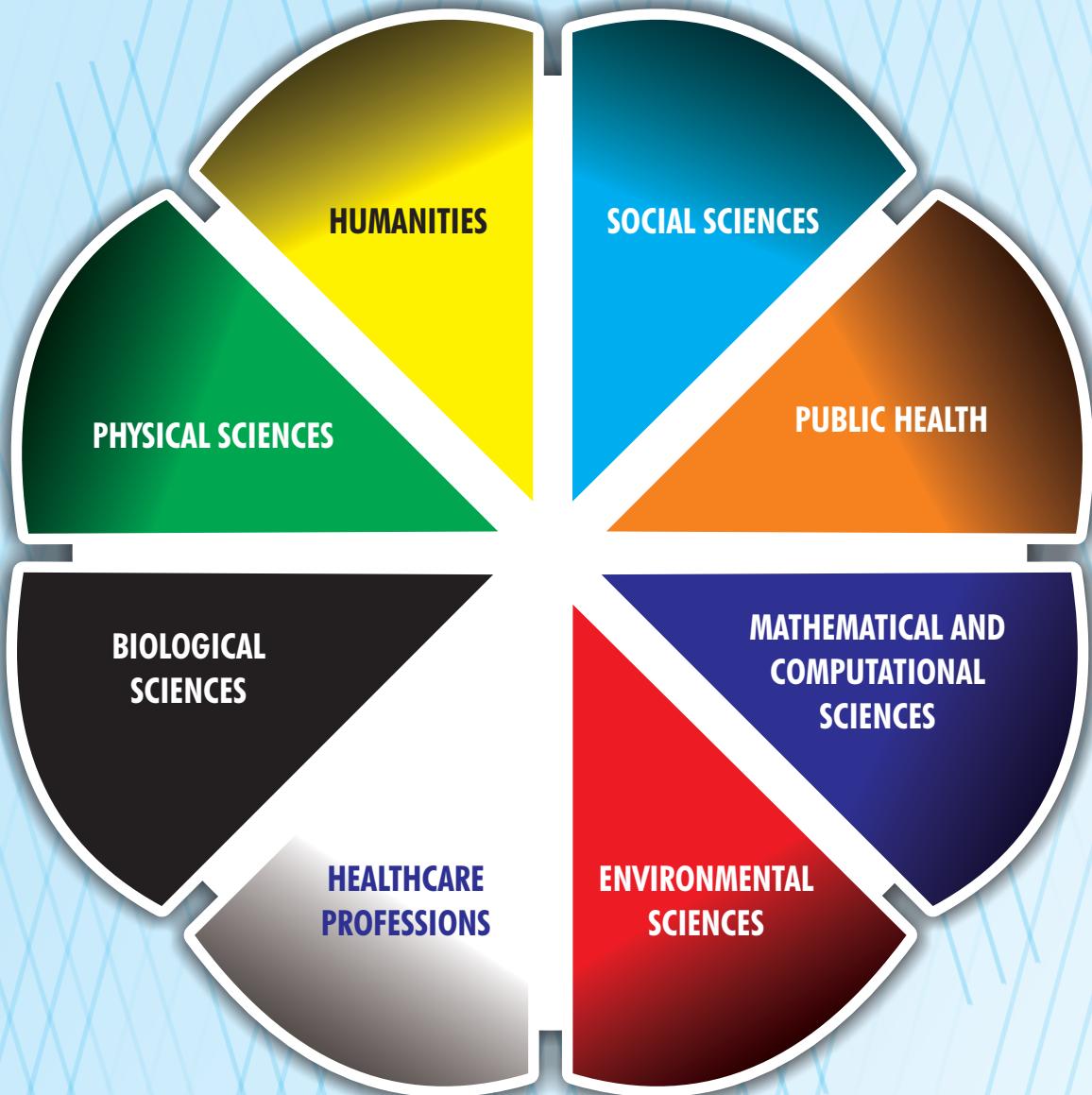


INTERNATIONAL RESEARCH JOURNAL OF MULTIDISCIPLINARY-PRACTICES, PUBLIC AND COMMUNITY HEALTH (IRJMPCH)

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MAIDEN EDITION

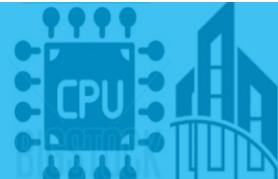
A PUBLICATION OF

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Broadcast

Ladies and gentlemen, esteemed guests, and global audience,

It is my honor to welcome you to the official launch of the International Research Journal of Multidisciplinary Practices, Public and Community Health. Today, June 1st, 2024, marks a significant milestone in our journey to advance knowledge, promote collaboration, and improve health outcomes worldwide.

As we gather here today, we acknowledge the complexity of health challenges that transcend borders, cultures, and disciplines. We recognize the urgent need for innovative solutions, evidence-based practices, and collective action. Our journal is born out of this conviction, with a vision to bridge the gaps between research, practice, and policy.

We aim to create a platform where diverse voices and perspectives converge, where interdisciplinary approaches are fostered, and where knowledge is shared to address the most pressing health issues of our time. Our scope is broad, encompassing healthcare professions, social sciences, environmental sciences, biological sciences, physical sciences, mathematical and computational sciences, and humanities.

Expected key features of our journal include:

- High-quality, peer-reviewed research articles, reviews, and case studies
- Interdisciplinary approaches to public and community health
- Global perspectives and experiences
- Innovative methodologies and frameworks
- Best practices in healthcare delivery, education, and community engagement
- Critical perspectives and analyses
- Open access and online publication
- Rapid publication process
- Rigorous peer-review process
- Indexing in major databases
- Wide dissemination and visibility

Our editorial board, reviewers, and authors come from diverse backgrounds and disciplines, united by a shared passion for improving public and community health. We are committed to maintaining the highest ethical standards, transparency, and inclusivity in our publication process.

We believe that health is a fundamental right, not a privilege. We recognize that health is influenced by social determinants, environmental factors, and economic conditions. We acknowledge the disproportionate burden of health challenges on marginalized communities and vulnerable populations.

Our journal is dedicated to addressing these challenges through a multidisciplinary approach. We will publish research that explores the intersections of health with social sciences, environmental sciences, and humanities. We will showcase innovative practices that bridge the gaps between healthcare, education, and community engagement.

We invite you to join us on this journey. Share your research, your stories, and your ideas. Engage with us through social media, webinars, and conferences. Let us work together to create a world where health is a fundamental right, not a privilege.

Thank you for your attention, and let us embark on this exciting journey together!

- Nic Maurice

...i

FROM THE *Publishers*

Dear esteemed Editorial Board Members, Reviewers, and Authors,

Representing diverse disciplines and expertise, you are the pillars of our journal's success. As we embark on this new venture, we acknowledge the vast scope of multidisciplinary practices in public and community health, encompassing:

- Healthcare professions (medicine, nursing, allied health)
- Social sciences (sociology, psychology, anthropology)
- Public health (epidemiology, health policy, health education)
- Environmental sciences (environmental health, ecology, conservation)
- Biological sciences (biology, microbiology, genetics)
- Physical sciences (physics, chemistry, engineering)
- Mathematical and computational sciences (biostatistics, data science)
- Humanities (ethics, philosophy, history)

Our mission is to create a platform where researchers, practitioners, and policymakers can converge, share ideas, and learn from each other's perspectives, fostering:

- Interdisciplinary collaboration and knowledge sharing
- Innovative research and methodologies
- Best practices in healthcare delivery, education, and community engagement
- Global collaboration and knowledge exchange

As Editorial Board Members, your guidance and expertise will help us:

- Shape the journal's direction and scope
- Ensure the quality and relevance of published articles
- Identify emerging trends and topics in multidisciplinary practices
- Develop strategic partnerships and collaborations

As Reviewers, your input is crucial in:

- Evaluating manuscripts through a rigorous and constructive peer-review process
- Providing feedback that enhances the quality and impact of published research
- Ensuring that our journal maintains the highest standards of scientific integrity and excellence

As Authors, your contributions are vital in:

- Sharing innovative research and ideas
- Showcasing best practices and case studies
- Exploring new methodologies and frameworks
- Addressing complex health issues and challenges
- Presenting theoretical and conceptual frameworks
- Sharing empirical research and data-driven findings
- Offering critical perspectives and analyses

Together, we can create a journal that:

- Breaks down disciplinary silos and fosters interdisciplinary collaboration
- Showcases cutting-edge research and innovation in public and community health
- Provides a platform for underrepresented voices and perspectives
- Informs policy and practice with evidence-based research
- Contributes to improving health equity, access, and outcomes globally
- Fosters a culture of inclusivity, diversity, and equity

We are committed to maintaining the highest ethical standards, transparency, and inclusiveness in our publication process. We will work tirelessly to ensure that our journal is:

- Indexed in major databases
- Widely disseminated and accessible to diverse audiences
- Compliant with international publication ethics and standards

Thank you for your dedication, expertise, and time. Let us work together to create a journal that makes a meaningful impact in the field of public and community health.

Please feel free to contact us with any questions, suggestions, or ideas. We look forward to collaborating with you and producing a journal that we can all be proud of.

Best regards,

Publishers

International Research Journal of Multidisciplinary Practices, Public and Community Health

About IRJMPCH

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EDITORIAL Comments

FROM THE DESK OF EDITOR-IN-CHIEF

It is with gratitude and excitement that I welcome everyone to this maiden edition of International Research Journal of Multidisciplinary Practices, public and Community health IRJMPCH. The Research Journal is a first of its kind and a single largest gathering of intellect, great minds, experts and specialists in various aspects of Public/Community Health, Sciences, Management, Humanities, Computer, Social and Environment health.

In this maiden edition of IRJMPCH, we are afforded the luxury of hardworking and cerebral minds working in academia, ministries, Non-Governmental Organization, allied bodies and international community providing various services to the public. This journal is currently enjoying affiliations with various Ministries Departments and Agencies including tertiary institutions in and outside Nigeria like Federal University Otuoke, Bayelsa State, Nigeria , Adoka University Benue State, Nigeria , Global Community Health Foundation, Cashville Development Foundation, International center of Inter-professional Team Building, Professionals for Humanity International, Caprecon Development Foundation international in USA, UK, Europe ,Asia just to mention but a few.

The Journal has a public health terrain with numerous opportunities to Young researchers, publication services, writing assistance, research/business proposal Writing, co-authorship, article modification and formatting, Data analysis and training on SPSS, STATA etc, Grantsmanship and manuscripts writing to mention but a few.

I want to assure you, we have selected, tested, trusted and renounced experts to review your Manuscripts (papers and book/book chapter) with shortest period of time and get them published immediately! Our season experts in various Fields are working round the clock to deliver, assist, mentor with their vast years of experience and mentorship.

I will like to recommend this epoch making up-to-date research journal worldwide and I will like to pay public tribute and express our deepest gratitude to founder, administrator of IRJMPCH, Mr. Anso NicMaurice, Editorial team members, Managing Editors and all staff, whose useful contributions have made this maiden edition of IRJMPCH possible and a reality.

Finally, may I state, unequivocally that, we have put everything in place to help our scholars benefits maximally from this Internationally recognized journal.

Thank you .

Dr. Efegbere Henry Akpojubaro

Associate Professor and Consultant Physician in Community Medicine and Public Health and Multi-Disciplinary Specialist and Serial Entrepreneur

Editor in Chief

IRJMPCH.

From The **MANAGING EDITOR'S DESK**

It is indeed an honor and a privilege to welcome you all to this Maiden edition of International Research Journal of Multidisciplinary Practices, public and Community health IRJMPCH. The IRJMPCH is a unique Journal, first ever, put together by highly recognized national and international developers, innovators, experts and specialists of various field of human endeavor.

We feel highly honored as Managing Editors of IRJMPCH to have enjoyed tremendous cooperation and support for scholars

On behalf of myself, I express profound gratitude to the Administrator of IRJMPCH and his team who are working round the clock to deliver.

The IRJMPCH is affiliated with Federal University Otuoke, Bayelsa State, Nigeria and Adoke University, Benue State, Nigeria, a giant step and great achievements of this top tier internationally recognized Journal.

In this maiden edition of IRJMPCH, we are poised with luxury of hardworking and cerebral minds working in academia, business and international community to provide various services to the public.

Our services are not limited to the following: publication services within 7-14 days, journal acceptance, peer reviewed process, research proposal, Dissertation assistance, Co-authorship, Grantsmanship, article modification) formatting among others.

We are top notch in accepting research/ review papers and short communication journals for our Q3 and Q4 Journal indexed.

This journal is highly recommended to our scholars including international community to publish, build and strengthen networks with the view to working collectively to collaborate much more effectively and efficiently to advancing their careers.

I wish you a fruitful, rewarding and exciting experience!
Bravo!!

Dr. Akaninyene Mark
Consultant physician Community Medicine and Public Health
Managing Editor, IRJMPCH

Contents

Call FOR Papers

International Research Journal of Multidisciplinary Practices, Public and Community health (IRJMPCH) Affiliated with 1. Federal University Otuoke, Bayelsa State, Nigeria 2. Ado-Kwata University Benue State, Nigeria. Other Universities affiliations in progress!

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- Fast publication

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- And many more!

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Dr. Efegbere Henry Akpojubaro

Associate Professor and Consultant physician in Community Medicine and Public Health
Editor-in-Chief,
IRJMPCH.

Article Guideline

FOR AUTHORS

Guideline on Short Communication

Short Communications- Manuscript Preparation

- Short Communication presents a brief observation that does not warrant a full-length paper.
- Short Communications should be limited to a total of 3000 words.
- The manuscript should be formatted without section headings in the body of the text and contain no more than 3 figures or tables, combined.

Required Sections in Short Communication

Authors, affiliations and correspondence should be provided as in full research write up.

1. Title

2. Abstract

The abstract should be limited to 100 words or fewer.

