

## Effectiveness of Structured-Teaching-Programme on Adolescents' Knowledge of Early Pubertal Changes and Menstrual Hygiene in Selected Secondary Schools in Sapele, Delta State, Nigeria

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### ABSTRACT

**Background:** Knowledge about reproductive health is important for healthy sexual behavior of adolescents. Adolescents unarguably possess some knowledge about reproductive health, but effective educational intervention is required to encourage more sensible and healthier behavior. Hence, the researchers decided to use the medium of structured-teaching-programme [STP] to improve the knowledge of school going female adolescents on early pubertal changes [EPC] and menstrual hygiene [MH] in Sapele, Delta State.

**Methods:** A Quasi experimental design was adopted. 389 school-going adolescents [229 in the experimental group and 160 in the control group] were selected by multistage sampling from four secondary schools in Sapele. Knowledge was assessed using a researcher developed pre and post-test validated and reliable instrument. One week after the pretest was conducted, STP was administered by the researchers to the experimental group which lasted 4weeks. Thereafter post-test was conducted on both groups. Data was collated using SPSS software for windows version 22. Hypotheses were tested with Chi-square [ $\chi^2$ ] and ANOVA.

**Results:** Results revealed that the mean age of the research participants was [13±2.1, n=389]. All four [4] schools had similar pre-entry knowledge of EPC [9.02±2.23; 8.79±2.18; 8.23±1.96 & 7.0±2.27] and MH [11.51±1.94; 11.38±2.32; 10.45±2.39 & 10.84±2.60]. The STP was effective as post test scores revealed a knowledge gain of [4.033 & 5.60, P=0.000] for knowledge of EPC and [3.53 & 1.92, P=0.000] for knowledge of MH in the experimental groups. No significant increase in knowledge was observed in the control groups for EPC and MH. Statistical analysis done [ANOVA] revealed an association between knowledge of EPC and MH based on their school type [P=0.000; 0.004] but no association [chi-square] was found between knowledge of EPC and MH based on their age [P=0.380 & 0.234].

**Conclusion:** It was concluded that STP is effective in improving the knowledge of adolescents on EPH and MH among school going adolescents.

**Keywords:** knowledge, structured-teaching-programme, early pubertal changes, menstrual hygiene, adolescents.

### BACKGROUND OF THE STUDY

Menstruation and puberty are natural processes but often, it is linked with several misconceptions and malpractices which may result in adverse health outcomes [1]. Poor hygiene during menstruation has been associated with serious ill-health, including reproductive tract and urinary tract infections [2]. During menarche, girls experience different feelings including fear, shame and guilt because of lack of prior information about menstruation.

The onset of puberty is accompanied with a lot of biological changes especially in adolescent

girls. Puberty is not an instant in time but takes 3 to 5 years to occur starting earlier in girls than boys [3]. According to [4], the initiation of puberty is due to changed functions in the hormone control region of the brain called the hypothalamus, which starts to release a master control hormone. As a result, the progression of puberty is associated with the development of certain aspects of brain function particularly the development of psychosexual thoughts which are reflected in the interests and behavior of the young person transitioning puberty.

Also, the age at which reproductive health education is given is as important as the content

of such teaching [2]. This is because adolescents however, become sexually active in younger ages and it is advocated that due attention be given to reproductive health education early in adolescents school life [when pubertal changes begin] for healthy sexuality and prevention of many related problems all over the world [5]. Although students are taught early pubertal changes and menstrual hygiene in integrated science in Junior Secondary Schools, this knowledge seems inadequate or not effective [6]. Hence there is a need to introduce other methods of teaching as well as specific content upgrade.

Furthermore, single sex high schools are claimed to have more serious and studious climates which are more immune to the dominant rating and dating culture [7]. By contrast, co-educational high schools are portrayed as “jungles of dating and social maneuver” in which overly aroused adolescents are pressurized into early experimentation, which results in warped cross-gender socialization and gender confusion. As a result, adolescent girls in co-educational schools are adjudged more knowledgeable about pubertal changes and reproductive health than their counterparts in single sex schools [7].

Knowledge about reproductive health is important for healthy sexual behavior of adolescents though it may not be translated into behavior. There is lack of adequate information about pubertal changes and parental guidance to meet with changes in pubertal period. This leads to anxiety and misconceptions in the mind of young adolescents especially females which hinders their healthy growth [8]. It has been proven [9] scientifically that higher level of sexual knowledge is associated with a later onset of sexual activity. This association underlines the importance of a comprehensive policy on reproductive health education [10]. Studies [9,11] have shown that a good way to decrease absenteeism in schools especially among adolescent girls is by giving puberty lessons and free sanitary products to girls in African countries.

