutritional status, certain types of exercise, seasonality and family size possibly play a role.[5]

Menarche is one of the most important changes which manifests in girls at puberty stage.[6] Consequently, adequate menstrual knowledge is required to enable them to become confident and effective in menarche when it comes. Adequate menstrual knowledge is obtained through proper menstrual education. Thus, menstrual education is an essential aspect of health education, and the knowledge acquired may affect a girl's attitude to menstruation and menstrual practice, both at menarche and beyond.[7] Information about menarche is obtained first from either the mother or other female family members who, sometimes, may lack the necessary information, especially in low and middle-income countries.[8]

The experience females have during menarche varies, ranging from anxiety, fear, confusion, and even depression.[1,2] They experience physical, psychological, social, emotional, and mental changes.[9] It is also pertinent to observe that the normal menstrual cycle in females ranges from 21 to 35 days, and the menstrual flow ranges from 2 to 7 days. The menstrual blood volume lost is approximately 30ml to 80ml with an irregular period at extreme reproductive life which, may be due to inadequate follicular development and anovulation.[8]

The age for menarche varies, but still falls under the adolescent period, which ranges from 10 and 19 years, it is very remarkable with physical, psychological, social, emotional, and mental changes. These loads of changes, which include menarche, most often than not, result in severe physical and emotional damage when proper care and guidance are ignored. This explains the frequent anxiety, fear, confusion, and even depression most females experience during menarche. Hence, it is necessary to educate young girls on how best to improve their safety and skills to enable them to become confident and effective in managing their menarche when it begins. However, menstrual education has been impeded greatly by the parents' and teachers' inability to properly equip young girls with the needed knowledge. This inability stems from factors such as religious and cultural background, where talking about the reproductive aspects of the body is taboo or forbidden, thus leading to the parents/teachers being unable to teach young girls what they need to know and expect; also, the busy schedule of the parents leads to their inability to pay attention to the needs of their young girls.

The objective of the study was to assess the knowledge and experience of menarche among secondary school female students in Nnewi.

METHODS

Study area

The study was carried out in Secondary Schools at Nnewi in Nnewi North Local Government Area (L.G.A), Anambra state.

Study design

The study was a student-based cross-sectional survey which was conducted among Secondary School Female Students in Nnewi between August 2023 to September 2023. A descriptive cross-sectional study using a pretested, semi structured, and self-administered questionnaire designed was adopted for the study.

Study population

The cross-sectional multi-center study was conducted on a large sample of Secondary School Female Students in Nnewi. Attending schools were randomly selected from different towns in Nnewi (Otolo, Uruagu, Umudim, and Nnewichi).

The girls were contacted at school, and those who had had menarche were recruited. All participants were informed about the nature, purpose, and procedures of the study, and informed written consent was obtained from the students and their legal guardians. The procedures followed were in line with the ethical standards of the local institutional responsible committee on human experimentation. Girls were asked to fill out a self-administered anonymous questionnaire.

Inclusion criteria

All selected Secondary School Female Students at Nnewi in Nnewi North L.G.A were included.

Exclusion criteria

Students who declined to participate in the research survey, students that have not attained menarche and students who are absent from school on the day of the research were excluded.

Sample size determination

$N = z^2pq/d^2$

Where; N = the desired sample size (if target population is more than 10,000), z = the standard normal deviation at the required confidence level of 1.96, d = the level of statistical significance set (Precision value = 0.05), q = 1-p, p= 0.40, q = 0.6.

$N= (1.96)^2 \times 0.4 \times 0.6 / (0.05)^2 = 368.7936 \approx 369$

An attrition rate of 10% was added to the sample size hence the final sample size was 368.7 + 36.87 = 405.57 approximately 406 and was increased to 420, which formed the final sample size.

Sampling technique

A Multistage sampling was used to select the required number of students. At the first stage, Nnewi North L.G.A. was divided into 4 communities: Otolo, Uruagu, Umudim, and Nnewichi, and one school was selected from each community by simple random sampling. Furthermore, three classes (SS1, JSS 3, JSS 2) were selected out of six classes in each of the schools using a simple random sampling. 35 students each were selected from the 3 classes making a total number of 105 students from each school, and a total number of 420 students. All the students within the selected schools who gave their consent were educated on the questionnaire and then used for the study.

