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PREVALENCE AND FACTORS ASSOCIATED WITH SEXUAL HARASSMENT AMONG FEMALE UNDERGRADUATE STUDENTS OF A TERTIARY INSTITUTION IN SOKOTO STATE, NIGERIA

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ABSTRACT

INTRODUCTION

Sexual harassment has become a public health problem in higher institutions globally. Females are more vulnerable, considered weak and given less attention hence have lower voices. This study assessed the prevalence and factors associated with sexual harassment among female undergraduates in a tertiary institution in Sokoto State.

MATERIALS AND METHODS

A cross-sectional study was conducted among 232 female undergraduates in Sokoto between March and April 2021. The respondents were selected by multi-stage sampling technique. Data was collected using a semi-structured self-administered questionnaire (ODK). Descriptive statistics was done, as well as inferential statistics to determine significant association ($p<0.05$).

RESULTS

The lifetime and current prevalence of sexual harassment among the respondents were 44.8% and 26.7% respectively.

Education funding ($p=0.004$) and Employment status ($p=0.001$) were significantly associated with current sexual harassment while tribe was significantly associated with lifetime sexual harassment ($p=0.026$).

Female students who were unemployed were ≈6 times more likely to experience sexual harassment (SH) compared to students who were employed (OR = 5.744 [C.I = 2.015, 16.368]).

Female students who were Hausa/Fulani were ≈3 times less likely to experience sexual harassment compared to female students of other tribes (OR = 0.399 [C.I = 0.200, 0.798]).

CONCLUSION

This study showed a high lifetime and current prevalence of sexual harassment among respondents. Employment status and tribe were the predictors of sexual harassment. Sexual harassment awareness campaigns should be conducted by student associations and the school authority to enlighten/empower the students periodically.

KEYWORDS

Female undergraduates, Risk factors, Sexual harassment.

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INTRODUCTION

Sexual harassment is an unwelcomed sexual advances or comments directed against a person's sexuality by any person regardless of their association with the victim, in any setting, including home, work and school.[1] Sexual harassment often occurs in institutions expected to be peaceful, such as universities, where perpetrators include classmates,

teachers and non-academic staff.[2] In Nigeria, sexual harassment has become a contemporary issue and is prevalent in Nigerian tertiary institutions and it cuts across all cultures and faiths.[3] In recent times, there has been renewed interest in the issue of sexual harassment on university campuses, especially following a television documentary aired by the British Broadcasting Corporation.[4,5]

Sexual harassment in institutions is so pervasive that no tertiary institution seems to be exempted; from universities to polytechnics to colleges of education including religious institutions, no student is immune to it and no policy or guidelines can completely prevent it.[6,7] According to a study conducted by Human Development Research Centre (HDRC) under MDG Achievement Fund with Support from UN Women, they found that 76% of female students of higher education institutions in Bangladesh face sexual harassment within or outside campus by campus-related people.[8]

Tertiary institutions are ivory towers where academic and moral excellence is expected to be promoted. However, sexual harassment is no more a new social problem in Nigerian tertiary institutions. It has become a common deviant practice in most of the tertiary institutions in Nigeria.[9,10] It was reported that sexually harassed women had lower life satisfaction, poorer mental health, and more symptoms of Post-Traumatic Stress Disorder (PTSD) than other women who are free from sexual harassment.[10] Depending on the situation, a victim may experience extreme psychological damage, loss of social control mechanisms, stress and humiliation.[10] Sexual harassment is associated with an increased risk of anxiety, depression, and post-traumatic stress disorder, as well as diminished self-esteem, self-confidence, and psychological well-being.[11]

