



Adolescent Morbidity Pattern in Nigeria: Is the Pattern Changing?

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Authors' contributions

This work was carried out in collaboration between both authors. Author WW conceptualized the study, wrote the abstract and discussion section. Author TGO wrote the introduction, methodology and result section. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/IJTDH/2024/v45i61548

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/115812>

Original Research Article

Received: 14/02/2024

Accepted: 18/04/2024

Published: 11/05/2024

ABSTRACT

Background: Adolescents make up a large and growing percentage of populations in the world, especially in the developing nations. They have peculiar health needs which are often neglected due to paucity of data from our health institutions and non-implementation of existing adolescent health policies.

Objective: The aim of the study was to determine the morbidity pattern among adolescents attending the Paediatric outpatient clinic of a tertiary health facility.

Methodology: This was a cross-sectional study of adolescents aged 10-17 years seen at the Paediatric Outpatient Clinic (POPC) from first of July to 31st of December 2022. Consent was obtained from parents/caregivers and assent from the adolescents. The socio-demographic data obtained from them as well as the clinical details and diagnoses made by attending physicians were recorded in the study proforma. Data was analyzed with IBM Statistical Package for the Social Sciences version 23 and data presented in tables and charts.

Results: A total of 136 adolescents were enrolled in the study with a male: female ratio of 1:1.6. Most 90 (66.2%) were early adolescents, attended private secondary schools and belonged to the

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middle socioeconomic class. The commonest presenting complaints were body pains 24 (17.6%), convulsion 22 (16.2%) and cough 17 (12.5%). The three commonest diagnoses made were epilepsy 25(18.4%), respiratory tract infections 15 (11%), and sickle cell disease (9.6%). Non-communicable diseases (61%) were more prevalent, but there was no statistical difference in its prevalence among their socio-demographic characteristics. Eleven (8.1%) had surgical diagnoses such as appendicitis, inguino-scrotal hernia and ganglion.

Conclusion: The morbidity pattern of adolescents in the study consisted of medical and surgical diagnoses. There appears to be a shift in morbidity pattern from communicable to non-communicable diseases among adolescents in the locality and this may be put into consideration in policy formulation for adolescents.

Keywords: Adolescent; communicable; morbidity pattern; non-communicable; paediatric outpatient clinic; tertiary health facility.

1. INTRODUCTION

An adolescent is defined by the World Health Organization (WHO) [1] and the United Nations (UN) [2] as an individual aged 10 to 19 years. Adolescence is divided into three - early (10-13 years), middle (14-16 years) and late adolescence (>16 years) [1]. Adolescence is a period of rapid growth and development, physiologically, psychologically and socially. During this phase, adolescents establish patterns of behaviour related to diet, physical activity, substance use, and sexual activity, that can protect their health and the health of others around them, or otherwise put their health at risk, both now and in the future [1].

Globally, there are an estimated 1.2 to 1.3 billion adolescents [1,2] making up 16% of the world's population. About 90% of them, representing four out of every five adolescents, live in low and middle income countries [1,2]. According to the most recent national population and housing census (the 2006 Census), adolescents constitute 22% of Nigeria's population [3]. In Rivers State, Nigeria, adolescents make up about 23.3% of the total population of 7,829,815, with the average age of the residents being 18 years [4]. They are therefore a sizeable group whose problems need to be highlighted hence a national health guideline was developed in Nigeria to handle this unique set of people [3].

Adolescence is the pivotal period of transition from childhood to adulthood and offers an opportunity for consolidation of the earlier health investments in the childhood years and for laying the critical foundation for a healthy adulthood [3]. Investments in adolescent health and wellbeing bring a triple dividend of benefits in terms of the life cycle impact. It has benefits to adolescents in

their current phase of life, benefits in terms of their future adult life, as well as benefits for the next generation of children who the adolescents would be parents to [3].