Abbreviations, diagrams and references are not allowed here.

3. Keywords

Five keywords or less should be given below the abstract.

4. Main body or Literature

-All required parts (Introduction, Materials & Methods, Results and Discussion) should be given in this single section titled "Literature", no section headings.

5. References

Preparation of original research manuscripts

Writing Style

All submitted manuscripts should be written in British English with correct syntax, grammar and punctuations. Authors are to use Times New Romans & font size 11

The Manuscripts Structure

Original manuscripts should follow this order where applicable:

Title

Name(s) of Author(s)

Address of Author(s)

Abstract

Introduction

Materials & Methods

Results

Tables, figures, etc

Discussion

Conclusion

Recommendation(s)

Limitation(s)

Acknowledgment

Reference

Conflict of interests

The authors should please comply strictly with this format for original manuscripts.

Maximum length

Text of original research articles should not exceed 4,550 words (including abstract, references, legends, tables and figures).

Unit of Measurement

The authors are to express all measurements & quantities in SI Units.

Title

The title should be concise and reflect the nature of the research and findings. The title should not be more than 155 characters.

Authors

The author(s) should provide their email addresses, full names and institutional affiliations. The corresponding author's contact details especially e-mail address and telephone number, should also be provided. (Email addresses of other Co-Authors should be provided in the cover letter).

Abstract

The abstract should have a maximum word count of 250. There should be no paragraphing of the abstract (unstructured abstract).

Keywords

A maximum of relevant 7 keywords, in alphabetical order, should be provided for indexing and coding.

The main body of article text

This should consist of a maximum of 4,250 words and sectioned into the introduction or background, materials and methods, results, discussions, conclusion, recommendation and limitation.

Introduction

This section should contain concise background information to the research, justification, hypotheses and objectives with citation of the relevant references.

Materials and Methods

The authors should provide details of the research design, materials and equipment used, and any other details which will permit reproduction of similar results by other researchers. An explicit description of interventions (or treatments) should be given. Subjects, inclusion and exclusion criteria must be stated. Statistical tests or tools for the analysis of data including the version of software employed must be provided. There must be a clear demonstration that ethical clearance was obtained before commencement of the study and all relevant regulations were followed for both human and animal studies. The anonymity of patients or diagnostic materials must be preserved.

Results

This section must be explicit, concise and free from any form of ambiguity or unnecessary repetition. Tables and figures should be placed as much as possible, in proximity to the part of the text referring to them. Pictures must be of very good quality. All illustrative items must have an in-text reference, annotated and should contain clear descriptive legends.

Discussion

The results of the research should be discussed with particular attention to interpretation. A well-structured discussion will state the main findings, the strength and weakness of the study in comparison with similar studies, unanswered questions and future directions.

Conclusion

A brief summary of key findings, implications and future research

Acknowledgement

Significant contributors, if any, to the research who does not qualify as authors may be acknowledged.

Conflict of interest

The author(s) must issue a statement concerning conflict of interest in performing or reporting the research.

[Check here for Guideline on how to prepare Short Communication](#)

Referencing Style

The journal adopts the Vancouver referencing style recommended at the International Committee of Medical Journal Editors conference in Vancouver, 1978.

Text Citations

References numbers within the text should be in superscript at the end of a sentence, placed after the full stop. it should also be placed after a comma as the case may be. All et al should be in italics followed by either a full stop or a coma, as the case may be. The actual authors can also be referred to, but the reference number must always be given.

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-General Guide

The reference list comes at the end of your document. Number the references in the list in the order in which they appeared in the text. List the authors' names, starting with surnames, followed by a maximum of two initials. The initials should NOT be separated with a full stop or a comma. The authors' names should be separated with a comma and Full stop should follow the final name. Where there are more than six (6) authors the first 6 should be listed followed by 'et al. and a full stop.

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7. Denning PJ, Campbell RT, John HT. Computational thinking in science. Am Sci 2017;105(2):13-17.

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2017 ,.Feb 13]; 59: 446-455. Available from <http://www.sciencedirect.com/science/article/pii/S0747563216300930>

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Citation from unpublished work

5. Eke B. Evaluation of frequency of abdominal surgeries at Benue State University Teaching Hospital Makurdi Nigeria. Ph.D. Thesis, 2017, Benue State University Makurdi Nigeria. 253pp.

Cover Letter

Each submission should be accompanied by a cover letter in a Microsoft Word file. The content of the letter should include, a statement that:

1. The research is original and has not been submitted or accepted for publication elsewhere;
2. Potential conflict(s) of interest(s) do or do not exist;
3. The manuscript has been read and approved by all the authors.
4. E-mail addresses of all Co-Authors should be included.

Article submitted to the journal should not have been submitted for peer-review in another journal simultaneously, nor previously published.

A research report submitted simultaneously to two journals or submitted twice for publication will attract appropriate sanctions.

The manuscript should be formatted without section headings in the body of the text and contain no more than 3 figures or tables, combined.

Required Sections in Short Communication
Authors, affiliations and correspondence should be provided as in full research write up.

1. Title

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The abstract should be limited to 100 words or fewer.

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Preparation of original research manuscripts

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3. The manuscript has been read and approved by all the authors.
4. E-mail addresses of all Co-Authors should be included.

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The above mentioned Editorial team of IRJMPCH is vested with the responsibility as contained in the terms of reference to be served them. Please accept assurances of the Administrator highest regards.

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2. Reviewer of disciplinary specialties/courses membership (specify your interest... 1 or 2)

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PREVALENCE, TYPES AND PREDICTORS OF SEXUAL ABUSE AMONG IN-SCHOOL ADOLESCENTS IN AKWA IBOM STATE, NIGERIA: AN URBAN-RURAL QUANTITATIVE SURVEY

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ABSTRACT

Background: Sexual abuse among adolescents is a serious public health problem. This study aimed to determine and compare the urban and rural prevalences, types and predictors of sexual abuse amongst in-school adolescents in Akwa Ibom State, Nigeria.

Methodology: This was an analytical cross-sectional comparative study involving 740 public senior secondary students from 4 selected rural and urban schools. A self-administered, semi-structured questionnaire was used for data collection. Data analysis was carried out with Statistical Package for Social Sciences version 20 software. Logistic regression analysis was used to determine the predictors of unwanted sexual experiences and statistical significance was taken at p value ≤ 0.05 .

Results: The mean age of respondents was 17.0 ± 1.52 years for urban compared to 16.0 ± 1.19 years for rural respondents ($p < 0.001$). The overall prevalence of unwanted sexual experiences was 60.9%, with a significantly higher proportion from the rural (72.2%) compared to the urban schools (49.7%) ($p < 0.001$). Types of unwanted sexual experiences reported included verbal abuse, (35.9% rural, 34.3% urban), breast caressing (23.8% urban, 17.3% rural), kissing (20.5% rural, 19.8% urban), genital touching (18.1% urban, 16.2% rural), pornography (33.0% urban, 25.9% rural), intercourse (45.7% urban, 43.2% rural), unwilling intercourse (70.4% urban, 76.9% rural). Predictors of sexual abuse among rural respondents included monetary gain ($OR=4.00$; 95% CI: 2.549-6.275), peer pressure ($OR=2.666$; CI: 1.729-4.113) and curiosity ($OR 4.21$; CI: 2.682-6.635), while for urban respondents it included monetary gains ($OR=2.00$; 95% CI: 1.414-3.275) peer pressure ($OR=2.666$; CI: 1.414-3.275), curiosity ($OR 2.59$; CI: 1.695-3.962.) and alcohol intake ($OR 2.65$; CI: 1.741-4.044)

Conclusion: This study shows a high prevalence of sexual abuse among the respondents. There is need for reproductive health education in schools in order to mitigate this menace

Keywords: sexual abuse, unwanted sexual experiences, adolescent, peer pressure

Introduction

Adolescent sexual abuse is a topical issue of public health importance, a 21st-century reality that remains a cause for concern to parents, teachers, and governments of nations all over the world¹. The social, economic and health issues of adolescent students in rural and urban areas need

to be highlighted especially as most often they are a population commonly abused and rarely reported². Every day, countless children and adolescent students around the world are sexually molested, harassed, exploited and abused, to the extent that sexual abuse is increasingly being recognized as a major social and public health

concern globally³. Sexual abuse in an adolescent is sexual activity between an adolescent and a person who by age or development is in relationship of responsibility, trust or power, the activity being intended to gratify or satisfy the need of such a person. This act may include but is not limited to the inducement or coercion to engage in any unlawful sexual activity, the exploitative use in prostitution, pornographic performance and materials or other unlawful sexual practices⁴.

Factors such as societal decadence, moral decadence, poor parenting and upbringing, poor educational system, poor judiciary/ legal system have been shown to worsen the problem of sexual abuse among senior secondary school adolescent students⁵. Sexual abuse can cause many short and long term struggles for victims, offenders, families, communities and the larger society culminating into immediate psychological reactions like shock, shame, guilt, anger and long term complications such as depression, post-traumatic stress disorder, suicidal ideation, lack of sexual enjoyment and fear⁶. Adolescent students constitute the greater proportion of people with sexual abuse problems, thus they are considered a high risk group^{6,7}.

The WHO reported that 1 in every 5 women has been a victim of sexual assault and globally, 35% of women have experienced either physical and or sexual violence in childhood⁸. The Center for Disease Control and the United States Department of Justice in 2013 conducted a study and reported prevalence of high school boys and girls being forced to have sex at some point of time in their lives to be 11% and 4% respectively⁹. The types of sexual abuse among adolescent students could be penetrative or non-penetrative. The non-penetrative or non-contact form varies from adolescent pornography to all forms of sexual touch while the penetrative or contact include digital and /or object/ penile penetration of the vagina and / or anus as well as oral-genital, genital-genital, vaginal, anal or oral penetration^{9,10}. The penetrative sexual abuse typically results in straddle injury which is the most common type of unintentional injury involving the genitalia and arise when soft tissues of the external genitalia are compressed between the object and the pubic bone resulting in haematoma formation of the external structures with visible swelling and some pains in the anterior portion of the external genitalia.¹⁰

Young people face numerous health and sexual challenges during their transition to adulthood. These challenges include, among others, limited access to Sexual and Reproductive Health (SRH) information and services. Unmet SRH needs among secondary school adolescent students

may contribute to sexually transmitted diseases, including HIV, and unintended pregnancies, abortions and its attendant complications¹¹. Secondary school adolescent students are the most at risk group for sexual abuse and violence. The data on age of sexual initiation and rates and sexual abuse/ violence make it clear that more adolescent- specific research needs to be conducted to construct and drive- home an evidence base for planning and implementing adolescent- specific SRH programs in Nigeria¹². The vulnerability of this group is thought in part to be related to low socio-economic status and inexperience in matters of adolescent sexuality as reported in a study by Alokan¹³. Most adolescents in senior secondary schools in both rural and urban areas are immature on matters concerning sexuality thus, further worsening their vulnerability to sexual abuse¹⁴.

It is worth noting that adolescence is a combination of physical, psychological and social changes that manifest differently in different cultural settings, hence, their SRH needs including understanding the determinants of specific patterns of sexual behavior and practices, predictors should be highlighted. This study has therefore looked at the prevalence, types and predictors of sexual abuse among public senior secondary school adolescents in urban and rural areas of Akwa Ibom State, Nigeria.

Methodology

Study Setting

The study was carried out from October 2022 to January 2023 among 740 participants in 4 selected public senior secondary schools in Akwa Ibom state, Nigeria. The State is one of the 36 States in Nigeria, and it is situated in the oil-rich Niger Delta region. The geographical area of the State is divided into upland and riverine with thirty-one Local Government Areas (LGAs) categorized into three senatorial districts namely Uyo, Eket and Ikot Ekpene. These schools are located in the three senatorial districts of the state. Using population projection and estimations index of the State Bureau of Statistics, the state 2021 projected population was 6.4 million and estimate of adolescents population aged 10-19years was 928,914¹⁵.

Attractive tourist centers in the state include Le Meridien and Golf Resort, 30,000 seats sport complex (stadium), Ibom Tropicana and Entertainment center, Ibieno beach and a widespread of viewing centers, Eataries/Bars/Hotels and other Cinema centers where senior secondary school adolescent students may patronize. Nigerian secondary education is organized into two categories: Junior and Senior secondary schools each lasting for 3

years. Adolescents make up about 25% of the general population and a minimum of one out of 3 people in Akwa Ibom lives in some form of urban accommodation with access to an urbanized lifestyle¹⁶

Study Design

A cross sectional analytical comparative study was employed in this study to ascertain the prevalence, types and predictors of sexual abuse among adolescents in public senior secondary schools.

Study Population

The study population comprised of senior secondary school adolescent students (14-19 years) in selected urban and rural areas of Akwa Ibom State, Nigeria.

Sample Size Determinations

The sample size formular for comparing 2 proportions was used⁷ where

P_1 represents prevalence rate from a previous study on high risk sexual behavior among adolescent secondary school students in an urban setting = 69.9%⁸

P_2 = Prevalence rate from a previous study of sexual practices among upper grade public secondary school adolescents in rural setting = 59.6%²

The calculated size was 333 for urban group and 333 for rural group, giving a total of 666

Non-response of 10% was added to give 370
Hence, 370 in each group with a total of 740 for both groups

Sampling Technique

A multi-stage sampling technique was employed in this study.

In the first stage. The LGAs were stratified into rural and urban (seven out of the thirty one local government areas in Akwa Ibom State are classified as urban, the other twenty four are rural). The ratio of urban and rural LGAs was 1:3
One urban and 3 rural LGAs were selected using simple random sampling technique.

Second stage was the selection of schools. A list of approved public senior secondary schools was obtained from AKS Secondary Education Board. From the Urban LGA (Uyo LGA), one school was selected and one school each was selected from the 3 rural LGAs using the simple random sampling technique.