In many parts of the developing countries, a culture of silence surrounds the topic of menstruation and related issues [12,13]. As a result, many young girls lack appropriate and sufficient information regarding menstrual

hygiene. This results in incorrect and unhealthy practices during their menstrual period. Also, many mothers lack correct information and skills to communicate about menstrual hygiene which they pass on to their children, leading to poor attitude, beliefs, and practices in this regard [14]. The introduction of sexuality education into secondary schools in Nigeria generated a lot of tension amongst parents and religious scholars [15].

These challenges may be particularly acute for economically disadvantaged girls across low-income countries, who due to situations of poverty, may attend the least girl-friendly school environments and come from families who perceive the onset of menstruation as an appropriate age at which to withdraw a girl from school for reasons of early marriage, household care-taking, and/or income-generating activities [16]. Some studies [16,17] have concluded that reproductive health is ignored, and queries go unanswered.

Given the limited resources that exist at both the national and global level for effective education and health-related interventions, social and fiscal policies must rely on the best evidence to date to direct country-level programming. The teacher has the greatest potential to influence the student's education, while a student achievement is related to teacher's competence in using different methods of teaching [18]. Thus, students achieve more when teachers employ systematic teaching procedures and programmes that make teaching and learning processes easier. Furthermore, learning about pubertal changes and hygiene during menstruation is a vital aspect of health education for adolescent girls as patterns that are developed in adolescence are likely to persist into adult life. Consequent upon the above, the researchers decided to use the medium of a structured teaching program to educate and improve adolescent girls' knowledge of early pubertal changes and menstrual hygiene.

## **METHODS**

### **Research Design & Population**

The research design for the study is quasi experimental with one group pre-test and post-test design and a control group. The target population for this study was all junior

secondary school girls in public school in Sapele Local Government Area. There are 11 public secondary schools in Sapele town, Delta State of which one is a single sex [male] school. The total population of students in these 11 schools is about 11,214 students [19]. The population of female students in JSS 2 of the remaining 10 public secondary schools in Sapele Local Government Area is about 5,607 female students as at 2017/2018 academic session.

### **Sampling Technique**

Multi-stage sampling technique was used to select the schools that were used for the study as the population of secondary school students in Sapele is widely distributed.

First stage - Sapele has three types of school structures namely Public schools, Semi-Private schools, and Private schools. Out of these schools, public schools were purposefully selected because public schools had the greatest number of students.

Second stage - A sampling frame of all the public secondary schools [excluding the same sex male school] in Sapele Local Government was drawn and a representative sample of 4 secondary schools by simple random sampling was selected namely Chude Girls Grammar Schools [CGGS], Urhiapele Mixed Secondary School [UMSS], Ufuoma Secondary School and Orodje Grammar school [OGS]. Balloting was done to allocate schools into the control and experimental groups.

Third stage - proportionate stratified random sampling method was used to determine the proportion of the sample size that were used for the study in each of the selected schools to get a total of 444 female students who met the inclusion criteria.

121 students from CGGS and 116 students from OGS were allotted to the experimental groups while 96 students from UMSS and 116 students from USS were allotted to the control groups. However, of the 444 students recruited for the study, only 389 were included in the data analysis as some students did not partake in the post test in the control groups and some students in the experimental groups did not attend all four [4] classes of the structured teaching programme.

### **Sample Size Determination**

The Taro Yamane formula was used for sample size determination and for estimating proportion in a finite population less than 10,000. The minimum sample size for this research study was 400 students. However, adjusted calculated sample size for non-response rate was 444 students [Bamgboye, 2014]

### **Research Instrument & Ethical consideration**

Data was collected using a self-structured pre and post-test instrument. The pre and posttest instrument were divided into three [3] sections to capture the demographic data, students' knowledge of early pubertal changes and menstrual hygiene.

Consent was sought from the principals of the selected schools; approval was obtained from the Delta State Ministry of Basic and Secondary Examination [DSMBSE] and purpose of the research explained.