Adolescents are said to be less vulnerable to diseases of infancy and the elderly hence inadequate emphasis has been paid to diseases of adolescence leading to a paucity of data on morbidity pattern of adolescents [5]. Despite being thought of as a healthy stage of life, there is significant mortalities, illnesses and injuries in the adolescent years [1,6]. This age group is important as the foundation for many adult diseases is laid here and presents an opportunity for prevention and treatment of such diseases [6]. Historically, this cohort has been largely neglected by the healthcare system, which has had its primary focus on the health needs of women, children under five years, and the elderly [7]. Where adolescents' health needs have been recognized, the focus of service delivery has largely been through the lens of sexual and reproductive healthcare services including human immunodeficiency virus infection (HIV) [7]. Notwithstanding the importance of sexual and reproductive healthcare services for young people, there is increasing consensus that the extent and breadth of the burden of disease in adolescents and young adults requires a far wider response from the healthcare system [7]. The Nigerian policy for the health and development of adolescents has therefore metamorphosed from addressing mainly interventions in the areas of sexual and reproductive health to include other areas of adolescent health such as oral health, communicable diseases, non-communicable disease (NCD) like cancer, cardiovascular disease, diabetes mellitus etc [3]. Although much is known about what should be done to improve adolescent health, research on adolescent health

has tended to lag behind research in both child and adult health [8].

Previous studies in Ebonyi and Cross Rivers States in Nigeria and India identified both infectious (communicable) and non-infectious (non-communicable) disorders in adolescents [5,9,10]. There is a paucity of data in this locale, hence, this study will enable us determine the baseline prevalence of common disorders among adolescents seen in our health facility and the pattern of such disorders. In addition, it will enable policy makers and health facility managers make adequate provisions for adolescent health care including having a dedicated clinic for adolescents.

2. METHODOLOGY

This was a prospective cross-sectional study conducted in the Paediatric Outpatient Clinic (POPC) of the Rivers State University Teaching Hospital (RSUTH) over a six-month period, from first of July to 31st of December, 2022.

The RSUTH is a 350-bedded hospital located in the heart of Port Harcourt, the capital of Rivers State, Nigeria. The hospital has many departments within it including Paediatrics, Internal Medicine, Surgery, Family Medicine, Obstetrics and Gynaecology, Pharmacy, Nursing, Physiotherapy, Nutrition, Medical records and Hospital administration among others. Being a tertiary health facility, RSUTH receives patients referred from other health care facilities within and outside the State as well as self-referred patients.

The POPC opens from Monday to Friday and is run by consultants and resident doctors. These clinics attend to patients aged 0-17 years. Patients are clerked, examined, investigated and diagnosis made. Appropriate treatment is given as required.

Convenience sampling technique was used to consecutively recruit from the clinic, adolescents aged 10-17 years, whose parents and or caregivers gave consent and the adolescent gave assent. Using a pretested semi-structured questionnaire, the biodata of the adolescents and their parents/caregivers were collected. The diagnosis made during the course of consultation was obtained and documented. Socio-economic status was determined using the Oyediji Classification of socio-economic status [11]. Data obtained were analyzed using the Statistical Package for Social Sciences (SPSS) version 24

by IBM New York. Results are presented as tables and charts. A p-value of <0.05 was regarded as significant at 95% confidence interval.

3. RESULTS

A total of 149 adolescents were recruited into the study. However, only 136 adolescents with complete data were analyzed for this study. Those who were being investigated before making a definitive diagnosis but did not return for subsequent reviews were removed from the study.

3.1 Socio-Demographic Profile of Adolescents

They were aged 10-17 years with a median age of 12 years and mean of 12.53 ± 2.06 years. Of the 136 adolescents, 90 (66.2%) were early adolescents aged 10-13 years. There was a slight female preponderance with 73 (53.7%) females and 63 (46.3%) males. Almost all of them were Christians 135 (99.3%) and 121 (89%) resided in urban areas in the State. The number of children of their parents ranged from 1-10, with a mean of 3.1 ± 1.5 children, 58 (42.6%) of them were of the first birth order and 17 (12.4%) of the third birth order. All the adolescents in this study were attending school with 57 (41.7%) and 39 (28.7%) in junior and senior secondary schools respectively. Majority of them, 82 (60.2%) attended private schools, Table 1.

3.2 The Health Profile of Adolescents

Of the 73 female adolescents, 42 (58.3%) had attained menarche ranging from 10 – 17 years which included 14 (33.3%) aged 10-11 years with early menarche. The average age at which menarche was attained was 12.83 ± 2.11 years at a median age of 13 years. Thirty-one (41.7%) adolescents aged 10-16 years with a mean of 12.39 ± 1.69 were yet to attain menarche. There was no statistically significant difference in the mean age of those who had achieved menarche and those who had not, $p = 0.45$. There was a 9 times statistically increased odds of adolescents with higher educational levels achieving menarche than those with lower educational level, (Table 2).