Third stage: Selection of respondents A total of 370 students in the urban and 124 students in each of the three rural schools selected were included in the study. Students for this study were recruited from SS1, SS2, SS3. Proportionate allocation was done to determine the number of students to select from each class in each urban and rural

public senior secondary schools. The desired number of students were subsequently selected from each class using simple random sampling technique.

Study Instruments

The study instrument was adapted from: United Nations Children Fund (UNICEF) questionnaire measuring violence against children¹⁸ and questionnaire on prevalence of sexual abuse among adolescents in Geneva¹⁹. The instrument was validated and pretested.

Data Collection

The data was collected for a period of three months during school session. The different schools were asked to give convenient days and free periods for data collection based on the school's weekly schedule. The self-administered questionnaires were administered to the selected students in their respective classes in each school. To ensure confidentiality and an atmosphere devoid of external influence, the principals and teachers were not present while the students completed the questionnaires. Also, the students were spaced so that they could not interact with one another while filling the questionnaire. The research team was made up of the first author and six research assistants who were resident doctors.

Statistical analyses

Data was fed into Statistical Package for the Social Sciences (SPSS) version 20 software to generate frequency tables and percentages. Chi-square test was used to test for significant association between variables that are nominal. The mean age of adolescent sexual abuse was assessed/measured by determining the number of times the respondents in their life time was sexually abused, the life time period was measured as a continuous variable and then recoded as a categorical variable having three categories: 10 – 14 years as early adolescence, 15–17 years as middle adolescence and 18–19 years as late adolescence. Adolescent age at first sexual intercourse was measured as a continuous variable and then recoded as a categorical variable having three categories of two-year intervals: ≤ 9 years, 10 – 12 years and 13 – 14 years. The logistic regression analysis was used to determine predictors of adolescent sexual abuse. The cut off for including variables into the logistic model was $p= 0.05$. The level of significance was set at $p\leq 0.05$ at 95% confidence interval.

Ethical considerations

Ethical approval was obtained from the Institutional Health, Research and Ethical Committee of the University of Uyo Teaching Hospital UUTH Uyo, with reference number UUTH/AD/S/96/VOL.XX1/610 and permission to carry out the study was obtained from the Ministry

of Education, State Secondary Education Board, Uyo Akwa Ibom State. The first author obtained permission from the Principals of the selected schools.

A notification letter was sent to the Parent-Teacher Association (PTA) of the selected schools and those participants less than 18 years gave assent while their parent/ guardian provided written consent. Written consent was obtained from those aged 18 years and above. The self-administered questionnaire was completed by the students after adequate explanation of the purpose of the study and the contents of the questionnaire. Privacy was ensured with spacing of the students while filling the questionnaire in the hall. Confidentiality was assured as the students were informed not to write their names on the questionnaire and all the personal identifying information such as phone numbers, address and name of respondents were not captured on the questionnaire nor electronically. Serial numbers and not names of participants were used to ensure confidentiality.

Results

The mean age of respondents from the urban public senior secondary school was 16.56 (± 1.52) years while that of the rural public senior secondary schools was 15.96 (± 1.19) years ($p<0.001$). A higher proportion of the respondents in rural schools were aged 14-15 years 193 (52.2%) compared to 110 (29.7%) in the urban schools. A higher proportion of the respondents in rural schools were females, 238 (64.3%) compared to

219(59.2%) in urban schools

The prevalence of the unwanted sex related experiences was 49.7% in urban compared with 72.2% in rural schools. ($P=0.001$).

The prevalence of sexual intercourse among the respondents in the urban schools was 45.7% compared with 43.2% in rural public senior secondary schools. A higher proportion of respondents in the rural schools 75 (46.9%) compared to 58 (34.3%) in the urban schools was ≤ 9 years age at first sex. ($p=0.058$). Out of the 169 respondents that had sexual intercourse in the urban schools, 119(70.4%) did not give consent and out of 160 respondents in rural schools that had sexual intercourse, 123(76.9%) did not give consent ($P=0.184$), the overall prevalence of sexual abuse was 60.9%. (**Table 2**)

The proportion of respondents with verbal sexual harassment was slightly higher in the rural schools, 133(35.9%), compared to the urban schools, 127 (34.3%) ($p= 0.644$). A higher proportion of respondents in the urban school, (23.8%), compared to rural public senior secondary schools, (17.3%), had breast caressed ($\chi^2=4.59$, $p=0.029$). The proportion of respondents who had genital touching was slightly higher in the urban school 18.1% compared to rural schools, 16.2%. A higher proportion of respondents who were forced to watch pornography were seen in the urban school, 122(33.0%) compared to 96(25.9%) rural schools (**Table 3**)

A higher proportion of respondents in urban

schools, 159(42.9%) reported smoking cigarette compared to 125 (33.8%) among respondents in rural schools ($p=0.010$). Out of the proportion that smoke cigarette, (20.0%) in rural compared to (18.8%) in urban schools often smoked cigarette ($p= 0.305$). Also, (34.9%) of respondents in urban schools had indulged in alcohol intake compared to (33.8%) in the rural schools. Out of the proportion that admitted to drinking alcohol, a higher proportion of respondents in rural public senior secondary schools, (20.0%) compared to (7.0%) from the urban public

Table 1 Socio-demographics characteristics of the respondents

Characteristics	Urban(%) n=370	Rural(%) n=370	Total n = 740	χ^2	p-value
Age group					
14-15	110 (29.7)	193 (52.2)	303(40.9)	40.63	<0.001*
16-17	149 (40.3)	114 (30.8)	263(35.6)		
18-19	111 (30.0)	63 (17.0)	174(23.5)		
Mean \pm SD	16.56 \pm 1.52	15.96 \pm 1.19	16.26 \pm 1.36		
Gender					
Male	151 (40.8)	132 (35.7)	283(38.2)	2.07	0.151
Female	219 (59.2)	238 (64.3)	457(61.8)		
Class grade					
SS1	109 (29.5)	184 (49.7)	293(39.6)	71.28	0.001*
SS2	186 (50.3)	177 (47.8)	363(49.1)		
SS3	75(20.2)	9 (2.5)	84(11.3)		

*Statistically significant ($p<0.05$)

Table 2: Prevalence of Sexual Abuse among the respondents

Variables	Urban(%) N= 370	Rural(%) N= 370	Total n = 740	χ^2	p-value
Unwanted sex related experiences					
Yes	184 (49.7)	267 (72.2)	451(60.9)	39.11	<0.001*
No	186 (50.3)	103 (27.8)	289(39.1)		
Ever had sexual Intercourse					
Yes	169 (45.7)	160 (43.2)	329(44.5)	0.44	0.554
No	201 (54.3)	210 (55.8)	411(55.5)		
	N=169	N=160	N=329		
Age at first Sex					
=9	58 (34.3)	75 (46.9)	133(40.4)	5.70	0.058
10—12	85 (50.3)	68 (42.5)	153(46.5)		
13—16	26 (15.4)	17 (10.6)	43(13.1)		
Willingly Consented					
Yes	50 (29.6)	37 (23.1)	87(26.4)	1.76	0.184
No	119 (70.4)	123 (76.9)	242(73.6)		

Table 3: Types of sexual abuse among the respondents

Variables	Urban N= 370	Rural N= 370	Total n = 740	χ^2	p-value
Types of sexual abuse					
Verbal Sexual harassment					
Yes	127 (34.3)	133 (35.9)	260(35.1)	0.21	0.644
No	243 (65.7)	237 (64.1)	480(64.9)		
Breast Caressed					
Yes	88 (23.8)	64 (17.3)	152(20.5)	4.77	0.029*
No	282 (76.2)	306 (82.7)	588(79.5)		
Unwelcomed Kissing					
Yes	72 (19.5)	77 (20.8)	149(20.1)	0.21	0.647
No	298 (80.5)	293 (79.2)	591(79.9)		
Genital Touching					
Yes	67 (18.1)	60 (16.2)	127(17.2)	0.47	0.495
No	303 (81.9)	310 (83.8)	613(82.8)		
Forced to watch Pornography					
Yes	122 (33.0)	96 (25.9)	218(29.5)	4.39	0.036*
No	248 (67.0)	274 (74.1)	522(70.5)		
No	250 (79.5)	276 (78.9)	526(71.1)		

senior secondary schools often drank alcohol. The difference was statistically significant ($\chi^2=12.32$, $p=0.002$) (**Table 4**)

A higher proportion of respondents in urban public senior secondary school, 60 (35.5%) compared to 40(25.0%) from the rural public senior secondary schools agreed that monetary gain was one of the reasons for having sexual intercourse ($\chi^2=4.29$, $p=0.038$). Also the proportion of respondents who peer pressure was a reason for having sexual intercourse was slightly higher in the urban public senior secondary schools, 60 (35.5%), compared to the rural public senior secondary school, 48 (30.0%). Furthermore, a higher proportion of respondents in urban, 33.1% compared to 24.4% from the rural public senior secondary schools agreed that curiosity was a reason for having sexual intercourse. The proportion of respondents for whom poverty was the reason for having sexual intercourse was slightly higher in the urban public senior secondary school, 66 (39.1%) compared to 55(34.4%) from the rural public senior secondary schools ($p=1.640$) (**Fig 1**)

Respondents in urban school who were aged 18-19 years were 2.5 times more likely to have experienced some forms of sexual abuse compared to those aged 14-15 years ($OR=2.514$; 95% CI:0.784-8.058). Respondents who had sexual knowledge had 40% reduced likelihood of experiencing sexual abuse compared to those without sexual knowledge ($p=0.017$) ($OR=0.606$; 95% CI: 0.401-0.915). Respondents who had friends that also had sex were 1.7 more likely to have experienced some forms of sexual abuse ($p=0.008$) compared to those who did not ($OR=1.779$; 95% CI: 1.162-2.726). Alcohol intake significantly ($p=0.0001$) increased the

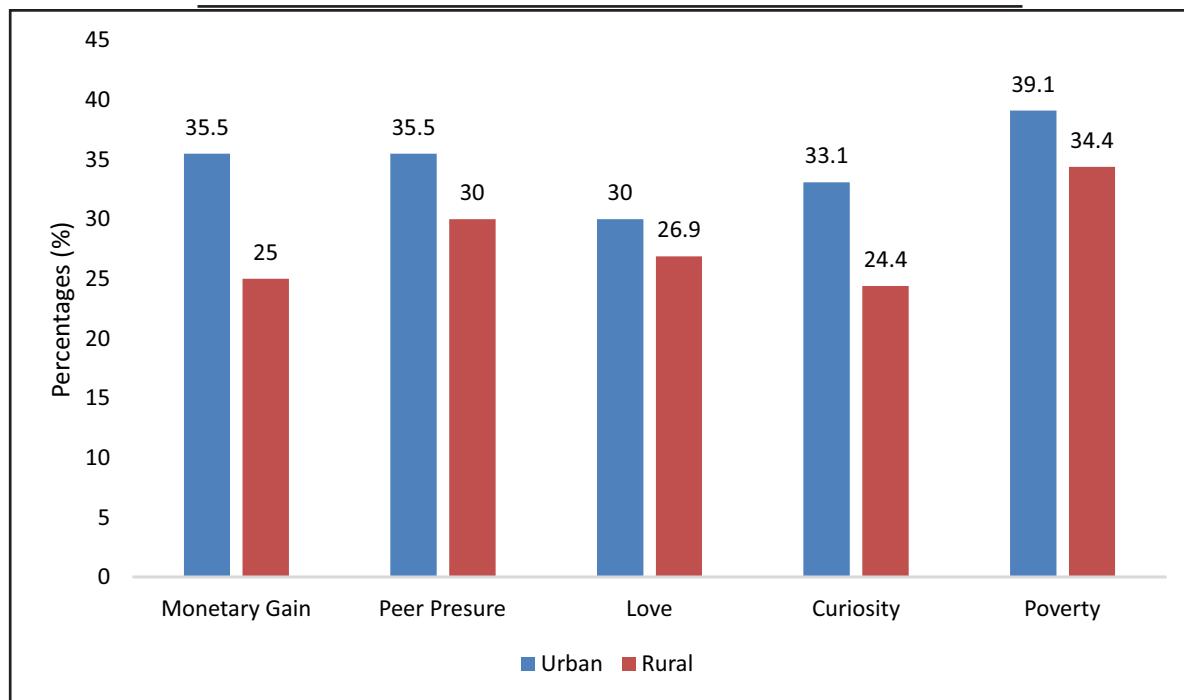


Fig 1 reasons for indulging in sexual intercourse among the respondents

likelihood of being sexually abused by 2.653 (95% CI: 1.741-4.044). Also, respondents who smoke cigarette were 1.65 times more likely to have been sexually abused ($p=0.016$) compared to non-smokers ($OR=1.651$; 95% CI: 1.093-2.493). Curiosity among respondents was associated with higher likelihood of experiencing some forms of sexual

abuse by 2.591 times compared to respondents that were not (95% CI: 1.695-3.962) ($p<0.0001$). Respondents who had sex for monetary gain and peer pressure influence had 2.152 likelihood of experiencing some form of sexual abuse compared to those who were not ($OR=2.152$; 95% CI: 1.414-3.275) ($p=0.0003$) respectively (**Table 5**)

Table 4: Social habits among the respondents

Variable	Urban(%) N= 370	Rural(%) N=370	Total n = 740	χ^2	p-value
Do you smoke cigarette?	159 (42.9)	125 (33.8)	284(38.4)	6.60	0.010*
	N=159	N=125	N=284		
How often do you smoke					
Rarely	97 (61.0)	66 (52.8)	163(57.4)	2.37	0.305
Occasionally	32 (20.1)	34 (27.2)	66(23.2)		
Often	30 (18.8)	25 (20.0)	55(19.4)		
Alcohol intake	129 (34.9)	125 (33.8)	254(34.3)	0.09	0.757
How often do you drink alcohol	N=129	N=125	N=254		
Rarely	92 (71.3)	66 (52.8)	158(62.2)	12.32	0.002*
Occasionally	28 (21.7)	34 (27.2)	62(24.4)		
Often	9 (7.0)	25 (20.0)	34(13.4)		

Table 6 depicts predictors of sexual abuse among rural school respondents. Respondent for whom poverty was the reason for engaging in sexual intercourse were 1.640 times more likely to have experienced some form of sexual abuse ($p= 0.019$) compared to those for whom poverty was not ($OR=1.640$; 95% CI: 1.083-2.483). There was a 2.0 likelihood of experiencing sexual abuse among respondents with unwelcomed kissing compared to those who were not ($OR=1.919$; 95% CI: 1.211-3.044) ($p=0.005$).