Study instrument

The study instrument comprised of interviewer administered questionnaire. The questionnaire was divided into 4 sections (1, 2, 3, and 4). Section 1 was personal data, section 2 was onset of menarche, section 3 was prior knowledge of students toward menarche and section 4 was experience with menarche.

Validation of the questionnaire

The validation of the questionnaire used in this study on the knowledge and experience of menarche among secondary school girls in Nnewi, Nigeria, involved a pretested, semi-structured, self-administered format.

Data collection tools

Data were collected through an interview administered, anonymous, and validated questionnaire by the researcher and research assistants. Research assistants were medical students from College of Health Sciences, Nnamdi Azikiwe University, Nnewi who participated in a training, prior to data collection to minimize bias. The questionnaire was developed with guidance from several works already done on the subject related or similar works and reviewed by the project supervisor before data collection. Informed consent was obtained before administering the questionnaire.

Procedure of data collection

The questionnaire was administered to the students to fill (self-administered) on the spot, and it was collected from them immediately without allowing them to go home with it to avoid bias and loss of questionnaires. The questionnaire was checked for completeness in filling before collection.

Data management/analysis

The data were cleaned, coded, and analyzed using appropriate statistical format and statistical package for social sciences (SPSS) version 25.0. Categorical variables were analyzed using percentages and proportions, and continuous variables were analyzed using mean and standard deviation. The association between categorical variables were analyzed using the Chi-square test (or Fischer's exact, when appropriate). The significance of p value ≤0.05 was statistically significant. The variables were presented using appropriate tables or charts.

Ethical approval was obtained from the Nnamdi Azikiwe University Teaching Hospital Ethical Committee (NAUTHEC), following which the study was conducted under the professional scrutiny of a Public Health consultant. Informed consent was obtained from the head of the school and participant before administering the questionnaire. Data collections were anonymous.

RESULTS

A study was carried out to assess the "Knowledge and experience of menarche among secondary school students in Nnewi, Anambra State. 420 secondary school students from Nnewi were sampled and the results obtained are presented in the Table 1.

From Table 1 most of the respondents fall within 13years of age, 157 (37.4); 14years, 108 (25.7%); 12 years, 86 (20.5%); with the mean age of 13.4±1.16 years.

All the respondents were females, 420 (100%); single, 420 (100%) and Christians, 420 (100%); however, a greater proportion were from the Roman Catholic denomination. The study population was predominantly Igbos, 417 (99.3%). 278 (65.7%) were in JSS1; 82 (19.5%) in JSS2 and 62 (14.8%) in SS1. On mother's educational status, the majority fell into tertiary level of education 232 (55.2%), followed by secondary, 146 (34.8%) and primary 42 (10%). As regards mothers' occupation great majority were traders, 303(72.1%); civil servant, 68 (16.2%); and teachers 35, (8.3%).

From Table 2, majority of the respondents have had their first menstrual period, 417 (99.3%), with a greater proportion having their first menstruation around 11-13 years with a prevalence of, 150 (35.7%) for 13years, 121 (28.8%) for 12 years, and 90 (21.4%) for 11 years. About half of the respondents do not know the number of days their menstrual cycle lasted at menarche, 212 (50.5%), however, 123 (29.2%) claimed theirs lasted between 21-35days, 72 (17.1%) lasted less than 21days while 13 (3.1%) of them claimed theirs lasted for more than 35days. Regarding number of days of menstrual flow, majority 334 (79.5%), had theirs for about 2-7days, however 52 (12.4%) don't know how long their menstrual flow lasted.

Table 1: The respondents' socio-demographic characteristics.

Variable	Frequency	Percentage
Age (years)		
11	6	1.4
12	86	20.5
13	157	37.4
14	108	25.7
15	49	11.7
16	6	1.4
17	5	1.2
18	3	0.7
Mean age (years)	13.38±1.16	
Gender		
Female	420	100.0
Marital status		
Single	420	100.0
Religion		
Christianity	420	100.0
Denomination if a Christian		
Roman Catholic	255	60.7
Anglican	105	25.0
Pentecostal	60	14.3
Tribe		
Igbo	417	99.3
Yoruba	3	.7
Class		
JSS 2	82	19.5
JSS 3	276	65.7
SS 1	62	14.8
Mother's educational status		
Primary	42	10.0
Secondary	146	34.8
Tertiary	232	55.2
Mother occupation		
Business/trader	303	72.1
Civil servant	68	16.2
Farmer	8	1.9
Housewife	6	1.4
Teacher	35	8.3