3.3 Morbidity Pattern of Adolescents

The most common complaints of adolescents who presented to paediatricians in the clinic

was pains in different parts of the body in 24 (17.6%) adolescents, followed by convulsion 22 (16.2%) and cough 17 (12.5%) and others as shown in Fig. 1. Other symptoms were passage of watery stools, fainting spells,

palpitation, sore throat, weight loss, ear and vaginal discharge. Of the 24 adolescents that complained of pain, it was mostly located in the abdomen in 35.2% of cases and in the chest (29.5%), Fig. 2.

Table 1. Socio- demographic characteristics of the study population

Demographic characteristics	Frequency (N =136)	Percent (%)
Age group		
10-13 (Early adolescents)	90	66.2
14-16 (Mid adolescents)	41	30.1
> 16 (late adolescents)	5	3.7
No of children in the family		
1	20	14.7
2	26	19.1
3	45	33.1
4	27	19.9
> 4	18	13.2
Birth order		
1 st	58	42.6
2 nd	40	29.4
3 rd	17	12.5
≥ 4	21	15.4
Socioeconomic status of family		
I	15	11.0
II	35	25.7
III	64	47.1
IV	20	14.7
V	2	1.5
Educational level of adolescents		
No formal education	0	0.0
Primary education	33	24.3
Junior secondary education	57	41.9
Senior secondary education	39	28.7
Post secondary education	7	5.1
Type of educational institution attended		
Private	82	60.3
Public	54	39.7

Table 2. Characteristics of female adolescents who had attained menarche

Health parameters	Frequency (%)	Odds ratio	95% CI	P Value
Age				
10-11	14 (33.3)	1		
> 11	28 (66.7)	0.818	0.299-2.239	0.448
Place of residence				
Rural	5 (11.9)	1		
Urban	37 (88.1)	1.096	0.269-4.469	0.586
Type of school				
Private	23 (54.8)	1		
Public	19 (45.2)	0.774	0.0305-1.963	0.381
Educational level				
Primary/Junior Secondary	18 (42.9)	1		
Senior Sec/ Post Secondary	24 (57.1)	9.00	2.671-30.331	0.000