Respondents who had sex for monetary gain had 4.00 times likelihood of experiencing some form of sexual abuse compared to

Table 5: Predictors of sexual abuse experiences among respondents in urban public senior secondary schools

Variables	Category	p-value	Odd Ratio	95% CI Lower-upper
Close friend who also had sex	Yes	.008	1.779	1.162-2.726
	No I			
Social habits	Smoking	0.016	1.651	1.093-2.493
	No smoking I			
	Alcohol	0.0001	2.653	1.741-4.044
	No alcohol I intake			
Genital touching	Yes	0.049	1.540	1.000—2.378
	No I			
Unwelcomed kissing	Yes	0.001	2.014	1.314-3.088
	No I			
Curiosity	Yes	<0.0001	2.591	1.695-3.962
	No I			
Monetary gain	Yes	0.0003	2.152	1.414-3.275
	No I			
Peer pressure	Yes	0.0003	2.152	1.414-3.275
	No I			
Sexual knowledge	Yes	0.017	0.606	0.401-0.915
	No I			
No of sexual partners	Multiple I			
	Single	0.001	0.377	0.247--0.575
Poverty	Yes	0.019	1.640	1.083-2.483
	No I			
Breast caressing	Yes	0.006	1.830	1.186-2.827
	No I			
Constant		0.007	13.927	

Generally, rural lifestyles, poor exposure and sexual ignorance stimulate higher stress levels in the daily lives of parents/guardians in the rural population making them to have less time to monitor their children. This may be responsible for the unwanted sexual experiences and the higher prevalence rate recorded in rural schools compared to urban schools. The occurrence of sexual abuse in rural and urban schools is a pointer to the need to pay adequate attention to protection of the sexual rights of all adolescents at all times.

Previous studies in Nigeria showed that the prevalence of adolescent sexual abuse ranged from 2.1% to 77.7% ^{23, 24}. The prevalence of adolescent sexual abuse in other parts of Africa varied between 16% in Cameroun, 23% in Sierra Leone, 34.4% in Ethiopia, 49% in Ghana to 65.6% in Zimbabwe, and 67% in

those who did not (OR=4.00; 95% CI: 2.549-6.275) (p=0.001). Respondents with peer pressure influence were 2.66 times more likely to have experienced some form of sexual abuse compared to those who were not (OR=2.66; CI:1.729-4.113) (p=0.0001).

Discussion

This study determined and compared the prevalences, types and predictors of sexual abuse amongst adolescents in selected schools of the urban and rural areas of Akwa Ibom State.

The study noted that the prevalence of unwanted sex related experiences among respondents from rural schools was significantly higher 72.2% compared to 49.7% in urban schools.

This could be due to shifts in values and practices, cultural practices and socio-economic hardships, the desire to live an affluent lifestyle, poor religiosity, poor exposure to modern development, decay morale and poor parental upbringing. Other predisposing factors in rural schools could be cramped living conditions in the rural area, large number of household members which limits privacy, as parents are often forced to share sleeping space with children, thus exposing children to sexual activity early in life²². Furthermore, exposure to parental sexual activity may weaken adult control over their children's sexual behaviour. Background poverty may also force young people to move out of parental homes to their dwellings prematurely, providing them with opportunities to engage in risky behaviour away from parental supervision.

Table 6: Predictors of sexual abuse experiences among respondents in rural public senior secondary schools

Variables	Category	p-value	Odd Ratio	95%CI Lower-upper
Unwelcomed kissing	Yes	0.005	1.919	1.211-3.044
	No †	1.000		
Curiosity	Yes	0.0001	4.218	2.682-6.635
	No †			
Monetary gain	Yes	0.001	4.000	2.549-6.275
	No †			
Peer pressure	Yes	0.0001	2.666	1.729-4.113
	No †			
Poverty	Yes	0.003	1.909	1.249-2.917
	No †			
Breast caressing	Yes	<0.001	2.550	1.594-4.081
	No †			
Constant		0.007	13.927	

Different types of sexual abuses were reported in the present study. Verbal sexual harassment was little above one-third in urban and rural schools. The urban-rural similarity was not surprising due to the increasing interest shown by peers, lack of skills when it comes to expressing sexual interest in both settings. Similarity in pubertal development among adolescents in both settings could also be a factor for the verbal sexual harassment in both settings. The prevalence of verbal sexual harassment noted in this study was similar to the Ijesha study conducted in urban schools where little above one-third of respondents had experienced verbal sexual harassment³¹.

Breast caressing was higher among respondents in urban schools compared to those in rural schools. Little above one-fourth of urban schools respondents had experienced breast caressing compared to less than one-fifth of respondents in the rural schools. The finding recorded in this study contradicts with the North Eastern Nigerian study, where about 9% of the respondents reported breast caressing³². The socio-cultural and religious

factors in the North East Nigeria may have been responsible for this finding. Early marriages, religion, dressing style and cultural considerations where female adolescents live separate from the male counterparts may account for low prevalence of breast caressing.

Genital touching was higher among urban schools respondents 18.1% compared to 16.2% in rural schools. The difference in proportions was not statistically significant. This study finding was similar to the result of finding in a study at Enugu metropolis where a little less than one-fifth of respondents had experienced genital touching³³. In the present study, about one-third of urban school respondents who watched pornographic pictures/videos had unwanted sexual experiences compared with one-fourth of those in the rural schools. This finding was also similar with the finding in a study at South East Nigeria where about one-third of respondents in urban schools had watched pornographic pictures³³. This could be due to the availability of modern infrastructure, desire to live affluent lifestyle, influx of cinema/ viewing centers,

Botswana²⁵⁻²⁸. The prevalence of sexual abuse in the present study also falls within this range.

However, lower prevalence rates were found in studies where parents had to give information about sexual abuse of their adolescents as seen in studies conducted in south western Nigeria with prevalence of 2.1% and 2.7% respectively^{29,30}. This low prevalence could have been due to withheld information by parents or because affected adolescents did not disclose their experiences to their parents.

Lower prevalence rates have also been reported in Europe (9.2%), America (10.1%) and Asia (23.9%) probably due to the high socioeconomic status and social support, good legal system, good educational system enjoyed by their citizens³⁰.

eateries and westernization. More than one-fourth of respondents in rural schools who masturbated had unwanted sexual experiences compared with less than one-fourth in urban schools. Pornography and masturbation could initiate sexual arousal and could make the adolescents more vulnerable and easy targets of sexual abuse. This finding was similar to urban study in Enugu³⁴ that had one-fourth of respondent with masturbating activity.

Respondents who were forced to watch pornographic pictures/ videos were about 33% in urban schools compared to about 25% in rural schools. This finding was similar to the result of an urban study at South East Nigeria where 36% of respondents had watched pornographic pictures^{3,34}. This finding also agreed with a study conducted in Enugu Nigeria. The adolescents are probably exposed to pornography to arouse them so they easily yield to intercourse.

Concerning the predictors of unwanted sexual abuse factors associated with unwanted sexual experience among respondents in urban and rural schools, about 42.9% of respondents in urban schools had smoked cigarette compared to 33.8% of respondents in rural schools. Also, 34.9% of respondents in urban schools had indulged in alcohol intake compared to 33.8% in the rural schools. This difference in proportion was statistically significant. This finding was similar to finding in rural schools in Southern Nigeria, where about 34% of respondents were implicated in alcohol, smoking and sexual abuse³⁵. A possible reason could be that adolescents in this study area attend lots of social gatherings such as birthday parties, funeral ceremonies and marriage ceremonies where, in such occasions alcohol drinks are usually available in reasonable quantity such that adolescent have free access to them.³⁵ The finding about smoking recorded in this study is lower than that in the South Eastern Nigerian study, where 66.6% of the respondents had indulged in smoking.³⁶

Alcohol intake and smoking of cigarette were the key factors that could influence their behavior toward indulging in unwanted sexual experiences. A study has shown that adolescents are naturally less in control of their emotions and alcohol use may worsen the situation by reducing their ability to make rational decisions. Hence alcohol and smoking of cigarette increase adolescent's risk-taking behaviours especially with regard to their sexuality and sexual abuse.³⁶ Adolescents are typically experimenters. They experiment with lots of human behaviors including smoking and sex.³⁷ Availability of alcohol, retailing of sticks of cigarette and use of alcohol as beverages in social occasions/ gatherings are common factors that enhance sexual abuse³⁷. Consuming alcohol or drugs by adolescent makes it difficult for them to

protect themselves by interpreting and effectively acting on warning signs of sexual abuse displayed in some secondary schools. This increases their vulnerability to sexual violence. It may also place adolescent girls in settings where chances of encountering a potential offender are greater.^{31,37} Alcohol and smoking are capable of changing individual's perception influencing their behavior including having unwanted sexual experiences. Regrettably alcohol and smoking have lifelong consequences in adolescents; some of which arise from such anti-social behaviours often associated with alcohol and smoking as sexual abuse and rape. There is, therefore serious need to embark on intervention strategies to prevent alcohol-smoking and sexual abuse syndrome among adolescents. Concerning predictors of unwanted sexual abuse among respondents in the urban schools, alcohol intake significantly increased the likelihood of being sexually abused by almost thrice. Also, respondents who smoked cigarette were about twice more likely to have been sexually abused compared to non-smokers. Cigarette smoking and alcohol intake increases vulnerability which could lead to unwanted sexual experiences.

Curiosity among urban schools respondents was associated with higher likelihood of experiencing some forms of sexual abuse by about three times compared to respondents that were not and 4.2 times likelihood among rural respondents compared to respondents that were not. This could imply that adolescent experiment a lot and are curious of doing anything, including desiring to know what it feels like to have sex. Respondents who had sex for money and peer pressure influence in urban settings had a 2 times more likelihood of experiencing some form of sexual abuse compared to those who were not, respectively. Respondents in rural schools who had sex for monetary gain had 4 times more likelihood of experiencing sexual abuse compared to those who did not. This could have been linked to poverty and adolescent trading on the street to pay school fees. The poor socio-economic status of the family could have been a contributing factor.

Respondents with peer pressure influence in rural were about thrice more likely to have experienced some form of sexual abuse than those without. Peer pressure influence is a strong force that drives unwanted sexual experiences among the adolescent. This finding differs from a study conducted in villages in Ghana, where 70% of mothers said they had encouraged young girls and secondary school leavers into premarital sexual relationships and sex for money.³⁸ many older women felt that receiving gifts in exchange for sex was not regarded as prostitution but evidence of a man's love.³⁹ This opinion may also be shared by the adolescent girls. Respondents in

urban who poverty was the reason for engaging in sexual intercourse were about twice more likely to have experienced some form of sexual abuse compared to those who poverty was not and 1.6 times more likelihood in the rural schools. This could have been due to poor socio-economic status, causing the adolescent to be enticed into illicit activities with the hope of financial compensation.^{36,40} Poverty may have made them more vulnerable, thus exposing them to different sexual advances with promises of financial compensations.⁴⁰ Respondents who engaged in breast caressing in urban schools had about twice the likelihood of being sexually abused compared to those who did not.

Respondents who engaged in breast caressing in urban schools were almost twice more likely to be sexually abused compared to those who were not and 2.5 times more likelihood in the rural schools compared to those who did not engaged in breast caressing. Also in the rural schools, there was 2 times likelihood of experiencing sexual abuse among respondents with unwelcomed kissing compared to those who were not. Breast caressing and unwelcomed kissing may both lead to sexual arousal which may make the parties concerned to proceed to unplanned sexual intercourse. It is therefore very important for adolescents to avoid situations that can increase their risks of sexual abuse while in school.

Conclusion

There was a high prevalence of sexual abuse among the respondents; with rural respondents having a significantly higher proportion of sexual abuse compared to the urban. The types of sexual abuse noted was more contact non-penetrative sexual abuse in rural schools compared to contact penetrative sexual abuse in the urban schools. Adolescents should be vigilant, seek sexual information. There is need for reproductive health education in schools in order to mitigate this menace

Limitations of study

The result of this study is generalizable among the public senior secondary school students in the State. Further studies are needed to unravel the findings in private, special, vocational schools in the state. The issue of self-reporting which was subjective was a limitation since the conclusions that were drawn from the study depended solely on the information given by the respondents. It was hoped that anonymity encouraged truthful and vivid answers from the respondents and the findings gave the true picture of the prevalence, types and predictors of sexual abuse among in-school adolescents.

The possibility of under-reporting was a limitation also as some respondents had a problem of

recalling the sexual abuse they ever had, the timing, the year and the duration of the acts. The abuses were perceived as a taboo especially in the environment culminating in social desirability bias as the respondents were reluctant to be fully honest about their actual experiences and the unwillingness to give correct information may underestimate the magnitude of the problem.

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Declarations:

The authors declare no competing interest.