From Table 3, majority, 365 (86.9%) of the respondents understand menarche to be a normal physiological change that happens at puberty, 24 (5.7%) believe it's a pathological change that occur due to uterine changes, and 15 (3.6%) believe it's a curse from God to women of childbearing, however 16 (3.8%) don't know the meaning of menarche. 337 (80.2%) attested to uterus to being the source of menstrual flow, however, 63 (15%) don't know the source of menstrual blood. The majority of 384 (91.4%) knew about menarche before it started, and among the respondent that alluded to knowing about menarche before it started, their mother was their first source of information about menarche (68.8%), followed by teachers, 51 (12.1%). Other sources of information about menarche were from peer groups (69.8%); social media (16.2%); church (4.5%); father (3.6%); and sister (2.1%). The majority (71.7%) of the respondents had an initial perception of menarche as being normal physiology, however, 7.6% thought that it was a sign of life-threatening disease. About 81.7% of the respondents agreed that the symptoms would not continue forever, 5.7% agreed that it would, however 7.1% did not know if it will continue forever.

Concerning their overall level of knowledge of menarche, 406 (96.7%) had good knowledge while 14 (3.3%) had poor knowledge, however their average knowledge score was 83.5±17.49%.

Table 2: The respondents' onset of menarche.

Variable	Frequency	Percentage
Have you had your first menstrual period yet?		
Yes	417	99.3
No	3	.7
At what age did you have your first menstrual period?		
8	3	0.7
9	3	0.7
10	29	6.9
11	90	21.4
12	150	35.7
13	121	28.8
14	16	3.8
15	6	1.4
16	2	0.5
What was the number of days of your menstrual cycle duration at menarche?		
Less than 21 days	72	17.1
21-35 days	123	29.3
More than 35 days	13	3.1
Don't know	212	50.5
What was the number of days of menstrual flow?		
Less than 2 days	15	3.6
2-7 days	334	79.5
> 7 days	19	4.5
Don't know	52	12.4

From Table 4, a great proportion of the respondents, 191 (45.5%) felt normal at their first menstruation, however, a great percentage of them were afraid at their first menstruation. The majority attested to having pain during menstruation, 175 (41.7%), however, about 22.9% claimed to never had pain during menstruation.

As regards to if they were prepared for menarche, there was an equal distribution among the respondents between those who were prepared and those who were not, with a prevalence of 210 (50.0%) respectively.

The common symptoms experienced by the respondents prior to menarche were abdominal pain 280 (66.7%), weakness 251 (59.8%), and mood swing, 187 (44.5%).

However, the common symptoms experienced during menstruation were irritation, 255 (60.7%) and heavy flow, 210 (50.0%).

As regards the relationship between age and their knowledge of menarche, the older respondents had better knowledge, however this was not statistically significant (p>0.05). As regards the relationship between class and their level of knowledge of menarche, respondents from SS1 class had better knowledge than their counterpart in JSS 2 and 3, and this was statistically significant (p≤0.05). With respect to the relationship between mother's educational status and level of knowledge of menarche, those whose mother completed tertiary education had better knowledge and this was statistically significant (p≤0.05).

Table 3: The respondents' knowledge of menarche.

Variable	Frequency	Percentage
What do you understand as menarche?		
A normal physiological change that happens at puberty	365	86.9
A pathologic change that occurs due to uterine changes	24	5.7
A curse from God to women of childbearing age	15	3.6
Don't know	16	3.8
What is the source of menstrual blood?		
Uterus	337	80.2
Stomach	20	4.8
Don't know	63	15.0
Did you know about menarche before it started?		
Yes	384	91.4
No	36	8.6
If Yes, what was your first source of information about menarche?		
Mother	288	68.6
Sister	27	6.4
Friends	18	4.3
Teacher	51	12.1
No response	36	8.6
What were other sources of information about menarche?		
Father	15	3.6
Church	19	4.5
Peer groups	293	69.8
Social media	68	16.2
Teacher	13	3.1
Sister	9	2.1
No response	3	0.7
What was your initial perception of menarche at the onset of menstruation?		
Normal physiology	301	71.7
Symptoms of illness	87	20.7
Sign of life-threatening disease	32	7.6
Will the period continue forever?		
Yes	24	5.7
No	366	87.1
Don't know	30	7.1
Level of knowledge of menarche		
Poor knowledge (< 50)	14	3.3
Good knowledge (≥50)	406	96.7
Average knowledge score	83.48±17.49	

Table 4: The respondents' experience of menarche.