The incidence of sexual harassment in Nigerian universities is on the increase. In 2018, a professor was caught on tape demanding sexual intercourse to pass a female student who failed an examination at OAU (Obafemi Awolowo University), Ife.[12] Similarly, the University of Nigeria, Nsukka (UNN) suspended a lecturer of the university over sexual assault of a female student.[13] With this high incidence of sexual harassment of female students of tertiary institutions and its consequences on the victims, the sexual harassment issue is likely going to pose a threat to achieving girl child education and women empowerment in Nigeria. Boko haram insurgency that condemned the Western education system, kidnapping and assaulting of the female students in Chibok and Dapchi, Borno State and kidnapping in Jangebe, Zamfara state already posed a serious threat to achieving the girl child education and women empowerment in Northern Nigeria.[14,15] It is worth noting that sexual harassment in tertiary institutions has become the order of the day and constitutes danger to the development of female educational system in Nigeria and Northern Nigeria in particular.[9] It has created a non-conducive and unsafe learning environment for the female students which has promoted slow and uneven progress towards attaining gender equality of the Sustainable Development Goals.[9] If sexual harassment in tertiary institutions is not checked, this will negatively affect the enrolment of the girl child in tertiary institutions. Despite cases of sexual harassment in various parts of Nigeria, there are no known reported studies on the current burden of the problem in campuses within Sokoto State to the best of the researcher's knowledge. Therefore, it is important to study the problem of sexual harassment of female students in tertiary institutions in Sokoto state. This will help to gain more insight that can be applied to raise awareness, effective preventive strategies and interventions that may help in reducing the burden of the problem.

METHODS

Study Area

The study was conducted in Sokoto metropolis, Sokoto State. Sokoto State is located in the north-western part of Nigeria.[16] It lies between latitude 130 4'60"N and longitude 5015'0" E and its capital is Sokoto.[16] The projected population of the Sokoto metropolis was 641,000 as of 2020.[16] Sokoto is the location of the Usmanu Danfodiyo University, which was founded in 1975.[16]

Study design

The descriptive cross-sectional study was conducted among female undergraduates who were in 200 levels and above at Usmanu Danfodiyo University, Sokoto. Female undergraduate students who were in 200 levels but who came in through direct entry or transfer from other tertiary institutions were excluded from the study.

Sample Size Determination

The Cochrane formula for cross-sectional studies was used to calculate the minimum sample size.[17] A prevalence of 84% (0.84) from a previous study among female undergraduate students conducted in Northern Nigeria was used as "p".[9] Adjustment was made for a finite population.[17] Allowance was made for a 10% attrition rate. A total of 232 participants were recruited for the study.

Sampling Technique

A multistage sampling technique was used to select respondents.

Stage 1: Selection of Faculties from the Three Campus complexes (City campus, Usmanu Danfodiyo University Teaching Hospital campus and the main campus). All the Three Campus complexes are located in Wamakko Local Government Area of Sokoto State. Two faculties were selected from each of the three Campuses.

A total of six faculties were selected in the institution using simple random sampling by balloting.

Stage 2: Selection of Departments. One department was selected from each of the selected faculties using simple random sampling by balloting. For each of the selected departments, a proportionate allocation of questionnaires was done.

Stage 3: Selection of participants. A stratified sampling technique was used for the selection of female undergraduate students from different levels of each of the selected departments for participation in the study.

Data were collected using a semi-structured self-administered questionnaire adapted from previous sexual harassment studies.[18-20] The questionnaire was pretested, validated and administered to the participants at their institutions by the researchers using Android phones installed with Open Data Kit software.

Data analysis

Data analysis was done using IBM SPSS version 25. Socio-demographic variables were summarised using mean with standard deviation and frequencies with percentages. A Chi-square test was performed to assess the association between independent socio-demographic characteristics and sexual harassment. Binary logistic regression was used to determine the predictors of sexual harassment among the students. The level of significance was set at $p < 0.05$.

Ethical Consideration

Ethical approval was obtained from the ethics committee of the Sokoto State Ministry of Health (MOH). Participants were informed about the aim, and anticipated benefits of the study and informed consent was sought before information was collected. All information obtained was treated with the utmost confidentiality.