### **Procedure of Data Collection and Analysis**

The respondents were intimated on the purpose of the study, consent from all the principals were obtained and the students were requested to respond to the questions as well as partake in the delivery of the structured teaching programme for the experimental group. The control groups continued receiving their usual integrated science lesson from their teachers and were not a part of the structured teaching programme but were required to respond to the pre and post-test instrument at two [2] weeks interval. The structured teaching programme was delivered by the researchers to prevent inter teacher variation. Each student responded to the pre and post-test individually. Structured Teaching Programme [STP] was a presentation of 30-35min duration administered over four [4] contact classes and was structured to give information on early pubertal changes and menstrual hygiene.

A mean difference between the pre and post-test was used to measure the effectiveness of the STP while a mean score of less than 10 [ $<10$ ] was categorized as poor knowledge and a mean score greater than 10 [ $>10$ ] was categorized as good knowledge

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**RESULTS**

**Table1.** Demographic characteristics of research respondents

Demographics	Categories	Frequency [F]	Percentage [%]
Age [years]	10-12	120	30.8
	13-15	243	62.5
	16-18	24	6.2
	19-21	2	0.5
	<b>Total</b>	<b>389</b>	<b>100.0</b>
Ethnic group	Yoruba	24	8
	Igbo	62	15.9
	Hausa	10	2.5
	Urhobo	245	63
	Ijaw	31	6.2
	Others	17	4.4
	<b>Total</b>	<b>389</b>	<b>100.0</b>
Religion	Christianity	379	97.5
	Islam	10	2.5
	<b>Total</b>	<b>389</b>	<b>100.0</b>
School type	Single schools	120	30.9
	Co-educational schools	269	69.1
	<b>Total</b>	<b>389</b>	<b>100.0</b>

From Table 1, the mean age of the students was 13±2.1. Vulnerable age group according to the chart is 13-15years. 63% of the respondents were Urhobo's, 97.5% of the respondents were Christians. 69.1% of the respondents attended co-educational schools while 30.9% attended single-sex schools.

**Table2.** Pre-test result on Knowledge of early pubertal changes and menstrual hygiene for both the control and experimental groups. **n=389**

	Groups	Schools	No of students	Mean	S.D.	Variance
Knowledge of early pubertal changes	Experimental	CGMS	120	9.02	2.23	4.97
		OGS	109	8.79	2.18	4.74
	Control	UMSS	87	8.23	1.96	3.85
		USS	73	7.0	2.27	5.19
Knowledge of menstrual hygiene	Experimental	CGMS	120	11.51	1.95	3.79
		OGS	109	11.38	2.32	5.40
	Control	UMSS	87	10.45	2.39	5.72
		USS	73	10.84	2.60	6.76

From Table 2, the pre-knowledge of adolescents on early pubertal changes was poor [less than average of 10] in both the control and experimental groups.

**Table3.** Pre and Post-test result on knowledge of early pubertal changes and menstrual hygiene for the experimental groups. **n=389**

Variable	Phase	Subjects	Means	SD	Mean Difference	T	Df	P-value
Knowledge of early pubertal changes	Pre test	120	9.017	2.23	4.033	-11.103	119	.000
	Post-test	120	13.050	2.14				
	Pre test	109	8.780	2.177	5.600	-6.269	108	.000
	Post-test	109	14.38	1.641				
Knowledge of menstrual hygiene.	Pre test	120	11.51	1.950	4.53	-6.136	119	.000
	Post-test	120	15.04	2.416				
	Pre-test	109	11.38	2.325	1.92	-7.025	108	0.000
	Post-test	109	13.30	1.619				

\*Mean difference (subtract the pre-test mean score from the post-test mean score)

From Table 3, the results of the paired sample t-test were significant, [ t(120)= -11.10 p<0.05, n=120 and t(109)= -6.26 p<0.05, n=109] indicating that there is a significant increase in the knowledge of early pubertal changes scores from the pretest [M=9.017±2.213, n=120 and M=8.78±2.17, n=109] to the post test [M=13.05±2.14, n=120 and M=14.38±1.64, n=109]. The mean increases were 4.03 and

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5.60 with the 95% confidence interval. Thus, the structured teaching program was effective in improving adolescents' knowledge of early pubertal changes.

Also, the results of the paired sample t-test were significant, [ $t(119) = -6.136$   $P < 0.05$ ,  $n = 120$  and  $t(108) = -7.025$   $p < 0.05$ ,  $n = 109$ ] indicating that there is a significant increase in the knowledge of menstrual hygiene scores from the pretest [ $M = 11.51 \pm 1.95$ ,  $n = 120$  and  $M = 11.38 \pm 2.32$ ,  $n = 109$ ] to the post test [ $M = 15.04 \pm 2.42$ ,  $n = 120$  and  $M = 13.30 \pm 1.62$ ,  $n = 109$ ]. The mean increases were 4.53 and 1.92 with the 95% confidence interval. Thus, the structured teaching program was effective in improving adolescents' knowledge of menstrual hygiene.