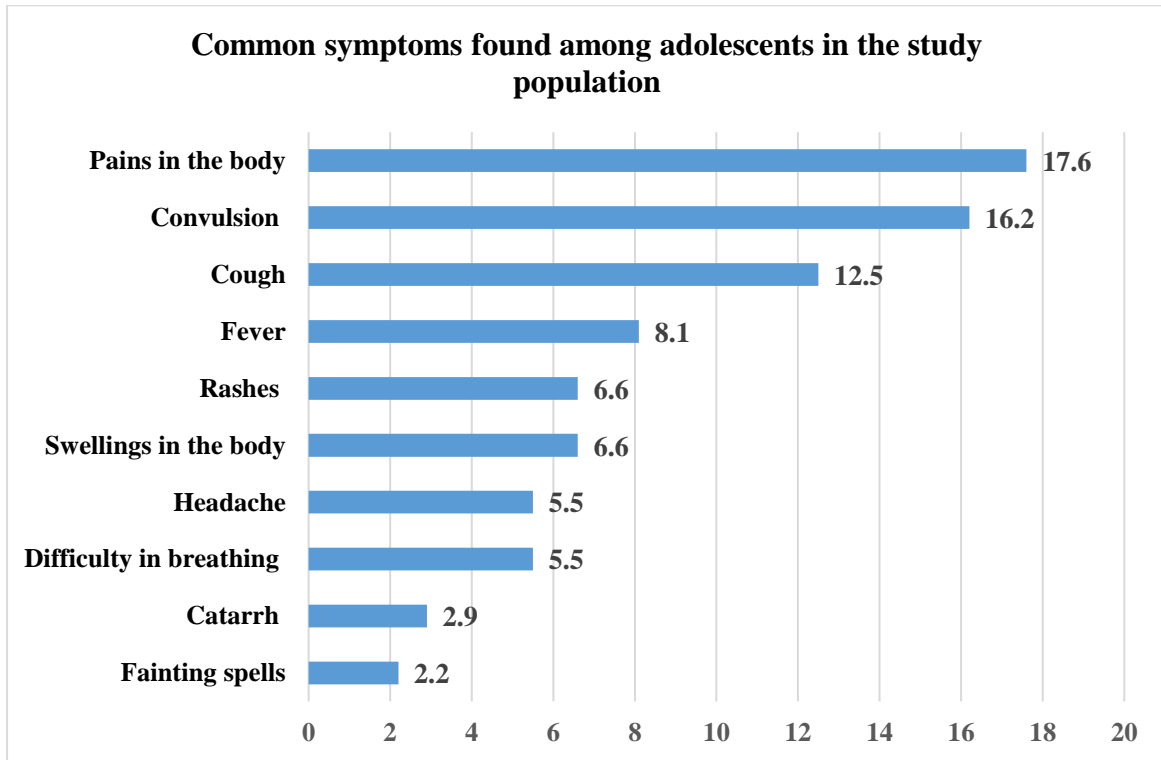


Fig. 1. Common symptoms found among adolescents in the study population

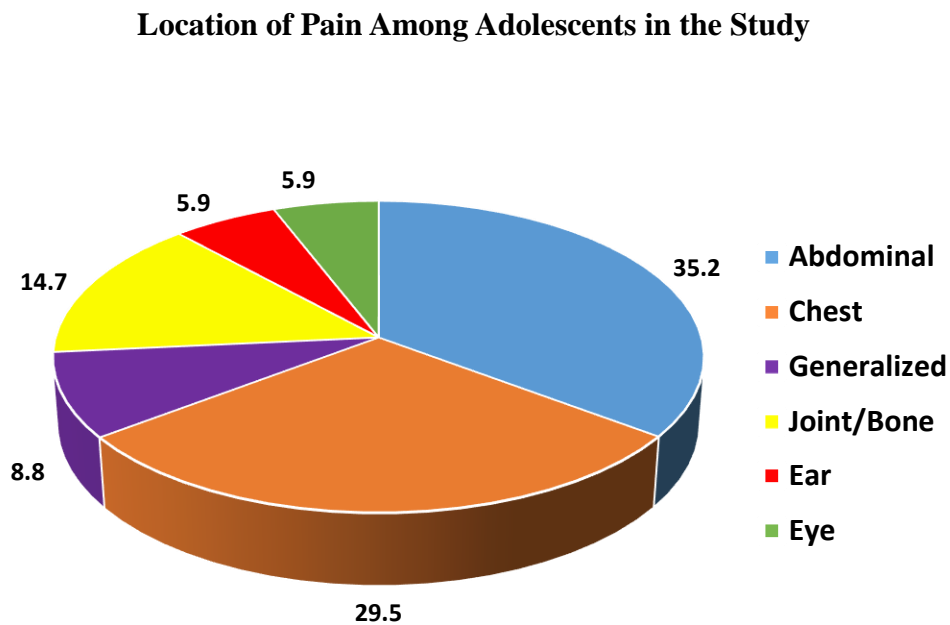


Fig. 2. Location of pain in the study population

Classification of Diseases Among Adolescents

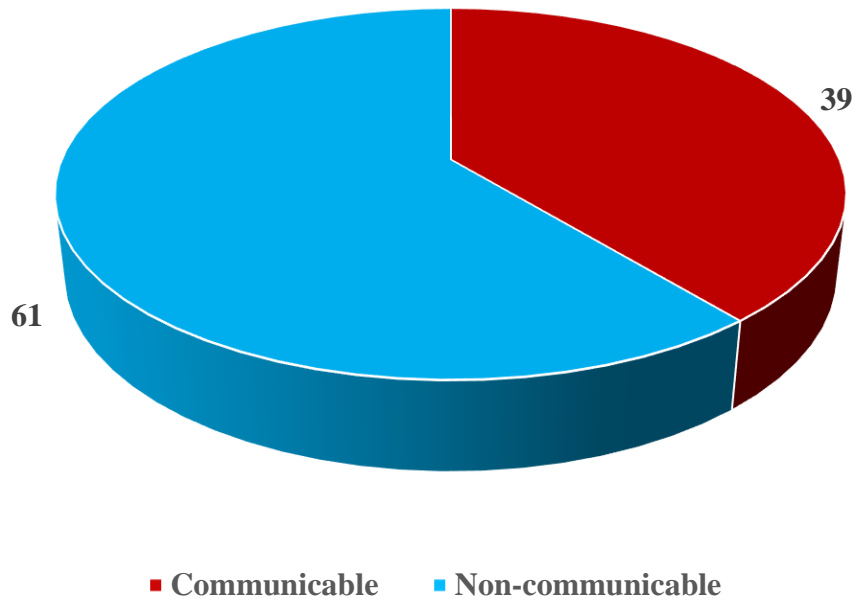


Fig. 3. Distribution of clinical diagnoses into Communicable and non-communicable diseases