References

1. Udooh SB, Idung AU. Sexual practices, knowledge and prevention of sexually transmitted diseases among upper grade secondary school adolescent students in Uyo. IOSR J of Dental and Medical scs. 2015;14(4):9-12 . A v a i l a b l e form:<https://doi.org/10.001145/ugsa-03>.accessed 15th May, 2021
2. Tobin EA, Okojie HO. Knowledge, attitude and practice of adolescent secondary school students in Uvwie Delta state, Nigeria. J of postgraduate medicine. 2010;12(1):45-49
3. Lalor K. Child sexual abuse in sub-Saharan Africa, Child Abuse Negl,2014;6(4):439-460 . A v a i l a b l e a t : <https://doi.org/10.1016/j.chab.2013.07.005>
4. National Adolescent Health Policy Department of Primary Health Care and Disease Control. Federal Ministry of Health. 2015 (Revised) Available from: <https://www.k4health.org/>accessed 5th October, 2021

5. Johnson O, Bassey B. Sexual practices among senior secondary students in private secondary schools in Uyo, Southern Nigeria. *Afr J Reprod Health.* 2019;23(4):46-53. Available from:<https://doi.org/10.29063/ajrh2019/v23i4.6>.accessed 23rd April, 2021
6. Odeigah L, Sule AG. High risk sexual behavior among adolescent secondary school students in Nigeria. *Afri Health Sc.* 2019;19(1):1466-1477. Available from:<https://dx.doi.org/10.4314/ahs.v19i1.20>. accessed 8th February, 2022
7. Pereda N, Guilera G, Forns M, Gómez-Benito J. The prevalence of child sexual abuse in community and student samples: a meta-analysis. *Clin Psychol Rev.* 2019;29(4):328. Available at: <https://doi.org/10.1016/j.cpr.2019.02.007>
8. World Health Organization (WHO). Maternal, newborn, child and adolescent health. Geneva, Switzerland: 2020. Available from: www.who.int/maternal-child/adolescent/topics/adolescence/devt/en. accessed 19th of October, 2021
9. World Health Organization (WHO)/CDC. Global and regional estimates of violence against women: prevalence and health effects of intimate partner violence and non-partner sexual violence: World Health Organization/US Department of justice; 2013
10. Stoltenborgh M. A global perspective on child abuse: meta-analysis of prevalence around the world.USA, Child maltreatment. 2011;16(2):79-101
11. Wondie Y. The psychosocial consequences of child abuse in Ethiopia: a case control comparative analysis "J of interpernal violenc 2011;2(1):243-247
12. WHO: The long term effect of childhood sexual abuse: Counseling Implications Available from: <https://www.whoint.counsellingoutfitters.com/vistas/vistas11/article-19> accessed 8th May, 2021
13. Alokan F. Child sexual abuse. A potential damage to children. *J EducSoc Res.* 2012;2(1):357-363. Accessed 4th May, 2021
14. Akhiwu W, Umanah IN. Sexual assault in Benin City, Nigeria.TAF Preventive Medicine Bulletin. 2013;12(4):377-382
15. Okonkwo O, Naish ME. Criminal laws of sexual abuse in Nigeria. Ibadan spectrum publisher 2013
16. UN General Assembly. Convention on the Rights of the Child, 20 November 1989, United Nations, Treaty Series, 1999;1577:3-5 Available at : <https://www.uncoc.org/doits/childabuse>. accessed 4th May, 2021
17. Akwalbom State Ministry of Justice- violence against persons prohibition law ,2020(Internet). Available from : <https://www.aksj/vappl/org>. accessed 20th of May, 2021
18. UNICEF. Statistical table, state of the world children 2011. Available from: www.unicef.org.accessed 7th May, 2021
19. Hamed F, Aboul S. Prevalence and pattern of child sexual abuse reported by cross sectional study among the university students, Egypt. *Egyptian Jof Forensic Sc.* 2012;2(3):89-96
20. Human Right Watch. World report 2018: our annual review of human rights around the globe . Retrieved from : <https://www.org/worldreport2018>.accessed 4th May, 2021
21. Mason Jones AJ. Intimate partner violence in early adolescence: the role of gender, socio-economic factors and the school. *The South Afric journal of med.* 2016;16(1):502-509 . Available from:doi:10.7196/SAMJ.2016.V106i5.9770.accessed 16th June, 2021
22. Naidoo S, Sartorius B. Prevalence and risk factors associated with Forced seaming south African high school students. *J community Health* 2017;2(5):1035-1043. Available from:<https://doi.org/10.1023/prf/2.2>. accessed 16th June, 2021
23. Childhood sexual abuse- counseling services. Obtainable from www.allaboutcounselling.com/sexual-abuse.htm.accessed 16 May, 20021
24. Negriff S, Smith C. Characterising the sexual abuse experiences of young adolescents. *Journal of child abuse Neglect.* 2014;38(2):261-267
25. Ntounas P. Female perpetrators of sexual abuse of minors: what are the consequences for the victims . *Int'l j l aw psychiatry.*2012;3(4):305-307. Available from:doi:10.1016/j.ijlp.2012.04.003.accessed 16th July, 2021
26. Seme A. Premarital sexual practices and its predictors among in-school adolescents of Shendi town, western Ethiopia. *Reprod Health J,* 2014;11(1):49 -52 . Available from:doi:10.1123-4644-054.accessed 15th May, 2021
27. Swahn H, Kasirye R. Girls and young women living in the slum: prevalence and correlates physical and sexual violence victimization, Ghana. *SAGE Open.*2015;15(2):21. Available from:doi:10.58244015580853.accessed 16th June, 2021
28. Ali A. Risky sexual behavior and factors associated with it among public secondary school students in Zimbabwe: a cross sectional comparative study. *Journal of Reprod Med* 2017 ; 1 (1) : 1 - 6 . Available from:doi:10.58244015533. accessed 14th July, 2021
29. Shashirkumar R, Srivastava K. A cross sectional study of factors associated with adolescents sexual activity. *Indian J Psychiatry.*

- 2012;54(2):138-142. Accessed 14th June, 2021
30. Omotade PG, Omolola FF. Risky sexual practices of senior secondary school students in an urban community of Oyo state, Nigeria. *International J Community Hlth Educ* 2017;4(1):173-180. Available from: doi:10.1177/0272684x17736154accessed 16th September, 2021
31. Tran NK, Berkel SR. Child and family factors with child maltreatment in Vietnam. *Journal Interpersonal violence*.2018.Available from: <https://doi.org/10.1177/0886260518767914>, accessed 6th May, 2021
32. Ashimi AO, Amole TG. Reported sexual violence among women and children seen at Gynecology emergency unit of a rural health facility in northern Nigeria. *Ann Med Health Sc.Reso*.2015;5(1):26-29
33. Nwokocha A, Ibe BC. Social factors predisposing Nigerian adolescents in Enugu to STI. *world J life Sc and medical Research* 2012;2(5):186-196
34. Folayan MO, Abigail H. Differences in sexual behavior and sexual practices of adolescents in Nigeria based on sex and self-reported HIV status. *Reproductive Health*. 2014;1(1):56-64
35. Fang X, Dunne M The burden of child maltreatment in the East Asia and pacific region. *Child abuse and neglect*.Available from:<https://doi.org/10.1016/J.chabu.2015.02.012> accessed 4th September, 2021
36. Bugaje M, Faruk J. Child sexual abuse in Zaria, Northwestern Nigeria. *Nigeria Journal of Paediatrics*. 2012;39(3):110-114. Available from:<https://doi.org/10.4314/njp.v39i3.4> accessed 4th May, 2021
37. Adigeb P, Mbua A. Child abuse and student academic performance in Boki LGA of Cross Rivers state, Nigeria. *British Journal education* 2015;3(3):34-42. Accessed 14th May, 2021
38. UNFPA. Global protection cluster. GBV assessment and situational analysis tool A v a i l a b l e from:www.unfpa.org/sites/default/files/public-violence. Accessed May 6th, 2021
39. Evelyn Nwagu. Health promotion international. *J on alcohol and drug usage among adolescents sexual behavior in Nigeria* 2015;18(1):75-78. Available from doi:10.1093/heapro/dav001.accessed 19th February, 2023
40. Haris JA.On the calculation of Intraclass and Interclass coefficient of correlation from class coefficient when the number is large. Available from doi:10.1039/biomet/9.3-4.446

THE IMPACT OF SIMULATION ON SIMULATED PATIENTS AMONG MEDICAL STUDENTS OF AMBROSE ALLI UNIVERSITY, EKPOMA SOUTH-SOUTH NIGERIA

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Abstract.

Background: To supplement or replace real life experience with guided experiences, simulation-based education is a training or instructional strategy. It provides an opportunity for students to learn by doing and reflecting on their experience. This study assessed the impact of simulation on simulated patients among medical students. The findings of this study can also be used to understand people's attitudes, emotions, concerns, and behaviors about simulation in healthcare settings. A focus group discussion with a purposive sampling technique was used to select seven participants with prior experience in simulation. A single Focused Group discussion (FGD) which lasted for 50mins was conducted and information gathered from the recordings was manually transcribed. The Majority of the participants had good knowledge about simulation and what it means to act as a simulated patient. Acting as a simulated patient increases confidence and composure. Most of the participants recounted the negative impacts of simulation in terms of the somatization of symptoms from the patients they mimic. The simulation process was also seen as a difficult, time-consuming, physical, and mentally exhausting activity. While a minority of the group has however benefitted from simulation as a stool of enhancing their academic reliability and help alleay their fears of clinical medical exams.

Conclusions. The impact of simulation on simulated patients can be both positive and negative. The positive impact includes good knowledge about simulation and enhancing their academic reliability and help alleay their fears of clinical exams. While the negative impact of simulation process was seen as difficult, time consuming, physical, and mentally exhausting activity.

Keywords: Simulated Patients, Medical Students, Focus group discussion

Background

The value of simulation-based education (SBE) is important in healthcare as well as in academics.¹⁻³ There is a clear recognition by academics and health professionals of the need for SBE, where students learn by doing and reflecting on their experience. Recent research has drawn attention to the role of simulated patients (SPs), asserting their effectiveness in creating realistic clinical experiences^{2,4-6}.

Simulated patients, sometimes referred to as standardized patients, have been utilized extensively in pre-registration training for the past 20 years⁷. A person who has been trained to play a patient or, in some situations, a patient relative is

known as a simulated patient (SP). SPs may also be referred to as role players, clinical teaching associates, trained patients, patient instructors, volunteer patients, hybrid patients, actor patients, and confederates⁸. By using the conventional mannequins, clinical students have run into a variety of problems. According to one study, using such models instead of the more conventional simulation-based training with mannequins dramatically improved students' clinical competency⁹.

Using conventional mannequins has presented many challenges for clinical students. According to one study, these models are much more efficient than conventional simulation-based

training with mannequins at enhancing students' clinical competence⁹. Throughout the past 50 years, SPs have been introduced in the field of healthcare education¹⁰ to get around these restrictions and move towards a more self-directed and interactive learning environment. The advantages for those playing SP roles include better relationships with their health care providers (HCPs), improved health knowledge and attitudes, and changes in health behavior. Some minor disadvantages for those playing SP roles include anxiety, exhaustion/fatigue, and physical discomfort right after a simulation¹¹.

According to studies by Joseph Plasklin et al.⁹, who concluded that there are significant limitations in the current literature and that additional studies are required to characterize the experiences of SPs more accurately during their study titled "The Benefits and Risks of Being a Standardized Patient," the evidence demonstrating the impact of simulation on simulated patients is underemphasized by many researchers. Because Standardized Patients (SPs) could verbalize responses, it was discovered during one of the researchers' clinical postings that using SPs improved students' clinical competence more than using mannequins in traditional simulation-based training. This finding is consistent with the work of Friederichs H, Weissenstein A, Ligges S, et al.¹¹ in their study Combining Simulated Patients and Simulators. Considering the aforementioned, the study aims to evaluate. To assess the impact of simulation on simulated patients among medical students (clinical) of Ambrose Alli University, Ekpoma, Edo State.

It is impossible to overstate the significance of this study because the results would significantly advance our understanding of the effects of simulation on standardized patients and advance clinical education in Nigeria and at Ambrose Alli University in Ekpoma, Edo State.

For further studies in clinical education, the results from this study will serve as a baseline. So, we can state that the findings of this study will have an overall impact on patients, both positively and negatively. A cross-sectional study carried out by Mangalore and his colleagues, on 247 participants in a private medical college in 2013 to demonstrate the knowledge and perception of Simulation-Based-Learning using a convenient sampling method. The results show that most of the participants (90.7%) had good knowledge about Simulated-Based-Learning. Most participants 72.5% had favorable perceptions of Simulated-Based-Learning (SBL). The majority of Students had good knowledge and a favorable perception of simulation-based learning.¹² Another cross-sectional study conducted at the College of Medicine, Jouf University, Sakaka, Saudi Arabia, in

2018, and comprised medical students of either gender in preclinical and clinical years who were exposed to simulation-based learning. A reliable questionnaire was used to collect data, and it was scored on a 5-point Likert scale (1=very dissatisfied; 5=very satisfied). Majority 78% of respondents (86%) had good knowledge of simulation-based learning and were satisfied with simulation-based learning¹³. In 2016, Plaksin J and his colleagues at New York University conducted a systematic review of the Benefits and Risks of being a Standardized Patient. The results show that students that presented themselves as simulated patients have improved health knowledge and show good attitudes with their healthcare providers and changed health behaviors.¹⁴

An explanatory sequential mixed-method design was carried out with undergraduate and recently graduated students from the College of Pharmacy at Qatar University (QU-CPH). This study highlighted the significance of simulation involving simulated patients. The findings revealed that over 90% of respondents believed that interacting with simulated patients is crucial for developing effective counseling and communication skills during professional skills course activities.¹⁵

A systematic review was done using Children and Adolescents as simulated patients in health professional education. The results suggest that the involvement of children and adolescents in simulation for education and assessment purposes can lead to potential harm in children/adolescents. This harm results from their underdeveloped psychological and psychosocial defense mechanisms. Adolescent SPs involved in risk-taking, sexuality, or mental-health scenarios acknowledge a transient negative or discomfort reaction. However, there is no evidence to support the presence of long-term adverse effects.