**Table 4.** Comparison of the pre and post-test mean scores of adolescents on Knowledge of early pubertal changes in both (experimental and control) groups

Variable	Groups	Phase	Subjects (n)	Means	SD	Mean Difference
Knowledge of early pubertal changes	E	Pre test	120	9.017	2.23	4.033
		post-test	120	13.050	2.14	
	E	Pre test	109	8.780	2.177	5.600
		Post-test	109	14.38	1.641	
	C	Pre test	87	8.23	1.96	-0.29
		Post test	87	7.94	2.59	
C	Pre test	73	7.0	2.27	-0.6	
	Post test	73	6.40	2.78		

\*Key

Mean Difference (subtract pretest from post-test in each school)

E – Experimental group

C – Control group

From Table 4, the students in the experimental groups gained more scores for early pubertal changes than those in the control groups. The pretest mean scores which were  $9.02 \pm 2.23$  and  $8.79 \pm 2.18$  increased to  $13.45 \pm 2.12$  and  $14.38 \pm 1.65$  in the post test of the experimental groups while no significant increase in scores [pretest  $8.23 \pm 1.96$  and  $7.0 \pm 2.27$  vs  $7.94 \pm 2.59$  and  $6.40 \pm 2.78$ ] were observed in the control groups. The knowledge gain for the experimental groups were [4.3 and 5.6] while a knowledge deficit [-0.29 and -0.6] was recorded in the control groups.

**Table 5.** Comparison of the pre and post-test mean scores of adolescents on Knowledge of menstrual hygiene in both (experimental and control) groups

Variable	Group	Phase	Subjects (n)	Means	SD	Mean Difference
Knowledge of menstrual hygiene	E	Pre test	120	11.51	1.9	4.53
		posttest	120	15.04	2.4	
	E	Pre test	109	11.38	2.3	1.92
		Posttest	109	13.30	1.6	
	C	Pre test	87	10.45	2.39	-0.27
		Posttest	87	10.18	2.63	
	C	Pre test	73	10.84	2.60	-1.07
		Posttest	73	9.77	2.80	

From Table 5, the students in the experimental groups gained more scores for early pubertal changes and menstrual hygiene than those in the control groups. The pretest mean scores which were  $11.51 \pm 1.9$  and  $11.38 \pm 2.3$  increased to  $15.04 \pm 2.4$  and  $13.30 \pm 1.6$  in the post test of the experimental groups while no significant increase in scores [ $10.45 \pm 2.39$  and  $10.84 \pm 2.60$  vs  $10.18 \pm 2.63$  and  $9.77 \pm 2.80$ ] were observed in the control groups. The knowledge gain for the experimental groups were [4.53 and 1.92] while a knowledge deficit [-0.27 and -1.07] was recorded in the control groups.

**Table 6.** Chi-square test showing the association between adolescents' knowledge of early pubertal changes and menstrual hygiene based on their age groups.

Age	Knowledge of early pubertal changes		$\chi^2$	df	P
	Good	Poor			
			4.199*	2	.380
9-12years	69	47			
13-16years	140	126			
17-20years	5	2			

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		214	175			
		<b>Knowledge of menstrual hygiene</b>		2.901*	2	.234
<b>Age</b>		Good	Poor			
	9-12years	99	18			
	13-16years	211	54			
	17-20years	6	1			
		316	73			

The statistical analysis in Table 6 using chi-square [ $X^2$ ] revealed that no significant relationship was found between knowledge of menstrual hygiene [ $P=0.234$  at 0.005 level of significance] and Early Pubertal Changes [ $P=0.380$  at 0.005 level of significance] based on their ages.

**Table7.** ANOVA showing the association between school types and mean score knowledge of adolescents on early pubertal changes and menstrual hygiene in selected secondary schools in Sapele.