RESULTS

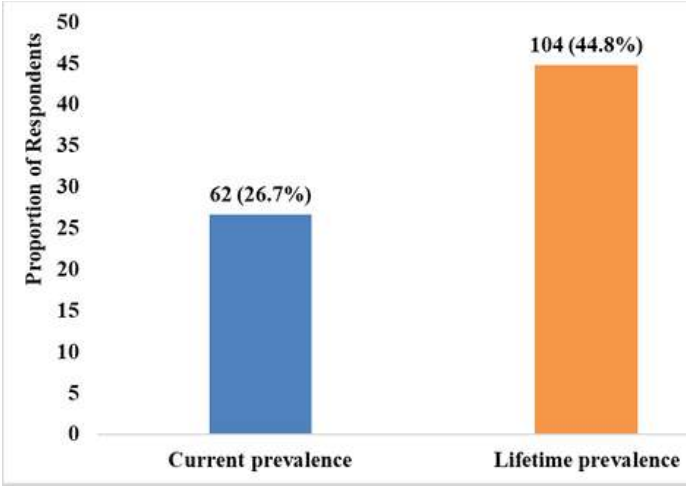

Figure 1: Respondents' current and lifetime prevalence of sexual harassment

One hundred and four of the respondents (44.8%) have experienced Sexual harassment since they have been in the institution (Lifetime prevalence) while 62 (26.7%) respondents experienced Sexual harassment within the last one year (Current prevalence) (Figure 1).

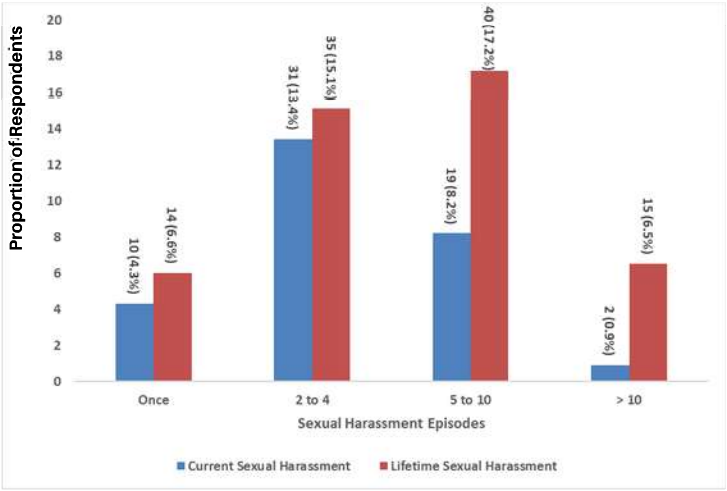

Figure 2: Frequency of current and lifetime sexual harassment experienced by respondents

One hundred and four of the respondents (44.8%) have experienced Sexual harassment since they have been in the institution (Lifetime prevalence) while 62 (26.7%) respondents experienced 2-4 episodes of sexual harassment within the last one year (Current) (Figure 2).

Table I: Factors associated with the experience of current sexual harassment among the respondents

Variables	Experienced Sexual Harassment in the past 12 month(Current)		Test statistics P - value
	Yes (n = 62) (%)	No (n = 42) (%)	
Age group (years)			
16-20	16 (59.3)	11 (40.7)	Fisher's Exact p = 0.977
21-25	42 (60.0)	28 (40.0)	
26- 30	4(57.1)	3 (42.9)	
Tribe			
Hausa/Fulani	38 (57.6)	28 (42.4)	Fisher's Exact P = 0.921
Yoruba	13 (65.0)	7 (35.0)	
Igbo	1(50.0)	1 (50.0)	
Others	10 (62.5)	6 (37.5)	
Religion			
Islam	49 (58.3)	35 (41.7)	$\chi2$ = 0.298 p = 0.585
Christianity	13 (65.0)	7 (35.0)	
Marital status			
Single	57 (58.2)	41 (41.8)	Fisher's Exact P = 0.397
Married	5 (83.3)	1 (16.7)	
Education funding			
Self	0 (0.0)	6 (100.0)	Fisher's Exact **P = 0.008**
Scholarship	20 (66.7)	10 (33.3)	
Parent	42 (60.3)	26 (39.7)	
Employment Status			
Employed	6 (27.3)	16 (72.7)	$\chi2$ = 12.123 **P = 0.001**
Unemployed	56 (68.3)	26 (31.7)	

Table II: Factors associated with the experience of lifetime sexual harassment among the respondents