Variable	Frequency	Percentage
What was your feeling at the first menstruation?		
Normal	191	45.5

Continued.

Variable	Frequency	Percentage
Shame	54	12.9
Fear	165	39.3
Guilt	10	2.4
Do you have pain during menstruation?		
Mostly	175	41.7
Rarely	149	35.5
Never	96	22.9
Were you prepared for menarche?		
Yes	210	50.0
No	210	50.0
Symptoms experienced prior to menarche		
Felt feverish	98	23.3
Felt weak	251	59.8
Abdominal pain	280	66.7
Headache	151	36.0
Vomiting	26	6.2
Mood swing	187	44.5
Symptoms experienced during menarche?		
Heavy flow	210	50.0
Irregular menstrual flow for 3 months	166	39.5
Irritating	255	60.7
Shameful and embarrassed due to unprepared	171	40.7
Hiding from friends	195	46.4
Prevented you from going to school	17	4.0

Table 5: The relationship between some of the respondents' socio-demographics and their knowledge of menarche.

		Respondents' knowledge of menarche					
		Poor knowledge (%)	**Good knowledge (%)**	**Total**	**Chi-square (x^2)**	**df**	**p-value (≤0.05)**
Age (Years)	11	0 (0.0)	6 (100.0)	6	3.30	7	0.86
	12	2 (2.3)	84 (97.7)	86			
	13	8 (5.1)	149 (94.9)	157			
	14	2 (1.9)	106 (98.1)	108			
	15	2 (4.1)	47 (95.9)	49			
	16	0 (0.0)	6 (100.0)	6			
	17	0 (0.0)	5 (100.0)	5			
	18	0 (0.0)	3 (100.0)	3			
	Total	14	406	420			
Class	JSS 2	11 (13.4)	71 (86.6)	82	32.32	2	0.00
	JSS 3	3 (1.1)	273 (98.9)	276			
	SS 1	0 (0.0)	62 (100.0)	62			
	Total	14	406	420			
Mother's educational status	Primary	5 (11.9)	37 (88.1)	42	12.85	2	0.002
	Secondary	6 (4.1)	140 (95.9)	146			
	Tertiary	3 (1.3)	229 (98.7)	232			
	Total	14	406	420			

DISCUSSION

This research work using a descriptive cross-sectional survey assessed the knowledge and experience of menarche among secondary school female students in Nnewi. From literature review this is the first study of its kind ever done in female secondary school in Nnewi, Anambra State. The study aimed to determine the knowledge and experiences of menarche among secondary school female students. 420 students

participated in the research work, and 91.4% of the students were aware of menarche before menstruation. This is like the work done among secondary school girls in Oyo state in Nigeria where 96.4% were aware of menses before its onset.[15] Also, the work done in Ethiopia in 2021 showed that 93.3% of the students were aware of menarche before the onset.[16]

Concerning the mean age at menarche, there is a paradoxical finding in the mean age to compare with the previous studies. The mean age is 12.02±1.15. Work done in Nigeria showed the mean age at menarche to be 13.7 years, 13 years in South Africa, 12.7 years in Canada, and 12.9 years in the United Kingdom.[17-19] Although most of the students had their menarche at the age of 13 years accounting for 35.7%, the decrease in the mean age could be a result of nutritional, biological, and some environmental exposures. More work should be done to ascertain the reasons and factors contributing to this drastic reduction in the mean age of menarche. School authorities in collaboration with the Ministry of Health need to make the school environment conducive for female students by incorporating them into the school curriculum on reproductive education.