	School type	N	Mean score	Std. deviation	Std. Error	95% Confidence Interval for Mean		Min.	Max.
						Lower Bound	Upper Bound		
Early Pubertal changes	Single sex	120	9.02	2.230	.2036	8.6135	9.4198	2.00	15.00
	CO-Ed	109	8.79	2.178	.2086	8.3755	9.2024	2.00	13.00
	CO-Ed	87	8.23	1.963	.2105	7.8115	8.6483	3.00	13.00
	CO-Ed	73	7.0	2.279	.2668	6.4682	7.5318	1.00	11.00
	Total	389	8.3985	2.28015	.11561	8.1712	8.6258	1.00	15.00
Menstrual hygiene	Single sex	120	11.5083	1.94891	.17791	11.1561	11.8606	5.00	17.00
	CO-Ed	109	11.3761	2.32454	.22265	10.9348	11.8175	6.00	17.00
	CO-Ed	87	10.4483	2.39067	.25631	9.9388	10.9578	5.00	20.00
	CO-Ed	73	10.8493	2.60166	.30450	10.2423	11.4563	3.00	15.00
	Total	389	11.1105	2.31771	.11751	10.8795	11.3416	3.00	20.00

ANOVA					
Knowledge of Early Pubertal Changes					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	207.723	3	69.241	14.732	.000
Within Groups	1809.516	385	4.700		
Total	2017.239	388			

ANOVA					
Knowledge of Menstrual Hygiene					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	69.817	3	23.272	4.448	.004
Within Groups	2014.429	385	5.232		
Total	2084.247	388			

The statistical analysis using ANOVA in Table 7 revealed that there is a significant relationship between knowledge of menstrual hygiene based on their school type [ $P=0.000$ ] and knowledge of early pubertal changes based on their school type [ $P=0.004$ ].

### DISCUSSION OF FINDINGS

#### Knowledge of Adolescents on Early Pubertal Changes

In assessing the knowledge of adolescents on early pubertal changes, findings revealed that all the schools had similar pre-entry knowledge mean score [ $9.02 \pm 2.23$ ,  $8.79 \pm 2.18$ ,  $8.23 \pm 1.96$  and  $7.0 \pm 2.27$ ] which was poor [less than 10 in a scale of 20]. This poor knowledge observed among the respondents can be attributed to the fact that some parents [which

are among the primary source of information to these students] lack adequate information about pubertal changes and are beclouded with some myths about pubertal development in females which they in turn teach their children.

This finding corroborates the studies of [1] and [2] that adolescents' response to pubertal changes has been inadequately served and due attention be given to reproductive health education for health sexuality and prevention of many related problems. Similarly, [8] documented that there is a lack of adequate

information about pubertal changes and parental guidance to meet with these changes in the pubertal period leading to anxiety and misconceptions in the mind of young adolescents especially females which hinders their health growth.

Contrarily, the study of [14] revealed that most adolescents have good knowledge of pubertal changes. Thus, this implies that most adolescents in Sapele, Delta state have a poor knowledge of early pubertal changes and as such are at risk of unhealthy and risky sexual practices as observed by [10] who reported that higher levels of reproductive health knowledge are associated with a later onset of sexual activity.

It is therefore recommended that adolescents especially females should be given education within the school context regarding pubertal changes before the onset of puberty as this has the potential for improving their coping ability in future and leading to a healthy life.

### **Knowledge of Adolescents on Menstrual Hygiene**

In assessing the knowledge of adolescents on menstrual hygiene, findings revealed that all the schools had similar pre-entry knowledge mean score [ $11.51 \pm 1.95$ ,  $11.38 \pm 2.32$ ,  $10.45 \pm 2.39$  and  $10.84 \pm 2.60$ ] which was good [greater than 10 in a scale of 20]. This is expected because Sapele is largely an urban town and menstrual materials are easily accessible to the respondents.

This finding supports the finding of [20] that most adolescents have fair knowledge of menstruation and menstrual hygiene although deficient in specific knowledge areas. Similar findings were also reported by [21] that 40.6% of respondents had good knowledge of menstrual hygiene.

Furthermore, the study of [8] revealed that 40% of their study participants [female adolescents] were deficient in knowledge about menstruation. Also, in [8] study, girls' menstrual knowledge was positively associated with parental education. This poor knowledge of adolescents on menstrual hygiene is detrimental to the health of adolescents as this may result in incorrect and unhealthy behavior during their menstrual periods as opined by [12].

It is therefore recommended that timely information and education on menstrual hygiene be given to adolescents by teachers to improve

their knowledge of menstrual hygiene as most mothers lack correct information and skills to communicate about menstrual hygiene which they pass on their children leading to poor attitude, belief and practice in this regard.