Variables	Experienced Sexual Harassment in the past 12 month(Current)		Test statistics P - value
	Yes (n = 62) (%)	No (n = 42) (%)	
Age group (years)			
16-20	27 (50.9)	26 (49.1)	$\chi2$ = 1.253 p = 0.534
21-25	70 (42.7)	94 (57.3)	
26- 30	7 (50.0)	7 (50.0)	
Tribe			
Hausa/Fulani	66 (54.1)	56 (45.9)	Fisher's Exact **p = 0.026**
Yoruba	20 (37.7)	33 (62.3)	
Igbo	2 (33.3)	4 (66.7)	
Others	16 (32.0)	34 (68.0)	
Religion			
Islam	84 (43.8)	108 (56.3)	$\chi2$ = 0.743 p = 0.481
Christianity	20 (51.3)	19 (48.7)	
Marital status			
Single	98 (45.8)	116 (54.2)	$\chi2$ = 0.702 p = 0.402
Married	6 (36)	11 (64)	
Education funding			
Self	6 (64.5)	5 (45.5)	$\chi2$ = 0.976 p = 0.614
Scholarship	31 (48.4)	33 (51.6)	
Parent	67 (42.90	89 (57.1)	
Employment Status			
Employed	22 (43.1)	29 (56.9)	$\chi2$ = 0.094 p = 0.759
Unemployed	82 (45.6)	98 (54.4)	

Education funding (p=0.008) and occupation (P = 0.001) were significantly associated with current sexual harassment. Age, tribe, religion and marital status were not significantly associated with sexual harassment (p=0.977, p=0.921, p=0.585 and p=0.397 respectively) (Table I).

Tribe (p=0.026) was significantly associated with lifetime sexual harassment. Age, religion, marital status, education funding and occupation were not significantly associated with lifetime sexual harassment (p=0.534, p=0.481, p=0.402, p=0.614 and p=0.759 respectively), (Table II).

Table III: Predictors of current sexual harassment among respondents

Predictor	OR	95% C.I for OR		p-value
		Lower	Upper	
Employment Status				
Unemployed vs *Employed	5.744	2.015	16.368	0.001

Female students who were unemployed were about 6 times more likely to experience sexual harassment than students who were employed (O.R = 5.744 [2.015, 16.368]) (Table III).

Table IV: Predictors of lifetime sexual harassment among respondents

Predictor	OR	95% C.I for OR		p-value
		Lower	Upper	
Tribe				
Hausa/Fulani vs *Other tribes	0.399	0.200	0.798	0.009

Female students who are Hausa/Fulani by tribe were about 3 times less likely to experience sexual harassment than female students who were of other tribes (OR = 0.399 [C.I = 0.200, 0.798]) (Table IV).

DISCUSSION

Sexual harassment has become an increasingly worrisome public health problem in higher institutions of learning across the globe.[4,21]

This study assessed the prevalence and factors associated with sexual harassment among female undergraduate students in a tertiary institution in Sokoto State, Nigeria.

In this study, the lifetime prevalence of sexual harassment was high with a significant proportion of the female undergraduate students experiencing at least one act of sexual harassment. This compared favourably with the findings in a study on sexual harassment among female undergraduates of university of Port Harcourt, Nigeria where a lifetime prevalence of 46.7% was reported.[22] The findings is also in agreement with studies in Kano, North-western (51.7%) and Calabar, South-south Nigeria (51.7%).[23,24]

Similarly, this study's sexual harassment prevalence is within the global lifetime prevalence of 11% - 73% (median 49%) and also within national average of 4% - 68% according to Nigeria Demographic and Health Survey 2018.[21,25] The findings in this study is also similar to what was found in a cross-sectional study conducted in Kenya, which revealed that half (50%) of the students had experienced various forms of sexual harassment.[26] The findings in this study is also similar to what was found in a cross-sectional study conducted in Southwestern, Nigeria which revealed that about half of the students (48.2%) experienced sexual harassment.[9] In another study conducted in Gashua Northeast, Nigeria the prevalence was much higher (80.0%) than what was found in our study.[3] This variation in lifetime prevalence rate could be due to differences in the cultural and religious background and level of awareness about sexual harassment.