In this study, 68.6% of the student's primary source of information about menstruation was from their mothers, in a study done in India, 70% of the students got their first information on menstruation from their mothers.[20] Work done in Ethiopia show that 41.8% got their first information about menstruation from their mother, in another work done at Oyo state in Nigeria, 41.83% got their first information about menstruation before menarche from their mothers.[16,15] 69.8% of students got their secondary information about menarche from peer groups and this was in tandem with study done in Ethiopia, were 77.1% of the student's secondary sources of information about menstruation were from friends.[16]

In this study, 86.9% believed menstruation to be a normal physiological change that occurs at puberty and 87.1% knew that menstruation will not continue forever. Similar work was done in Ethiopia were 94.2% respondents believed to be normal physiology. From this study, there is a higher knowledge of the source of menstrual blood 80.2% of the students believed it to come from the uterus, in the study done in Oyo state in Nigeria 22.37% said the blood comes from the uterus.

On the initial perception of menstruation before menarche, 71.7% believed it to be normal physiology, 20.7% of the students believed it to be a symptom of an illness while 7.6% saw it as a sign of life-threatening disease. From this, it can be deduced that a good number of the students had good knowledge of menstruation before its onset and there is better knowledge as the students started seeing their menses. However, some of them still have little or no knowledge and more effort should be made to enlighten the young ones about their reproductive life at a younger age.

The experience of menarche, 191 students (45.5%) felt normal during their menarche, however, 165 students (39.3%) were afraid, and 54 students (12.9%) were ashamed during their menarche. 45% of the respondents had mood swings before menarche, and 60% of the respondents were irritated during their menarche. On the level of preparedness, half (50%) of the respondents said to be prepared while the other half (50%) were not ready to receive menarche. This shows that despite the good knowledge of most respondents, some were still not ready to experience menarche when it started.[21-25]

The strength of this study lies in its broad scope and the fact that it was school-based and thus allowed for a better representation of the population of the students with minimal selection bias. The study tried to evaluate the knowledge and experience regarding menarche among secondary school female students in Nnewi by recruiting female data collectors to minimize social desirability bias. However, the limitation of this study includes firstly, the cross-sectional nature of the study design might not show the cause-and-effect relationship between study variables. Secondly, this study follows only quantitative data collection, and it is not triangulated by mixed approaches. Hence, further longitudinal, and mixed approach study designs with more exhaustive and mutually exclusive categories of variables are recommended.

This study has some limitations. The time of administering the questionnaire coincided with the respondents' learning time and as such, getting their consent to fill the questionnaire was difficult since they had several teachers waiting to give them lectures. However, questionnaires were administered during their break period to prevent any disturbance in their learning period.

CONCLUSION

This study has shown the levels of knowledge, mean age, and experience of menarche among secondary school female students in Nnewi, Anambra State of Nigeria. Based on the findings, the study, therefore, concludes that to a reasonable extent, there exists a good knowledge and experience of menarche among secondary school female students in Nnewi. There is a paradoxical reduction in the mean age of menarche among secondary school female students in Nnewi. The decrease in the mean age could be a result of nutritional, biological, and environmental exposures. More work should be done to ascertain the reason and factors contributing to this drastic reduction in the mean age of menarche. There exists a good knowledge of menarche among secondary school female students in Nnewi with a majority of their source of information from their mothers. However, despite this good knowledge of menarche, most of the students had poor experiences during menarche. This is due to the unpreparedness of the students before the onset of menarche.

Recommendations

Awareness campaigns/counseling sessions regarding menstruation need to be recommended for schools and parents. Stakeholders within the educational system, the Ministry of Health, School heads, and teachers to map out a good plan for educating young female students on menstruation especially those in Primary schools since the age of menarche starts earlier. Also, early inclusion of reproductive health programs particularly on menstruation in the curriculum for both Primary and secondary school girls would further strengthen their knowledge of menstruation.

In addition, government needs to put in place enabling policies and implement frameworks for achieving menstrual education, particularly for the young ones by providing necessary tools for learning and subsidizing the cost of disposable sanitary pads to schoolgirls who cannot afford the cost, and where possible, to make them free and easy to access. NGOs and Health workers should join hands in educating young girls and parents by conducting advocacies in secondary schools, churches, and marketplaces to create awareness of menstruation and its effect.

Menstrual education can immensely improve with measures such as the radical orientation of parents and teachers on the need to educate young girls, through health seminars and workshops, and including menstrual education in the school curriculum.

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