Table 3. Common diagnosis made among adolescents in POPD

Diagnosis	Frequency	Percent
Communicable diseases		
Respiratory tract infection	15	11
HIV infection	9	6.6
Pulmonary tuberculosis	6	4.4
Malaria	6	4.4
Scabies	5	3.7
Furunculosis	2	1.5
Dermatitis	2	1.5
Cystitis	2	1.5
Conjunctivitis	2	1.5
Others*	4	2.9
Non-communicable diseases		
Epilepsy	25	18.4
Sickle cell disease	13	9.6
Surgical diagnosis	12	8.8
Peptic Ulcer disease	10	7.4
Asthma	4	2.9
Medical fitness	3	2.2
Arthritis	3	2.2
Trauma	3	2.2
Scoliosis	2	1.5
Others**	8	6.4
Total	136	100

*Include gastroenteritis, impetigo, vaginitis, meningitis, **angina, bleeding disorder, speech impairment, down syndrome, dysmenorrhea, hypothyroidism, sexual assault, cerebrovascular accident.

Table 4. Sociodemographic factors associated with non-communicable diseases among adolescents in the study

Socio-demographic parameters	Frequency N=83	Percent (%)	Odds ratio	95% CI	P Value
Sex					
Female	39	47	1		
Male	44	53	2.019	0.995-4.097	0.037
Age group					
10-13	54	65.1	1		
> 13	29	34.9	1.137	0.547-2.365	0.439
Place of residence					
Rural	8	9.6	1		
Urban	75	90.4	1.427	0.485-4.196	0.352
Type of school					
Private	54	65.1	1		
Public	29	34.9	0.601	0.298-1.215	0.107
Educational level					
Primary/Junior Secondary	55	66.3	1		
Senior Sec/ Post Secondary	28	33.7	0.990	0.478-2.050	0.561

Table 5. Sociodemographic factors associated with communicable diseases among adolescents in the study

Socio-demographic parameters	Frequency N=53	Percent (%)	Odds ratio	95% CI	P Value
Sex					
Female	34	64.2	1		
Male	19	35.8	0.495	0.244-1.005	0.037
Age					
10-13	36	67.9	1		
> 13	17	32.1	0.879	0.423-1.829	0.439
Place of residence					
Rural	7	13.2	1		
Urban	46	86.8	0.701	0.238-2.061	0.352
Type of school					
Private	28	52.8	1		
Public	25	47.2	1.663	0.823-3.359	0.107
Educational level					
Primary/Junior Secondary	35	66	1		
Senior Sec/ Post Secondary	18	34	1.010	0.488-2.098	0.561

Non-communicable diseases 83(61%) were more prevalent than communicable diseases among adolescents in this study, Fig. 3. The three commonest diagnoses made among the adolescents were seizure disorder 25(18.4%), respiratory tract infections 15 (11%), and Sickle cell disease (9.6%). While respiratory tract infection was the most common communicable disease, epilepsy was the most common non-communicable disease. Twelve (8.8%) adolescents were referred for surgical evaluation following surgical diagnoses such as appendicitis, inguinoscrotal hernia, ganglion and keloid. Another 3 (2.2%) were seen in the clinic for school entry medical fitness evaluation, Table 3.

Although non-communicable diseases were more prevalent among males and adolescents living in urban areas, the difference was not statistically significant, Table 4. Conversely, the odds of having a communicable disease were higher among female and early (10-13 years) adolescents but it was not statistically significant, Table 5.

4. DISCUSSION

This study on adolescent morbidity pattern in a tertiary health facility in Nigeria over a period of six months showed most enrolled adolescents were females, early adolescents of the middle

socio-economic class. The 136 adolescents seen in POPC consisted more of females 73(53.7%) than males 63(46.3%) giving a male: female ratio of 0.9:1. This is similar to the finding in a secondary facility in Akwa-Ibom [9] and Abakaliki [5] but different from the study in Abuja [12] and Saudi Arabia[13] where males were more commonly seen. The exact reason for this is however not known.

Their most common presenting complaints were body pains, convulsion and cough. This is similar to an international study by Swain et al which showed that somatic pains were common in adolescence [14].