A study conducted in North-Eastern Nigeria among female undergraduate students found a prevalence rate of 13.8% which was lower than what was found in our study.[27] Another study conducted among three universities in South-Western Nigeria, found prevalence rates of 21.4% and 28.6% in two of the three universities and this was not in keeping with what was found in this study.[28] In this study over a quarter of the respondents suffered current sexual harassment within the last one year and this indicated that sexual harassment is still ongoing in the institution which was similar to the findings in a study conducted in USA which reported that approximately 20–25% of female students in the country have experienced sexual harassment.[21] But the findings in this study was in contrast to the findings in the study conducted in Imo State, Nigeria which reported a lower prevalence of current sexual harassment (15.2%).[29]

The high prevalence of sexual harassment in our study is a threat to the continuation of girl child education due to antecedent consequences that may result from the harassment. In this study, about one-fifth of the respondents experienced 5-10 episodes of sexual harassment and fewer respondents experienced more than 10 episodes of sexual

harassment, since they have been in the institution (Lifetime). A study conducted among National Youth Service Scheme members in Nigeria reported similar findings of episodes of sexual harassment suffered where about one-sixth of the respondent said to have experienced it many times.[31] In another study conducted in Norway, about one-third of the respondents experienced more than 10 episodes of sexual harassment, this was in contrast with what we found in this study where only few of the respondents experience more than 10 lifetime episodes of sexual harassment.[32] These multiple episodes of sexual harassment suffered by the students could negatively impact the outcome of their studies in the institution as more students will be wary of the school due to fear, and may develop anxiety, or depression.

Education funding and employment status were associated with current sexual harassment while tribe was found to be associated with lifetime sexual harassment. However, tribe and employment status were the predictors of lifetime and current sexual harassment respectively. In this study, it was found that female students who were Hausa/Fulani by tribe were less likely to experience sexual harassment than female students who were of other tribes; this was similar to the findings of a study conducted in Imo State, Nigeria which also reported tribe as a predictor of sexual harassment among university students.[29] Similarly, another study conducted in the USA found tribe as a predictor of sexual harassment with Latino students identified to have decreased risk for sexual harassment.[2]

In this study, it was found that female students who were unemployed were more likely to experience sexual harassment than students who were employed which was contrary to the findings in a study conducted in Edo, South-South, Nigeria, which, reported that students who self-support their education (employed) were found to be more likely to have experienced sexual abuse compared to those who did not. And this may be due to their request for favour from the lecturers as a result of distraction from their business which may affect their concentration on their studies.[30] The female students who were unemployed were more likely to experience sexual harassment in this study and this translate to less empowerment of the affected students. Therefore, they may have poor class attendance, missed lectures, missed assignments and assessment tests probably because they lack funds for transportation, feeding, etc. To compensate for these missed school activities, they may eventually have more contact with their classmates, friends and lecturers and this may predispose them to sexual harassment. This means both self-employment and lack of finances can paradoxically predispose the students to sexual harassment.

CONCLUSION

This study found a high lifetime and current prevalence of sexual harassment among female undergraduate students in a tertiary institution in Sokoto. Employment status and tribe were the predictors of current and lifetime sexual harassment respectively.

RECOMMENDATIONS

Sexual harassment awareness campaigns should be conducted periodically by student unions and the school authorities in order to give the much needed enlightenment to the students including during fresh intake of the student.

LIMITATIONS OF THE STUDY

Due to the sensitive nature of the study and fear of possible victimization, some participants may not give a reliable response to some of the questions. Though, this was minimized by assuring confidentiality.

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CONFLICT OF INTEREST

None was declared by the authors.

AUTHORS' CONTRIBUTIONS

SA conceptualized the study and contributed to data collection, analysis and manuscript writing. AH, MNS and AUM contributed to designing the study, research instrument and preparation of the final draft of the manuscript. AAN, LKA, DMZ and AA, contributed to designing the study and data collection. BMM, AMD, IHG and AHS contributed to the review of literature, data analysis and interpretation. BMB, AT, SM and AAS contributed to the review of the literature

and preparation of the final draft of the manuscript. All the authors were involved in the writing of the manuscript at the draft and the revision stages, and have thoroughly read and approved the final version.