### **Effectiveness of Structured Teaching Program on Adolescents' Knowledge of Early Pubertal Changes**

In determining the effectiveness of structured teaching program on adolescents knowledge of early pubertal changes, the results of the paired sample t-test were significant, [ $t(119) = -11.10$   $p < 0.05$ ,  $n = 120$  and  $t(108) = -6.26$   $p < 0.05$ ,  $n = 109$ ] indicating that there is a significant increase in the knowledge of early pubertal changes scores from the pretest to the post-test [ $M = 9.017 \pm 2.213$ ,  $n = 120$  and  $M = 8.78 \pm 2.17$ ,  $n = 109$ ] vs [ $M = 13.05 \pm 2.14$ ,  $n = 120$  and  $M = 14.38 \pm 1.64$ ,  $n = 109$ ]. The mean increases were 4.43 and 5.60 with the 95% confidence interval in the experimental group. This increase in knowledge can solely be attributed to the study intervention [structured teaching program] as no increase in knowledge was observed in the control groups despite the usual classes on integrated science which they were receiving at the time of data collection. Furthermore, despite the low performance of students in the pretest, no personal effort was made by the students in the control groups [evident by a decline in their knowledge mean scores] to improve their knowledge through personal study or research further buttressing the importance of teaching and guidance to students at this class and age.

This finding highly corroborates the findings of Dhital et al [6] who recorded an increase [ $39.83 \pm 16.89$  vs  $84.60 \pm 10.60$ ] in the knowledge of adolescents on reproductive health after the introduction of a structured teaching program. However, Dhital et al [6] recorded a 4.4 mean increase in their control group. Also, [22] reported similar findings in their study of knowledge gain of respondents from 1.96 to 14.25 in the experimental group following the administration of pubertal preparedness programme and no obvious increase was recorded in their control group.

It is therefore concluded that structured teaching program is effective in improving the knowledge of adolescents on early pubertal changes and this should be introduced in the curricula of Junior Secondary School students in Sapele, Delta State.

### **Effectiveness of Structured Teaching Program on Adolescents' Knowledge of Menstrual Hygiene**

In determining the effectiveness of structured teaching program on adolescent's knowledge of menstrual hygiene, the results of the paired sample t-test were significant, [t(119)= -6.136 P<0.05, n=120 and t(108) = -7.025 p<0.05, n=109] indicating that there is a significant increase in the knowledge of menstrual hygiene scores from the pretest [M=11.51±1.95, n=120 and M=11.38±2.32, n=109] to the post test [M=15.04±2.42, n=120 and M=13.30±1.62, n=109]. The mean increases were 3.53 and 1.92 with the 95% confidence interval in the experimental group.

This increase in knowledge was expected and is solely attributed to the study intervention [structured teaching program] as no knowledge gain was observed in the control groups despite the usual classes on integrated science which they received as at the time of data collection. Again, despite the low performance of students in the pretest, no personal effort was made by the students in the control groups [evident by a decline in their knowledge mean scores] to improve their knowledge out of curiosity, through personal study and/or research further buttressing the importance of teaching and guidance to students at this class and age within the school context.

This finding agrees with the findings of [23] who reported an 82.4% increase in knowledge as against 51% recorded in the pretest following an introduction of a school based menstrual education program among adolescent females. Furthermore, [24] reported that inappropriate experience of menarche, adverse effect of menstruation on schooling and social life and the use of unhygienic menstrual absorbents were common in girls who had no pre-menarcheal training [control group] in their study than those who did.

### **Relationship between Age and Knowledge of Adolescents on Early Pubertal Changes and Menstrual Hygiene**

The statistical analysis [Chi square at P<0.05 level of significance] showed that there is no significant relationship between the age and knowledge of adolescents on early pubertal changes [P= 0.141, 0.728, 0.309 & 0.197] and menstrual hygiene [0.149, 0.728, 0.432 & 0.532] in all four schools. This implies that all

respondents had equal knowledge of early pubertal changes and menstrual hygiene irrespective of their age which was inadequate [less than 10 on a scale of 20]. This calls for concern as adolescents are increasingly becoming sexually active in younger ages [25] with inadequate reproductive health education. Furthermore, just as [2] ascertained that the age at which reproductive health education is given is as important as the content of such teaching, due attention needs be given to reproductive health education early in adolescents school life [when pubertal changes begin] for healthy sexuality and prevention of many related problems later on in life. If younger adolescents are not granted access to age-appropriate reproductive health education, the tendency to get involved in risky sexual health practices increases which are likely to persist into adult life.