Materials And Methods

The study was conducted among Ambrose Alli University, Ekpoma medical students. Ambrose Alli University is a state-owned university located in Ekpoma. Ekpoma is a town in Edo State, and it lies at geographical coordinates of latitude 6°44' 34.80" N and longitude of 6°08' 25.04" E. It is the administrative headquarters of Esan West Local Government Area, which is one of the 18 local government areas in Edo state. It has a population of over 290,000 people. It is politically divided into 10 wards and occupies a land mass of 502 km² (194 sq mi). The study population consists of undergraduate clinical students at the University. The study was carried out within four weeks after obtaining ethical approval from the Health Research and Ethics Committee in ISTH. All consenting students of Ambrose Alli University (400L and 500L) who have acted as a simulated patient in the undergraduate medical examinations.

Among those who acted as simulated patients but declined consent were excluded from the study. A qualitative study (focus group discussion) was used to interview the participants. Here participants are free to talk with other group members. The focus group discussion lasted about 60 to 90 minutes. A purposive sampling technique was used in selecting the participants for the study and it was based on the experience of the participants as simulators in simulated scenarios in the past. The sample size is seven consisting of five males and two female participants.

The group interview was conducted and recorded in a quiet, neutral location of the participants' choice, where the participants were comfortable and not in any form of discomfort. There was no intimidation or coercion in the process of the

interview. The neutral location had only the interviewer and the moderator (researcher) in attendance.

On-site interview was the main source of data collection, and it was conducted on a day agreed with the discussants. It was based on questions listed in the interview guide. The discussion was time-bound. They responded to the questions asked by the moderator. Participants were allowed the freedom to talk about their experiences with simulations in ways that they were comfortable. The participant's responses were recorded in a recording tape and were eventually transcribed and coded manually from the recordings to a handwritten report. The interview lasted about 90 minutes. Field notes were made on some of the participants after the focus group discussion.

RESULTS. Table 1: Socio-Demographic Characteristics of Respondents.

Participants	Age (years)	Gender	Marital status	Occupation	Level of education	Religion
1	28	Male	Single	Student	Tertiary	Christian
2	25	Male	Single	Student	Tertiary	Christian
3	26	Male	Single	Student	Tertiary	Christian
4	30	Female	Single	Student	Tertiary	Christian
5	32	Male	Married	Student	Tertiary	Christian
6	24	Male	Single	Student	Tertiary	Christian
7	25	Female	Single	Student	Tertiary	Christian

Knowledge of Simulation.	
What do you know about simulation?	The majority of the participants (66.7%) believed that a simulation is an act where a person acts as a patient to mimic a real-life doctor-patient interaction to learn for medical students",
	About 33% of the participants believed that simulation as a teaching method stirs the participant's knowledge and skill level by putting them in a scenario where they must actively solve problems.
Impacts Of Simulation	
How many times have you participated in SP?	Two-thirds of the participants (66.7%) have participated as an SP twice, while one-third (33.3%) had multiple experiences in SP.
What are the positive impacts of SP in medical education?	<ul style="list-style-type: none"> • It gives understanding and confidence about the exams being conducted in clinical examination. • It propels someone to continue in the examinations even when mistakes are made. • Simulation makes you have all your instruments handy before going for the examinations. • It improves the patient-doctor relationship. • It gives the feeling of how real-life patients feel on their sick beds. • It improves clinical skills.
What are the negative impacts of SP in medical education?	<ul style="list-style-type: none"> • Simulation creates a burden of thinking about a disease condition that appears not to be there. It is also exhausting and emotionally draining. • Participants agreed that being a simulant is very strenuous and physically exhausting because getting to be examined and questioned by hundreds of students drains them of their energy. • Some have had to resort to taking medications like pain killers to help relieve them immediately after acting as a simulant.

Discussion

The main goal of this study was to evaluate how simulation affected simulated patients among medical students at Ambrose Alli University. The study employs qualitative analysis (whereby a Focused group discussion was employed).

There were 7 participants in the focused group discussion, 5 men and 2 women. Table 1.1 sociodemographic information is displayed. Their ages are between 24 and 32. A moderator, voice recorder, timekeeper, and interviewer worked together during the group discussion to make sure everything said was accurately recorded.

On the knowledge of Simulation, most participants had a commendable understanding of SBL, reflecting findings from a cross-sectional study conducted in May 2013 at a private medical college in Mangalore, Karnataka, India. In the latter study, 247 participants exhibited substantial knowledge of simulation exercises. Similarly, the AAU FGD participants demonstrated a strong grasp of SBL principles and techniques, with a positive perception towards its implementation in medical education.¹²

Also, this observation aligns with a quasi-experimental study at the Mahatma Gandhi Institute of Medical Sciences in Wardha, Maharashtra, India, conducted between April and September 2018. In that study, 90% of first-year medical students were familiar with SBL, underscoring the growing acceptance and integration of simulation in medical curricula worldwide.¹⁴

The favorable effects of simulation on simulated patients were studied with AAU medical students, and it was discovered that 78.57% of students experienced benefits that improved their knowledge and prepared them for examinations. This is comparable to a study by Vinod S. and his colleagues on the advantages and disadvantages of playing the role of standardized patients, which revealed that people who took part in the study had altered their health practices and improved their connections with their healthcare providers as well as their understanding of health.¹²

Despite the evident benefits, the study also uncovered considerable adverse effects associated with Simulation-based learning. A significant proportion of the participants (71.43%) reported experiencing negative impacts, such as anxiety, somatization of symptoms (including nosebleeds and irregular menstrual cycles), and both physical and mental exhaustion. These findings highlight the intense demands placed on SPs, which can lead to substantial physical and psychological strain.

Conclusion.

The qualitative insights from AAU medical students reveal the dual-faceted nature of simulation-based learning. While SBL is highly effective in enhancing medical students' practical skills and theoretical knowledge, it also poses significant challenges, particularly for those acting as simulated patients. The study underscores the necessity of implementing supportive measures to alleviate the adverse effects on SPs, ensuring a more sustainable and balanced approach to medical training. As SBL continues to be integrated into medical education, it is crucial to address these challenges to optimize the learning experience for all participants.

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References.

1. Russell D, Simpson R, Eden M, Foreman P. The use of child actors to simulate pediatric patients in the MRCGP Clinical Skills Assessment (CSA): developing an effective model. *Educ Prim Care* 2015;26(4):242-247.
2. Lubbers J, Rossman C. Satisfaction and self-confidence with nursing clinical simulation: novice learners, medium fidelity, and community settings. *Nurse Educ Today* 2017;48:140-144.
3. Olsen J, Paul P, Lasiuk G, et al. The state of knowledge regarding the use of simulation in pre-licensure nursing education: a mixed method systematic review. *Int J Nurs Educ Scholarsh* 2018;15(1):281-291.
4. Aldridge M. Standardized patients portraying parents in pediatric end of life simulation. *Clin Sim Nurs* 2017;13(7):338-342.
5. Kaplony J, Bowles K, Nestel D, et al. Understanding the impact of simulated patients on healthcare learner's

- communication skills: a systematic review. *Med Educ* 2017;51(12):1209-1219.
6. Nunes de Oliveira S, do Prado ML, Kempfer SS, Martini JG, Caravaca-Morera JA, Bernardi MC. Experiential learning in nursing consultation education via clinical simulation with actors: Action research. *Nurse Educ Today* 2015;35:50-54.
 7. Blackstock, F.C. and Pritchard, S. (2015) Skills development in person-centred physiotherapy (pp. 134-138).
 8. Nestel, D.F., Bearman, M.L. (eds), 2015, Simulated Patient Methodology: Theory, Evidence and Practice, London: Wiley Blackwell.
 9. Plaksin J, Nicholson J, Kundrod S, Zabar S, Kalet A, Altshuler L, The Benefits and Risks of Being a Standardized Patient: A Narrative Review of the Literature. 2016 Feb;9(1): 15-25.
 10. Friederichs H, Weissenstein A, Ligges S, Moller D, Becker JC, Marschall B. Combining simulated patients and simulators: pilot study of hybrid simulation in teaching cardiac auscultation. *Adv Physiol Educ.* 2014 ; 38 (4) : 343 — 7 . doi:10.1152/advan.00039.2013.
 11. Office of Medical Education. Origin of standardized patients in the united states. 2015. [https://meded.med.uky.edu/origin-standardized-patientsunited-states.](https://meded.med.uky.edu/origin-standardized-patientsunited-states)
Accessed 12 Jan 2015
 12. Vinod S, Sachin P, Suvarna S. Usefulness of Simulation Based Learning in First Year Medical Students: A Quasi-experimental study. 2018.
 13. Marwa E, Almaeen A. Student's perception towards medical-simulation training as a method for clinical teaching. *JPMA* 70: 618; 2020) <https://doi.org/10.5455/JPMA.6481>
 14. Plaksin J, Nicholson J, Kundrod S, Zabar S, Kalet A, Aitshuleer L. The Benefits and Risks of Being a Standardised Patient: A Narrative Review of the Literature. *Patient.* 2016 Feb; 9(1):15-25.
 15. ElGeed H, Saffouh EH, Ali R, Awaisu A. *BMC Med Educ* (2021) 21:562 . <https://doi.org/10.1186/s12909-02977-1>.

AN ASSESSMENT ON UTILIZATION OF MODERN CONTRACEPTIVE METHODS: A STUDY AMONG FEMALE UNDERGRADUATES IN SOUTHERN NIGERIA.

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Abstract

Modern contraceptive methods utilize a range products or procedures which prevent conception. These methods are effective in prevention of unwanted pregnancies, particularly among young females, at high risk. The risks associated with non-use of modern contraceptives include unsafe abortion and risk of STIs, while the common fear is risk of complications and difficulty in reversal of contraceptive. This study assessed the predictors of willingness to use modern contraceptive methods among undergraduate females with the aim of addressing concerns early in the lives of educated females of reproductive age bracket who will snowball knowledge gained to educated and uneducated peers.

A descriptive cross-sectional study was conducted among female undergraduate at Igbinedion University, Edo State between January and June 2023. A total of 406 female undergraduates were recruited for the study using multi-stage sampling technique. Data was collected using a pretested, semi-structured self-administered questionnaires and analysis conducted using the IBM-SPSS 25.0.

The mean age of respondents was 19.8 ± 3.3 years. Majority of the respondents were single, 96.0% and christian, 88.9%. On awareness, all (100%) of the respondents were aware of modern contraceptive methods and 86.0% of the respondents had good knowledge of modern contraceptive methods. Current use (Prevalence) was however 16%. Furthermore, 94% of respondents were willing to use modern contraceptives and the main predictor of willingness to use modern contraceptives methods was knowledge ($p = 0.008$).

The results exposed a gap in the level of knowledge and the actual use of modern contraceptives methods. Improving accessibility and implementing targeted health education programs will promote the use of modern contraceptives and address knowledge-use gaps.

Keywords: female undergraduate, knowledge, modern contraceptives, predictors, unwanted pregnancy, willingness.

Introduction

Contraception involves the intentional prevention of conception through the use of various means including sexual practices, drugs, devices or surgical procedures.¹ Modern methods are technological developments which prevent conception- through hormonal or non-hormonal means.² These include condoms (male and female), pills, injectables, devices or surgical sterilization (vasectomy or tubectomy), which are more effective than traditional methods such as coitus interruptus, or lactational amenorrhea method.^{2,3} Modern contraceptives are effective in the prevention of unintended pregnancy among young reproductive females aged 15-49 years. It aids in reducing the occurrence of unintended pregnancies, unsafe abortions and maternal mortality.²

Modern contraceptives are also effective in preventing sexually transmitted infections such as HIV, hepatitis B and C etc especially when used in combination. Various factors may affect the use of modern contraceptives such as age, socioeconomic status and education, access, and disapproval from partner as well as religious and cultural beliefs. Fear of side effects, safety of its use, perceived infertility and infrequent sexual activity may also contribute to their non-use.^{4,5}

Globally an estimated 851 million women use modern contraceptive (49.0% prevalence rate). In developing countries especially Africa, the adoption rate of modern contraception is significantly low. In Nigeria the prevalence rate stands at 10.3%, with higher distribution towards Southern Nigeria.⁶

Globally, unplanned pregnancies are attributable to about 79,000 maternal deaths, with 1.1 million infant deaths resulting from lack of access to contraceptives, particularly in developing countries. Over half (885 million) of the women in reproductive age are in need of modern contraception. The proportion of women with unmet need for modern contraception is highest in sub-Saharan Africa.^{7,8}

About 45% of all abortions are unsafe and are a preventable cause of maternal mortality sadly, 97% of all unsafe abortions worldwide occur in developing countries with up to 220 deaths per 100,000 unsafe abortions, and complications costing the health sector an estimated \$533million per year and over \$900 million due to long term disabilities.^{9,10}

Only an estimated 15 million adolescents use modern contraceptives worldwide, with a great majority at high risk for unwanted pregnancies and abortion. About 20,000 births per day has been noted among females under 18 years and this greatly undermines achieving the sustainable

development goals on hunger, extreme poverty, universal primary education and maternal health.^{7,9}

Nigeria has a fertility rate of 5.3% per woman with only 12% of women contraceptive use, the country plans on achieving 27% use by 2024.¹¹ In Nigeria, the unmet need for contraception is 20% with contraceptive prevalence rate of 15% and 9 million pregnancies yearly resulting in 50,000 maternal deaths yearly. Modern contraceptive prevalence rate is 8.8% and unmarried, sexually active females are less likely to use highly effective methods of contraceptives than married counterparts.¹¹

The median age at first sexual experience in Nigeria, is 16 years;¹² this accompanied by the low uptake of modern contraceptives predisposes to various health risks such as HIV infection, STIs, early marriage, unwanted pregnancy, and unsafe abortions with its associated complications.¹² Levels of unintended pregnancies continue to be high in Nigeria especially among undergraduate students where incidence has been found to be on the increase every year.^{13,14}

This, is tandem with the already established fact of low uptake of modern contraceptives among these same students, is a recipe for unending chain of health and social challenges. Knowing the situation in the tertiary institutions where most of the educated sexually active females are pooled, will guide health intervention policies through health education attempts that will facilitate a snowball effect of dissemination of relevant information on modern contraceptive benefits and use to both their educated and uneducated peers to ultimately help in reducing the incidence of sexually transmitted diseases, reduce unsafe abortion, reduce adolescent unwanted pregnancies, reduce maternal morbidity/mortality, minimise school dropouts and poverty in the society.⁷

Methodology

Study Area: The study was conducted among students of Igbinedion University, Okada, Edo State in South-South Nigeria. Edo state is in the South-South geopolitical zone of Nigeria. Okada community is in Ovia North-East Local Government Area.¹⁵ Igbinedion University is one of the private universities in the southern Nigeria. It was established in 1999 and has eight (8) colleges. The university has over 5,000 students majority of which are in the College of Health Sciences. Almost 55% of the student population are female with a predominance of Christians.¹⁵

Study Design: A descriptive, cross-sectional analytical study was utilized in this study. Only

female undergraduates of Igbinedion University who gave written informed consent for this study were included into this study.