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CASE REPORT

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GASTROESOPHAGEAL REFLUX DISEASE PRESENTING WITH ATYPICAL SYMPTOMS IN CHILDREN- CHALLENGES OF DIAGNOSIS IN SUB-SAHARAN AFRICA: TWO CASE REPORTS

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ABSTRACT

INTRODUCTION

Gastroesophageal reflux disease (GERD) is the involuntary retrograde movement of gastric contents across the lower oesophageal sphincter (LES) into the oesophagus which is associated with inconvenient symptoms or complications. It is prevalent all over the world but more has been reported in developed countries than in developing countries. This is a report of two cases of GERD in children involving a preterm neonate and an adolescent who presented to the University of Calabar Teaching Hospital with non-specific symptoms. The preterm neonate had repeated apnoea and failure to thrive while the adolescent presented with non-cardiac chest pain and abdominal pain. With review by the Paediatric Gastroenterologist, diagnosis of GERD was made and treatment commenced. Both patient showed significant improvement in their symptoms; the preterm gained weight and the apnoea stopped, while the adolescent no longer had the chest pain and abdominal pain. These two cases show that there is the need for a high index of suspicion among Paediatricians who see children with non-specific symptoms such as non-cardiac chest pain, failure to thrive and apnoea in the newborn and to refer them to the Paediatric gastroenterologists timely for proper evaluation and treatment.

KEYWORDS

Gastro-oesophageal reflux, Gastro-oesophageal reflux disease, preterm neonates, children, overweight, sub-Saharan Africa

INTRODUCTION

Gastroesophageal reflux (GER) is the involuntary passage of gastric contents into the oesophagus.[1,2] It is a normal physiologic occurrence mostly observed in infants, but also affects all age group.[1] It frequently occurs postprandial and in infants is associated with visible regurgitation of feeds.[1,3] Gastroesophageal reflux disease (GERD) occurs when the involuntary retrograde movement of gastric contents across the lower oesophageal sphincter (LES) into the oesophagus is associated with troublesome symptoms or complications.[1,4] GER occurs in approximately 50% of infants aged less than three months and in 60% of infants aged three months and above.[5-7]

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In infancy, the male female ratio of GER is 2:1.7. Approximately, 50% of infants experience regurgitation during at least one feeding session in a 24 hour period by the age of two months and this increases to 60 – 70% at the age of 3 to 4 months and above.[5-7] At 12 months of age about 5% of infants could still present with GER.[6,7] The incidence of GER in preterm neonates delivered before 34 weeks of gestational age is about 22%.[8] The prevalence of GERD in children 0 to 23 months, 2 years to 11 years, and adolescence aged 12 to 17 years

is approximately 2.2% to 12.6%, 0.6% to 4.1%, and 0.8% to 7.6% respectively.[9] Globally, an estimated 20–30% of the world's population have symptoms of GERD and about 1% of children aged 14 years or less account for this number.[10] The clinical presentation of GERD in children is non-specific, varies depending on the age of the child and maybe misdiagnosed for other medical conditions. GERD has been widely reported in developed countries in children, however, little is known about GERD in children in sub-Saharan Africa. We report two cases of GERD in children in Calabar, South-South Nigeria illustrating the challenges of diagnosis.

Case one: A preterm infant delivered at a GA of 28 weeks with a birth weight of 1.2kg, length of 35cm and head circumference of 29cm was admitted into the new born unit. Examination findings revealed a preterm male infant, in respiratory distress with oxygen saturation between 40% and 70%. On examination of the respiratory system, respiratory rate was 62 cycles/minute with crepitation in the lower lung zones bilaterally. Heart rate was 164b/min and no murmur heard. He was admitted into the new-born unit and managed as a very low birth weight preterm with respiratory distress syndrome. The oxygen saturation gradually improved within 24 hours of admission to between 96% and 98% in room air. On the 4th day of life, he developed jaundice (total bilirubin of 2.8mg/dl, and unconjugated bilirubin of 1.1mg/dl) and was commenced on phototherapy. He was on nil per os from admission and feeds commenced on the 5th day of life with expressed breast milk given at 2mls two hourly, he however, developed apnoea after feeds with vomiting. Feeds were reduced to one ml every hour, however, vomiting persisted, weight gain was poor, and feeds could not be advanced. Parenteral nutrition is not available in our hospital.The Paediatric Gastroenterologist was called to review patient on account of not tolerating feeds orally and poor weight gain. Weight on the day of review was 2.1kg at 10 weeks of age post-delivery. Oesophageal pH monitoring and upper GI endoscopy could not be done. The hospital has no neonatal endoscope and oesophageal pH monitor is not available.