### **Relationship between School Type and Knowledge of Adolescents' On Early Pubertal Changes and Menstrual Hygiene**

The statistical analysis [ANOVA] showed that there is a statistically significant difference between the school type and knowledge of adolescents on early pubertal changes and menstrual hygiene in Sapele. This finding agrees with the findings of [7] that adolescent girls in co-educational schools are adjudged more knowledgeable about pubertal changes and reproductive health than their counterparts in single sex schools. This is due to the presence of boys in the school which often initiate sexual discussion and make advances to their female counterparts. Furthermore, this finding corroborates the finding of [26] that single sex schools increase students gender salience and reduces opportunities for mixed-gender interactions

On the other hand, these places female school-going adolescents in single sex schools at a disadvantage as they tend to have lesser knowledge of sexuality. Hence, more attention and sexuality education need to be given to female adolescents in single sex schools as they are at greater risk of developing unhealthy sexual behaviors and patterns which are likely to persist into adulthood.

### **RECOMMENDATIONS**

Based on the result of the study, the following recommendations were made:



- There is the need to educate adolescents [especially females in Delta State] regarding pubertal changes before the onset of puberty as this has the potential of improving their coping ability in future and leading to a healthy life.
- Target specific sexuality education should be inculcated into the syllabi of adolescents in Junior Secondary Schools in Delta State [not just as a topic in biology in senior secondary schools] before the onset of these pubertal changes to prevent risky sexual behaviours.
- Proper training and health education [by teachers, family members, health educators, and media] is recommended to eliminate misconceptions regarding menstrual hygiene.
- Public and school health nurses should properly assess the knowledge and menstrual hygiene needs of female adolescents and develop policies/interventions to address these needs.

## CONCLUSION

Female adolescents in junior secondary schools [especially single sex schools] do not have adequate knowledge about early pubertal changes. Effective means of disseminating age-appropriate information to female adolescents on early pubertal changes and menstrual hygiene will greatly help in improving adolescent's knowledge of early pubertal changes and menstrual hygiene. The study also revealed that structured teaching program within the context of the school is effective in improving the knowledge of adolescents on early pubertal changes and menstrual hygiene. This is a wakeup call to academic and health educators on the need to introduce target specific pubertal, reproductive health and sexuality education into the syllabi of Junior Secondary School students [not just as a topic in biology in senior secondary schools] and/or before the onset of these pubertal changes to equip students with adequate knowledge.

## IMPLICATION OF THE STUDY

The findings of this study revealed that the knowledge of adolescents on early pubertal changes and menstrual hygiene is inadequate. This calls for interventions to improve the knowledge of adolescents on these concepts. This study also provides evidence that students

achieve more when teachers employ systematic teaching procedures and programs to make the teaching and learning process easier thus reiterating the need for teachers to be sensitized on the importance of reproductive and sexual health as well as improved methods of communicating this important topic to the students. Furthermore, the study has revealed that the best timing and context for pubertal education is one that is provided within the context of a comprehensive sexuality education integrated into a broader skill-based health education curriculum.

## AUTHORS' CONTRIBUTION

1. Primary researcher and write up of the manuscript
2. Research supervisor [conceptualization, field work and manuscript draft]
3. Research supervisor [conceptualization, field work and manuscript draft]

## REFERENCES

- [1] Asgupta, A. & Sarkar, M. Menstrual hygiene: How hygienic is the adolescent girl. *Indian Journal of Community Medicine*. 2008;33 (2):77–80.
- [2] Prateek, S. & Saurabh, R. A cross sectional study of knowledge and practices about reproductive health among female adolescents in an urban slum of Mumbai. *J Fam Reprod Health*.2011; 5(4): 117–124
- [3] Feirer, S. & Kives, S. “Polycystic ovary syndrome in the adolescent”. *Obstetrics & Gynaecology Clinic.N*; 2009;36 (1): 129-52.
- [4] Cohen, D. & Ball, D In Schneider B, McDonald, S., Rowman, K. & Littlefield Educational innovation and the problem of scale. *Scale-Up in Education*. Plymouth. 2007; 2 (15): 19-36.
- [5] Abeer, E., Houaida, H.& Wafaa, E. Menstrual attitude and knowledge among Egyptian female adolescents. *Journal of American Science*. 2012;8 (6):555–565.
- [6] Mosharaf H. Miazil, Taleb Hossain and C. Tiroyakosil. Structured-exercise-program (SEP): An effective training approach to key healthcare professionals 2012.
- [7] Fred A. Mael. Single sex and co-educational schooling: relationships to socioemotional and academic development. *American institutes for research*. 1988.
- [8] Paul, M. Menstruation and the cycle of poverty: a cluster quasi-randomised control trial of sanitary pad and puberty education provision in Uganda. 2016.