The most frequent diagnoses were epileptic seizures, respiratory tract infections and sickle cell disease unlike in the Abakaliki [5] study where the most common diagnoses were malaria, gastrointestinal disorders (peptic ulcer disease, helminthiasis), gastroenteritis and liver disease) and genitourinary disorders (pelvic inflammatory disease, urinary tract infection, vaginal candidiasis, sexually transmitted diseases). The difference may be from the fact the Abakaliki study [5] also included young adults aged 19-24 years. In Akwa Ibom [9], most of the diagnoses (>70%) were infectious in origin unlike our study where most diagnoses were of non-infectious origin. It is possible that this difference may be because in Akwa Ibom the study [9] involved people admitted into the emergency room with complicated malaria alone accounting for up to 24% of the admitted cases. In Saudi, communicable causes were also the most common morbidity [13]. The lower number of communicable diseases in our study may reflect a change from disorders of infectious origin to those of non-infectious origin.

Sivagurunathan et al in India [15] reported that respiratory tract infections, gastrointestinal tract disorders which included gastritis and diarrhoea diseases were the more common morbidities among adolescents in their study. Meanwhile, the diagnosis of seizure disorder was made in only 1.5% of adolescents in that study. The differences observed in these studies could be as a result of changes in epidemiology of adolescent health over time and the fact that some disorders may be more peculiar to certain geographical areas. It could also be attributed to the fact that the Abakaliki study included young adults aged 19-24 years [5].

It is quite interesting, that in an earlier study in Akwa Ibom state, Nigeria, [9] carried out about 7

years ago, more than 70% of adolescents who participated in that study had communicable diseases. This finding was in agreement with what was reported by a study in Saudi Arabia [14]. This is however in contrast with our study, where non-communicable diseases were more prevalent. It is possible that this difference may be because in Akwa Ibom the study included both inpatients and outpatients, while this study excluded patients in patients in the emergency room. The higher proportion of non-communicable diseases in our study may, perhaps, reflect a change in the epidemiology of diseases among adolescents from communicable to non-communicable disorders. Besides, the World Health Organization has declared that the increasing global prevalence of non-communicable diseases among children and adolescent is a threat to their health and is responsible for increasing mortality among them [16]. We observed that socio-demographic factors such as age, sex, place of residence and educational level were not significantly associated with NCD. While the study did not aim to identify risk factors associated with NCD, it has opened up a direction for further research in the future, in terms of monitoring the trends in our locality and identifying the risk factors associated with it.

About 71.5% of the adolescents in this study attained menarche early (ie before the age of 12 years) with the average age of attainment of menarche being 11.6 years. This is higher than earlier reports of 24.5% in Benin City Nigeria [17], 18-25% from United States of America [18] 14.6% in Canada, [19] 25.2 -27.4% from Urban China [20] and 6-14% from Indonesia [21]. The reason for this difference may not be unconnected to the small sample size of our study although our report is in keeping with the international report of the reduction in age at menarche globally This may increase the risk of early coitage and teenage pregnancy.

Menarche is said to be delayed if a girl fails to attain menarche after 16 years of age [22]. There was no incidence of delayed menarche in this study as no female beyond 16 years was yet to menstruate. Of course, this has eliminated any form of anxiety in the parents in this study as it was not a reason for coming to the hospital. The mean age of attaining menarche of 12.83 ±2.11 years was comparable to that reported earlier by Osemenkha et al in Benin City, Nigeria [17] and Yu et al in Korea [23]. However, about a third of

the female participants had attained menarche before age of 12 years, which is considered as early menarche. This proportion is lower than that reported in a South Korea study, where 42% of adolescent girls attained menarche early. Although this study did not explore the sexual experiences of these adolescents, Ibitoye et al in their systematic review of the effect of early menarche on the reproductive health of adolescents, found out that early sexual initiation, early pregnancy and sexually transmitted diseases were associated with it [24].

5. CONCLUSION

The adolescents presented with mainly medical illnesses to the Paediatric clinics with a preponderance for NCD. This highlights the need to have health personnel and equipment targeted towards their specific health needs and challenges.

CONSENT

Consent was obtained from parents/caregivers and assent from the adolescents.

ETHICAL APPROVAL

Ethical clearance for the study was gotten from Ethics Committee of the Rivers State Hospitals Management Board.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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