A diagnosis of GERD was made, patient was managed conservatively, and protein pump inhibitor (PPI) was also commenced. With commencement of therapy, vomiting reduced significantly in frequency and volume, he began to tolerate feeds by mouth and was discharged home within two weeks of commencement of treatment. Weight on the 10th day after commencement of treatment, was 2.35kg, length was 47cm and head circumference was 32.5cm. Patient continued to show sustained improvement with good weight gain, no longer vomiting and tolerating feeds. His weight at 16 weeks, 17 weeks and 20 weeks of life were 2.75kg, 2.95kg and 3.6kg respectively. At 20 weeks of life, symptoms had completely resolved. PPI was discontinued after eight weeks of treatment

Case two: A 15-year-old female adolescent presented to the Paediatric Gastroenterology clinic with history of recurrent chest pain of two-years and recurrent abdominal pain of one-year duration. She had positive history of heart burn and several regurgitations daily. Abdominal pain was worse with intake of spicy food, radiates to the centre of the back and wakes patient up at night. Father had similar symptoms of recurrent upper abdominal pain. She was occasionally given non-steroidal anti-inflammatory drugs for the pain. On examination, she was not in painful distress, not clinically pale, had marked epigastric tenderness. Her weight was 86kg with a height of 1.68m; her BMI was 30.7kg/m2, which was between +2 and +3 z score. Other examination findings were normal.

Investigations done included Electrocardio-graphy(ECG), Echocardiography(ECHO), upper GI endoscopy and faecal antigen test for *Helicobacter pylori (H. pylori).* Findings of the ECG, ECHO were normal and Upper GI endoscopy showed no evidence of reflux oesophagitis. Faecal antigen for *H. pylori* was positive. She was commenced on protein pump inhibitor and antibiotics. Patient was also advised to reduce the intake of spicy food and to reduce weight. A repeat of faecal antigen test for *H. pylori* was negative after treatment. She was followed-up for three years and symptoms of GERD had subsided.

DISCUSSION

Gastroesophageal reflux disease (GERD) in children and adolescents have varied clinical symptoms and presentations.[7,8,12] GERD over the years have been shown to cause failure to thrive (FTT) in preterms with associated apnoea and in older children, they could present with non-cadiac chest pain.[8,13] The prevalence of GERD in Africa is believed to be increasing possibly due to demographic and epidemiologic transition.[1-4] GERD can occur at any age in children from the neonatal period to the adolescent period as seen in the two case

reports where one occurred in the neonatal period and the other in the adolescent age group. The non-specific clinical manifestations, outcome, and specific diagnostic tests, result in confusion regarding the diagnostic dilemma and treatment of GERD in children,[11] therefore a high index of suspicion in making a diagnosis especially in the neonatal period is highly required.[12] This was evident in the first case report where the neonate developed apnoea and vomiting which could occur in other clinical conditions presenting in the same age group. Dhillon et al[8] in their study noted a higher prevalence of GER in the preterm age group with most of their diagnosis being clinical and others had their diagnosis confirmed with investigations. In the same study,[8] vomiting and apnoea were the common features seen as was observed in our first case report. Investigations requested in their study was based on high index of suspicion for the disease.

In the second case report, patient only presented to the Paediatric Gastroenterology clinic after two years as a result of non-specificity of the symptom of chest pain which could mimmick cardiovascular or respiratory clinical conditions. The request for Echocardiogram and electrocardiogram was still based on the suspicion of cardiovascular origin. Nwokediuko et. al[13] corroborated this in their study where they found an overlap of symptoms of GERD with chest pain.

Abdominal pain, though non-specific is a common feature seen in children with GERD as in the second case report. Nelson et al[6] in their study, found abdominal pain was a more common presenting complaint in children aged 10-17 years which corroborates the finding in the second case report and chest pain was noted more in children aged 3-9 years of age. Diagnosis of GERD in children is based on both clinical and laboratory investigations.[1-4] Clinical studies have shown the usefulness of multichannel intraluminal impedance by confirming that non-acid volume reflux is a common cause of persistent reflux symptoms in patients receiving treatment for acid suppression[3]. Also, combining pH, pH of oro-pharyngeal mucous secretions, multichannel intraluminal impedance, and manometry has also been shown to be useful in extra-oesophageal reflux disease such as to detect cough.[14-16] This technique documents when acid or non-acid reflux triggers cough and identifies patients who would be missed or wrongly diagnosed by standard pH studies. Continuous intra-oesophageal pHmetry is currently the most reliable method of demonstrating and quantifying acid reflux.[8,14-16] Sensitivity and specificity of prolonged pHmetry in the diagnosis of GERD greater than 90%.[8] Extended (24-h) pHmetry has also been proven to be the most reliable method to identify infants and children with acid GER. Piesman et. al[17] in their study emphasized the importance of pH monitoring in determining the extent of the reflux. These investigations could not be done in our patients due to their unavailability in our clime. This poses a challenge in diagnosis and follow up of patient with GERD.