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- [9] Walker, E., Mayes, B. Ramsay, H. et al. Socio-demographic and clinical characteristics of Jamaican adolescents with HIV/AIDS. *West Indian Medical Journal*. 2004; 53 (5): 332-8
- [10] Lloyd, K. &Hornsby, L. Complementary and Alternative Medications for Women's Health Issues. *Nutrition in Clinical Practice*. 2009. <https://doi.org/10.1177/0884533609343001>
- [11] Abioye-Kuteyi, E. Menstrual knowledge and practices amongst secondary school girls in Ilese, Nigeria. *Perspectives in Public Health Journal*. 2000; 120 (1): 23-6
- [12] Suneela, G., Nandini, S. & Ragini, S. Socio-cultural Aspects of Menstruation in an Urban Slum in Delhi, India. *Reproductive Health Matters* 2001; 9 (17): 16-25.
- [13] Olayinka, O. & Akinyinka, O. Unmet Need for Sexuality Education among Adolescent Girls in Southwest Nigeria: A Qualitative Analysis. *African Journal of Reproductive Health*. 2004; (3): 27-37.
- [14] Vibha, K. Knowledge and coping patterns among adolescents. *Nightingale nursing times*. 2010; 6(9): 34-38
- [15] Lawan, U., Nafisa, W. & Aisha, B. Women's Health and Action Research Centre (WHARC) Menstruation and Menstrual Hygiene amongst Adolescent School Girls in Kano, Northwestern Nigeria. *African Journal of Reproductive*. 2010; 14(3): 201-207
- [16] Sommer, M. Using participatory and quantitative methodologies for effective menstrual-hygiene management policy and programming', paper presented at the GPIA-UNICEF Adolescent Girls Conference, New York. 2010.
- [17] Upadhyay, D., Dhungel, B., Das, P. & Karki, B. Perception of adolescent boys regarding pubertal changes (physical, emotional and psychological) from urban slum area of Mumbai. *Indian Journal of Public Health Research and Development* 2012; 42-46
- [18] Kidzu Oweh in Serena Smith (2010). Level of use and effectiveness of some select method of teaching economics in secondary schools.
- [19] Delta state post primary education board 2018.
- [20] Lawan, Yusuf & Musa. menstruation and menstrual hygiene amongst adolescent school girls in kano, Northwestern Nigeria. *African Journal of Reproductive Health*. 2010; DOI:10.431\AJRH.V1413
- [21] Adhikari, P., Kadel, B., Dhungel, S., Mandal, A. & Kathmandu I. Knowledge and practice regarding menstrual hygiene in rural adolescent girls of Nepal. *Kumath University Medical Journal*. 2007; 5(3): 382-6.
- [22] Sheoran, P., Rani, M., Kumar, Y. & Singh, N. Knowledge and Attitude Regarding Pubertal Changes among Pre-Adolescent Boys: An Interventional Study in Rural Area in India. *Journal of nurses care*. 2016; doi:10.4172/2167-1168.1000370
- [23] Syed Emdadul Haque, Mosiur Rahman, Kawashima Itsuko, Mahmuda Mutahara, Kayako Sakisaka. The effect of a school-based educational intervention on menstrual health: an intervention study among adolescent girls in Bangladesh 2014;
- [24] Aniebue, U., Aniebue, P. & Nwankwo, T. The impact of pre-menarcheal training on menstrual practices and hygiene of Nigerian schoolgirls. *Pan African Medical Journal* 2009; 2(9).
- [25] Abeer, E., Houaida, H. & Wafaa, E. Menstrual attitude and knowledge among Egyptian female adolescents. *Journal of American Science*. 2012; 8 (6): 555-565.
- [26] Wong WI, Shi SY, Chen Z. Students from single-sex schools are more gender-salient and more anxious in mixed-gender situations: Results from high school and college samples. 2018; 13(12). doi: 10.1371/journal.pone.0208707. PMID: 30532270; PMCID: PMC6286141.

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