Sample Size Determination: The sample size (n) was calculated using the Cochran formula used for descriptive studies on single population. $n = Z^2pq/d^2$ size; $Z = 1.96$ (at 95% confidence interval); in this case $p = 39.3\%$, was obtained from a study conducted to assess knowledge, use and related behaviours.²⁸ Calculated n was 366. A 10% non-response rate inclusion gave a final sample size (n) of 406.

Sampling Method: Respondents who met the inclusion criteria were selected through multi-stage sampling technique in three stages. For the first stage, Igbinedion University was selected by simple random sampling from four tertiary facilities in Edo-south senatorial zone (University of Benin, College of Education Ekiadolor, Usen Polytechnic and Igbinedion University, Okada). At the second stage, four colleges were then selected from the eight colleges (Health sciences, Pharmacy, Law and Business management sciences). For the third stage, departments and various arms/levels were captured and selected utilizing stratified sampling by proportional allocation and the final predetermined respondents for each arm/level for each department selected by systematic sampling technique utilizing a predetermined sampling interval until the final desired minimum sample size was achieved.

Data Management: A pretested, structured self-administered questionnaire adapted from one developed by Khasay et.al²⁶ was utilized for this study. Analysis was done using IBM-SPSS version 25.0 and results presented using frequency tables, proportions, and proses.

Ethical Considerations: Ethical clearance was obtained from the Ethic and Research Committee of Igbinedion University Teaching Hospital, Okada, Edo State. Written and informed consent was obtained from all respondents. All data in hard and soft copies were stored safe, sealed away and passworded. Respondents were given a concise health education on modern contraceptive methods, their benefits, merits, demerits, where to get related services; and all their fears and questions addressed.

Results

Table 1: Knowledge Of Modern Contraceptive Methods Among Respondents

VARIABLE	FREQUENCY (n = 406)	PERCENT (%)
Awareness of modern contraceptives		
Yes	406	100.0
No	0.0	0.0
Source of information		
Friends	365	89.9
Television	354	87.2
School	345	85.0
Internet	335	82.5
Social media	251	61.8
Church	245	60.3
Health professional	233	57.4
Family members	187	46.1
Radio	182	44.8
Mosques	20	4.9
Meaning of modern contraceptives		
Use of medical means to prevent pregnancy	320	78.8
Use of condoms to prevent pregnancy	146	36.0
Use of withdrawal method to prevent pregnancy	173	42.6
Use of devices to prevent pregnancy	152	37.4
Monitoring of monthly cycle to prevent pregnancy	64	15.8
Modern methods		
Male condom	351	86.5
Hormonal pills	291	71.7
Withdrawal method	278	68.5
Vasectomy/Male sterilization	228	56.2
Implants	227	55.9
Injectables	192	47.3
Abstinence	187	46.1
Intrauterine devices	184	45.3
Tubal ligation/Female sterilization	168	41.4
Female condom	103	25.4
Lactational amenorrhea	65	16.0
Willing to Use Currently Using (Prevalence)	382	94.0
	65	16.0

All the respondents (406, 100.0%) were aware of modern methods of contraception. The commonest sources of information were friends (365, 89.9%), television (354, 87.2%), school (345, 85.0%) and the internet (335, 82.5%).

Three hundred and twenty (78.8%) of the respondents thought that modern contraceptives involved using medical means to prevent pregnancy. The commonest modern contraceptive methods known to the respondents were male condoms (351, 86.5%), hormonal pills (291, 71.7%), withdrawal method (278, 68.5%), vasectomy/male sterilization (228, 56.2%) and implants (227, 55.9%). Those willing to use were 94% and those currently using (Prevalence) was however 16%.

Table 2: Socio-Demographic Characteristics And Willingness To Use Modern Contraceptives Among Respondents

Variable	Willingness to use modern contraceptive methods		Fisher's exact test	p-value
	Willing n = 383 Freq (%)	Unwilling n = 23 Freq (%)		
Age group (years)				
15 – 24	356 (94.4)	21 (5.6)	1.096	>0.999
25 – 35	25 (92.6)	2 (7.4)		
35 – 44	2 (100.0)	0 (0.0)		
Respondent's marital status				
Single	368 (94.4)	22 (5.6)	0.830	>0.999
Married	11 (91.7)	1 (8.3)		
Cohabiting	4 (100.0)	0 (0.0)		
Religion				
Christian	342 (94.7)	19 (5.3)	3.062	0.184
Islam	37 (92.5)	3 (7.5)		
ATR	4 (80.0)	1 (20.0)		
Faculty/College				
Health sciences	200 (95.2)	10 (4.8)	1.067	0.826
Law	80 (93.0)	6 (7.0)		
Pharmacy	84 (93.3)	6 (6.7)		
Business management sciences	19 (95.0)	1 (5.0)		
Level				
100	85 (93.4)	6 (6.6)	4.717	0.427
200	60 (93.8)	4 (6.3)		
300	63 (90.0)	7 (10.0)		
400	64 (95.5)	3 (4.5)		
500	80 (96.4)	3 (3.6)		
600	31 (100.0)	0 (0.0)		
Monthly income				
< 50,000 naira	73 (89.0)	9 (11.0)	5.062	0.054
50,000 – 100,000 naira	291 (95.7)	13 (4.3)		
> 100,000 naira	19 (95.0)	1 (5.0)		

Respondents aged 35 – 44 years (4, 100.0%) had the highest proportion of those willing to use modern contraception. The relationship between age of the respondents and willingness to use modern contraceptives was not statistically significant ($p > 0.999$).

Respondents who were Christian had the highest proportion (342, 94.7%) of those who were willing to use modern contraception but the relationship between respondent's religion and willingness to use modern contraceptives was not statistically significant ($p = 0.184$).

Respondents who were in the college of health sciences had the highest proportion (200, 95.2%) of respondents who were willing to use modern contraception but the relationship between the faculty/college of the respondent and their willingness to use modern contraceptives was not statistically significant ($p = 0.826$). Respondents who were in 600 level had the highest proportion (31, 100.0%) of those who were willing to use modern contraception but the relationship between respondent's level and their willingness to use modern contraceptives was not statistically significant ($p = 0.427$).

Respondents who had a monthly allowance of between 50,000 and 100,000 had the highest proportion (291, 95.7%) of respondents who were willing to use modern contraception but the relationship between respondent's monthly allowance and their willingness to use modern contraceptives was not statistically significant ($p = 0.054$).

Table 3: Knowledge Of And Willingness To Use Modern Contraceptives Among Respondents

Variable	Willingness to use modern contraceptive methods		χ^2	p-value
	Willing n = 383 Freq (%)	Unwilling n = 23 Freq (%)		
Knowledge of modern contraceptives				
Good	334 (95.7)	15 (4.3)	8.693	0.008
Poor	49 (86.0)	8 (14.0)		

Respondents who had good knowledge of modern contraceptives had the higher proportion (334, 95.7%) of those who were willing to use modern contraception. The relationship between respondent's knowledge of modern contraception and their willingness to use modern contraception was statistically significant ($p = 0.008$).

Discussion

The study was conducted among four hundred and six female undergraduate students Igbinedion University, Okada, Edo State. The Sociodemographic distribution of the respondents showed that a majority of the respondents (92.8%) were aged between 15-24 years, followed by 25-35 years. All the respondents were within the reproductive age group with most falling in the bracket of 15-35 years. This gives an opportunity for focused intervention on the desired vulnerable target age group prone to health and social challenges associated with unsafe, unwanted pregnancies, which is the scope of this study.

All of the respondents reported being aware of modern contraceptives and a majority had good knowledge. This is expectedly so, giving this is a highly educated and research-oriented population, with access to numerous sources of information like the internet (especially with the new trend among young adults of sourcing most information from easily accessible various forms of artificial intelligence like CHAT-GPT and META-AI). This was corroborated by findings from this study where over four-fifth of responses on sources of information was from the internet. Most of the respondents sourced their information from their friends and partner; barely half got their information on modern contraception from health practitioners. These were similar findings to other studies.¹⁸⁻²¹

It is important to emphasize here that the initial source of information is very critical in guiding the inexperienced and adventurous young undergraduate adult on his or her sexual choices and exploration. They are likely to make the wrong

choices if not properly guided to make the right decisions and choices with the right information giving by the right well-trained health personnel in an easy to access and young-persons-friendly educational unit and environment. A "Family Life Education Unit", equipped with the qualified and well-trained personnel, samples of the various modern contraceptive, young persons

friendly, utmost privacy, welcoming and non-judgmental ambience is recommended in higher institutions, likely at their health facilities. This will bring accessibility to the right information from the right people close to them, preventing wrong choices and decisions being made by young persons. They must also be made aware that such services are available, where, and how to source them to source them.

Awareness and likelihood of using the Male condoms accounted for almost nine-tenth of responses followed by hormonal pills and withdrawal method which both accounted for seven-tenth of the responses respectively. Female tubal ligation and female condom accounted for two-fifth and a quarter of response respectively. These findings were similar to that of other studies the male condoms accounted for over 75.4% of responses regarding awareness.^{18,19}

Peer group and Partner influence are likely contributory to the awareness of and thus use of a particular modern contraceptive methods as also observed in other studies;²⁰ with male condoms being the most preferred method. Male partner consent as a source of information and guide in determining the choice of contraceptive use may likely pose as challenge to the quality of information and decision on whether to use, actual use and appropriate use of modern contraceptive methods by the young female undergraduate.

If the partner is inadequately informed especially with the non-surgical modern contraceptives like the injectables, failure rates will be higher, the potential for sexually transmitted infections (if not used in combination) are high, unwanted pregnancies with its attendant complications like unsafe abortions school drop-out, morbidities and mortalities are imminent. Therefore, increased knowledge on, availability, and affordability of feminine modern contraceptive methods like the female condoms, and hormonal injectables for both sexes will address the glaring existing knowledge gap and actual usage. The low

awareness of the female contraceptive methods hinders the implementation of effective measures to prevent unwanted pregnancies, abortions, and sexually transmitted diseases.²¹

Despite the respondents having a high knowledge of modern contraceptives, less than one-fifth of them were currently using these methods. The most commonly used methods were male condoms, hormonal pills, and injectables, which aligns with findings from other studies.¹⁸⁻²¹ This lack of positive correlation between knowledge and use of modern contraception is consistent with previous studies among undergraduates.^{13,16} That the use of modern contraception is poor in spite of the high knowledge and awareness level amongst the respondents maybe due to the associated myths and fears like significant weight gain, menstrual irregularities like Dysfunctional Uterine Bleeding which may require hospital visits and even blood transfusions, surgical procedures with its associated possible complications and inability to achieve conception whenever one so desires much later in life.^{1,2,16,17} Thus targeted information provided from the right source to address these poor knowledge will address these fears.

Over half of the respondents (52.7%) were sexually active with a contraceptive prevalence rate of 32%, this is similar to studies done in the southern Nigeria.^{20,23} Two-thirds of the respondents had never used modern contraceptives, this was mainly due to having never engaged in sexual activity;⁴ others included infrequent sexual activity, religious concerns, fear of side effects and opposition from their partner. This significant proportion that has never attained coitarche are a critical mass exposed by this research for targeted education on Healthful Sexual and reproductive/ Family Life Education. If targeted during school enrollment into the tertiary institutions, they will be a fertile ground for high impact education-intervention in long term prevention strategies in minimizing the burden on the strained healthcare system (already overwhelmed by the high infant, childhood, teenage and maternal morbidities, and mortalities associated with unplanned pregnancies).

Furthermore, less than 50% of the participants agreed to using modern contraceptives if they later became sexually active. Low use of contraceptives could lead to unplanned pregnancies, physical and psychological health issues and may also result in unsafe abortions.²¹

This is a worrying discovery, especially for undergraduate females, as it increases their risk of experiencing other negative consequences such as sexually transmitted infections in addition to unintended pregnancies, and unsafe abortions

which may result in the termination of their education and disruption of their career path.

On the willingness to use modern contraceptives, most of the respondents were willing but only barely 16% actually used modern contraception. Accessibility, partner approval, and partner choice were also contributory factors to utilization. The results of the study identified knowledge as the main determinant of willingness to use modern contraceptives among female undergraduates ($p = 0.008$). Respondents who had good knowledge of modern contraceptives showed more willingness to use modern contraceptives. This is consistent with the findings of other studies²⁴⁻²⁶ The study noted that marital status, religion, faculty/college, level, and monthly allowance do not significantly determine willingness to use modern contraceptives among female undergraduates.