pH manometry was requested for but could not be done due to unavailability of the equipment in our clime. Our facility is one of the few in Nigeria that offers Paediatric endoscopy services which started recently in Nigeria[18] however, lack of a neonatal scope limited the neonate from benefiting from this procedure. This procedure is useful for evaluation and monitoring of structural changes of the oesophagus in suspected cases of GERD, especially in patients with increased severity of reflux symptoms where patient could present with reflux oesophagitis. Upper GI endoscopy was however, carried out in the second patient and findings were normal which is in keeping with other studies whereby GERD could be associated with either normal or abnormal findings.[1,2]

Helicobacter pylori (H. pylori) infection has been implicated as a known causative trigger of GERD.[3] The second patient had a positive test result to *H. pylori* using the faecal antigen test method. A repeat test after treatment with PPIs and antibiotics was negative. A systematic review have shown that eradication of H. pylori reduces the symptoms of GERD.[3]

In the first case report, following the diagnosis which was made clinically, feeds were reduced but symptoms of apnoea persisted until the PPIs were introduced. In some studies, supine posture has been associated with worsening symptoms.[19,20] Unfortunately, in the preterm infants, avoidance of a supine posture is near impossible and this may have contributed to worsening clinical features seen in the neonate.

Lifestyle and behavioural modification is key in the management of GERD.In the second case report, the adolescent was overweight and weight reduction was advised. Ness-jensen et. al[21] corroborated this in their study where resolution of symptoms of GERD was associated

with lifestyle modification such as weight reduction, avoidance of late night meals and other modifications.

Hoda et al[19] associated obesity with GERD in children when compared with children who were not obese. Hegar et al[5] in their study of infants over a one year period noted that partially breastfed infants were more prone to GER than their breastfed counterparts. Though the infant in the first case report was given breastmilk and symptoms persisted, other factors may have played a role. Prone or left-lateral positioning especially in neonates and infants has been found useful in the reduction of GER.[15,20] However, there are concerns about the increased risk of sudden infant death syndrome (SIDS) with both the prone and lateral positions.[22] This position was therefore not used in the preterm infant despite its usefulness.

In the treatment of GERD in infants, thickening of feeds alleviate symptoms as shown in the study by Vandeplass et. al[23] but this was not employed in the management of the preterm as breastmilk was preferred based on its accrued benefits but this posed a challenge thus medications had to be introduced.
H2 -receptor blockers have been proven efficacious in reducing gastric acid secretion and increasing intra-gastric pH,[23,24]although, its role in neonates with GER is still controversial. Proton-pump inhibitors (PPIs) have been proven to improve clinical symptoms though use of PPIs in infants have met with varied views as regards its efficacy in alleviating symptoms of GERD.[25] It was found to be useful in the management of the two cases reported in this study.

Despite that both cases had resolution of symptoms, management was challenging due to unavailability of proper diagnostic equipment, late recognition of the non-specific symptoms in the preterm neonates and the adolescent, out of pocket payment for medical services and financial constraints.

CONCLUSION

These case reports show that GERD occurs in Nigerian children including pre-term neonates and they could present with non-specific symptoms including apnoea, vomiting and failure to thrive. Though this medical condition can be successfully managed in Nigeria, challenges of late presentation also due to late recognition of the non-specific symptoms, lack of appropriate investigative equipment, financial constraints due to out of pocket payment for medical services pose challenges to management of GERD in children. Increased awareness of the disease, and access to Paediatric gastroenterologists is therefore advocated for.

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AUTHORS CONTRIBUTION

JI – Conceptualized the study and wrote up the manuscript, KU and OA -contributed to the manuscript writing, OI and FA - had an overview of the manuscript, EE critically reviewed the final manuscript.
All authors reviewed the manuscript and approved the final version for submission.

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