These insights could inform the development of targeted interventions and educational programs to promote the use of modern contraceptives among this population. If the unmet need for modern contraceptives in Nigeria is achieved, alongside adequate maternal and infant care, unwanted pregnancies are estimated to reduce by 77%, leading to a reduction in abortion rate from over a million to less than 300,000 per year. Maternal mortality rate would be reduced by 68% and infant mortality by 85%.⁸ The burden on the healthcare system will lessen overtime. Health workers will be less overburdened and overwhelmed with the cascade of problems associated with unwanted pregnancies. The highly scares funding and poorly financed health budget will be saved and channelled to other components of the health sector for further strengthening. Critical health services and essential medicines will be redirected to other health sectors like the health information management system that are in dire need of funding and attention. The nation's health indices on the Sustainable Development Goals will improve along with the national GDP giving that more of the "Girl Child will remain in school and finish school".

Conclusion

The study showed that all the respondents were aware of modern contraceptive methods and majority of the respondents had good knowledge of modern contraceptives with respondents' knowledge being the only predictor of willingness to use modern contraceptives. Sexual and reproductive/ Family Life Education targeted at students during school enrollment into the tertiary institutions, will be a fertile ground for high impact education-driven interventions in long term prevention strategies in minimizing the burden on

the already strained healthcare system. Further research on impact assessment of these interventions will guide the narrative on the way forward on more gender specific interventions to improve the well being and future of the girl child.

Conflicts Of Interest: None.

References

1. Rakhi J, Sumathi M. Contraceptive methods: Needs, options and utilization. *Journal of Obstetrics and Gynecology of India*. 2011;61(6):626-634. doi:10.1007/s13224-011-0107-7
2. Hubacher D, Trussell J. A Definition Of Modern Contraceptive Methods. *Contraception*. 2015;92(5):420-421. doi:10.1016/j.contraception.2015.08.008
3. United Nations. National Family Health Survey (NFHS-2). Accessed February 18, 2023. https://dhsprogram.com/pubs/pdf/frind2/frin_d2.pdf
4. Ajayi AI, Adeniyi OV, Akpan W. Use Of Traditional And Modern Contraceptives Among Childbearing Women: Findings From A Mixed Methods Study In Two Southwestern Nigerian States. *BMC Public Health*. 2018;18(1). doi:10.1186/s12889-018-5522-6
5. Sinai I, Omoluabi E, Jimoh A, Jurczynska K. Unmet Need For Family Planning And Barriers To Contraceptive Use In Kaduna, Nigeria: Culture, Myths And Perceptions. *Culture Health Sex*. 2020;22(11):1253-1268. doi:10.1080/13691058.2019.1672894
6. Johnson OE. Determinants of Modern Contraceptive Uptake among Nigerian Women: Evidence from the National Demographic and Health Survey. *Africa Journal of Reproductive Health*. 2017;21(3):89. Accessed March 16, 2023. <https://ajrh.info/index.php/ajrh/article/view/1084>
7. Starbird E, Norton M, Marcus R. Investing in family planning: Key to achieving the sustainable development goals. Vol. 4, Global Health Science and Practice. Johns Hopkins University Press; 2016. p.191-210
8. Darroch JE. Adding It Up: Investing in Contraception and Maternal and Newborn Health, 2017 Estimation Methodology [Internet]. 2018. https://www.guttmacher.org/sites/default/files/report_pdf/adding-it-up-2017-estimation-methodology.pdf.
9. World Health Organization. Key Facts. 2021 [cited 2023 Mar 16]. Abortion. Available from: <https://www.who.int/news-room/fact-sheets/detail/abortion>
10. Lattof SR, Coast E, van der Meulen Rodgers Y, Moore B, Poss C. The mesoeconomics of abortion: A scoping review and analysis of the economic effects of abortion on health systems. *PLoS One*. 2020 Nov 1;15(11 November).
11. Federal Ministry of Health. Nigeria Family Planning Blueprint [Internet]. 30th June 2020. 2020 Aug [cited 2023 Mar 17]. Available from: <https://health.gov.ng/doc/Final-2020-Blueprint.pdf>
12. Yaya S, Bishwajit G. Age at first sexual intercourse and multiple sexual partnerships among women in Nigeria: A Cross-Sectional Analysis. *Front Med (Lausanne)*. 2018 Jun 1;5(JUN).
13. United Nations. The Millennium Development Goals Report [Internet]. 2011 [cited 2023 Feb 18]. Available from: 11. United Nations.(2011).The Millennium Development Goals Report. Retrieved from www.un.org/millenniumgoals/11_MDG%20Report_EN.pdf
14. Henshaw SK, Singh S, Oye-Adeniran BA, Adewole IF, Cuca YP. The Incidence of Induced Abortion in Nigeria [Internet]. Vol. 24, *Family Planning Perspectives*. 1998. Available from: <https://about.jstor.org/terms>
15. About IUO – Igbinedion University Okada [Internet]. [cited 2023 Jun 1]. Available from: <https://iuokada.edu.ng/about-us/>
16. World Health Organization. Reproductive Health and Research., K4Health. Family Planning : A Global Handbook For Providers : Evidence-Based Guidance Developed Through Worldwide Collaboration. 2018;440.
17. Moss DA, Snyder MJ, Lin L. Options for women with unintended pregnancy. *American Family Physician Journal*. 2015;91(8).
18. Nsubuga H, Sekandi JN, Sempeera H, Makumbi FE. Contraceptive Use, Knowledge, Attitude, Perceptions And Sexual Behavior Among Female University Students In Uganda: A Cross-Sectional Survey. *BMC Womens Health*. 2016 Jan 27;16(1).
19. Somba MJ, Mbonile M, Obure J, Mahande MJ. Sexual Behaviour, Contraceptive Knowledge And Use Among Female Undergraduates' Students Of Muhimbili And Dar Es Salaam Universities, Tanzania: A Cross-Sectional Study. *BMC Womens Health*. 2014;14(1).
20. Idris T, Oseni A, Affusim CC. Determinants of Contraceptive Use Among Female Undergraduates in Edo State. 2016; Available from: <https://doi.org/10.21203/rs.3.rs-48803/v1>
21. Asekun-Olarinmoye EO, Adebimpe WO, Bamidele JO, Odu OO, Asekun-Olarinmoye IO, Ojofeitimi EO. Barriers To Use Of Modern Contraceptives Among Women In An Inner City Area Of Osogbo Metropolis, Osun State, Nigeria. *International Journal of Womens Health*. 2013;5(1).
22. Agbo OJ, Eguvbe AO, Alabra PW, Alagoa DO. Knowledge of Modern Contraceptives Methods and Its Uptake Among Female

- Students of a Tertiary Educational Institution in South- South Nigeria. *European Journal of Medical and Health Sciences*. 2020;2(5).
- 23. Aigbiremolen A, Duru C, Abah S, Abejegah C, Asalu O, Oriaifo B. Contraception among tertiary students: Knowledge, use, and behaviour of female undergraduates in Edo State, Nigeria. *Global Journal of Medical Research (K)*. 2014;14(2).
 - 24. Fehintola F, Okoro N, Adedibu D, Adeniyi K, Adeniyi C, Folorunso O. Predictors of Willingness to Use Modern Contraceptives among female undergraduate students in a tertiary institution in Nigeria: The Health Belief Approach. *Journal of Community Medicine and Primary Health Care* [Internet]. 2022 Dec 8;34 (3):153–65. Available from: <https://www.ajol.info/index.php/jcmphc/article/view/237967>
 - 25. Esohe OO, Obehi HO. Assessment of the unmet needs of contraception among female undergraduate students in southern Nigeria. *Journal of Public Health Epidemiology*. 2018;10(11).
 - 26. Kahsay ZH, Tegegne D, Mohammed E, Kiros G. Application Of Individual Behavioral Models To Predict Willingness To Use Modern Contraceptives Among Pastoralist Women In Afar Region, Northern Ethiopia. *PLoS One*. 2018;13(5).

ASSESSMENT OF HYGIENE AND AVAILABLE OPTIONS FOR DEFEACATION IN A SEMI URBAN COMMUNITY IN SOUTH-SOUTH NIGERIA

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Abstract

To assess hygiene and available options for defeacation in a semi-urban community. A descriptive cross-sectional study was carried out among 250 households in Okada, Edo State, Nigeria. The respondents were selected by multistage sampling method; five Local Government electoral wards were defined as clusters using sample frame containing the list of clusters. Three of the five clusters were selected by simple random sampling using table of random numbers. The households in each of the three clusters were selected using one respondent per household but in a polygamous family, the most senior wife was selected due to their wealth of information on the family. Structured, pre-tested, interviewer-administered questionnaire was used for data collection. Data was analyzed using IBM SPSS version 21.0 and level of significance was set at $p < 0.05$.

Almost all 245(98.0%) of the households had one toilet type in their houses with majority 142(57.9%) of the households having the ventilated improved latrines and only about a fourth 52(20.8%) of the households practiced good toilet hygiene. A higher proportions 139(55.6%) of the households had poor toilet standards. The level of education was statistically significant with the practice of open defecation ($p=0.001$).

Only about a fourth of the households practiced good toilet hygiene and majority of the households had poor toilet standards. The government should partner with NGOs to support and strengthen the participation of local communities in improving water and sanitation management towards achieving the SDG goal 6 which is access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030.

Keyword: Hygiene, Nigeria, Okada, Practice, Sanitation.

Introduction

Hygiene is one of the least expensive, most cost-effective changes that can be made with immediate rewards in quality of life.¹ Good community hygiene can be an affordable way to make a big impact on the health of a community and nation at large.^{1,2} History has demonstrated that poor sanitation is one of the most important contributors to the world's morbidity and mortality, with progress in sanitation providing significant

benefits to public health as well as to social, economic and environmental factors.^{1,2} Having access to sanitation is a basic human right, yet almost a third of the world's population suffer on a daily basis from a lack of access to a clean and functioning toilet.^{3,4} Therefore, sanitation is an important foundation required towards the protection of public health and human welfare to achieving human development and security.¹ Inadequate sanitation has direct effect on health

of individuals, families, communities and nation as a whole.²⁻⁴ The negative impact of poor sanitation on human and environmental health has been widely acknowledged and includes exposure to acute excreta-related illness such as diarrhoea, cholera, dysentery, typhoid, and hepatitis A, contamination of drinking water bodies, environmental degradation, malnutrition and poor school attendance in children.^{2,4,5} Whereas inadequate sanitation is estimated to cause 280,000 diarrheal deaths annually across the globe, about 2800 people die daily from illnesses related to inadequate sanitation, poor hygiene and unsafe water in Africa.^{5,6} Of the 1.8 million people estimated to die each year from diarrhoea, 1.5 million are children.^{5,7} In Nigeria, children under 5 years old have a 38.0% higher risk of dying from lack of improved sanitation and water sources.⁷⁻¹⁰

Nigeria became the number one open defecation nation globally in 2019 passing India, Indonesia and Ethiopia.^{6,11} It is estimated that 50 million Nigerians (10 million households) defecate in the open.¹² Open defecation is the act of passing excreta in open air locations instead of in hygienic, covered locations.^{7-9,11,12} The phenomenon does not just occur in the rural areas of Nigeria but also in the cities, and among the educated class in public tertiary institutions in a parlance popularly known as 'throwing shot-put', business and residential areas.^{10,12-18} Over 47 million Nigerians defecate openly in and on bushes, gutters, sidewalks, motor parks, recreation parks, rivers and streets amongst others. Some efforts have been made over the decades to reduce the cases of open defecation in Nigeria. Regrettably, they remain mainly efforts, with only 14 of 774 local governments in the country free of open defecation.¹²

In 2019, Nigeria signed Executive Order 009 to tackle open defecation. In the same year, Nigeria's Ministry of Water Resources, in collaboration with UNICEF, launched the initiative tagged 'Nigeria Open-Defecation-Free By 2025: A National Road Map' in order to end the inimical practice by 2025.¹² Apart from bringing a negative social stigma to Nigeria, open defecation also poses obvious environmental, health and economic problems for Nigeria and its nationals. It pollutes the environment and exposes children and adults to critical health problems.^{13,14,16} As per a World Bank Report (2012), Nigeria loses NGN 455bn or US\$3bn annually due to poor sanitation. This works out to US\$20 per capita/year and constitutes 1.3 per cent of Nigeria's GDP. According to the same report, open defecation alone costs Nigeria over US\$1bn a year.^{19,20} The market potential of sanitation in the country is huge.¹⁵

If the 46 million people that defecate in the open

at present opt for a toilet, the demand for material and labour, on a conservative estimate, will work out to NGN 1250bn or over US\$8bn.^{4,19,20} Universal access to water and sanitation has been seen as the essential step in reducing the preventable infectious diseases burden, but it is now clear that this is best achieved by programs that integrate hygiene promotion with improvements in water quality and availability, and sanitation.^{10,11,14,19} This approach has been integrated into the Sustainable Development Goal (SDG) Number 6 whose second target states: "By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations".^{6,8,9,19,20} Due to their close linkages, water, sanitation, hygiene are together abbreviated and funded under the term WASH in development cooperation.^{21,22}

Lack of improved sanitation facilities and the high prevalence of persons utilizing open defecation is a major setback to developmental growth globally and these are of major public health relevance considering the fact that it affects not just children but the family, community and country.²³⁻²⁸ Therefore, a study on community hygiene and knowledge of available options for defecation in semi-rural, Nigeria is considered timely and significant because it will provide appropriate, affordable and acceptable sanitation technology options for defecation and general sanitation, and also improve already existing facilities and technology already in use in the community.

A descriptive cross-sectional study was carried out among 250 households of semi-urban community, Okada, Edo State, Nigeria. The respondents were selected by multi-stage sampling method; used the cluster sampling method, The Local Government Area consists of electoral wards that were defined as clusters and a sample frame containing the list of clusters was constructed. Three out of the five clusters were selected by simple random sampling method. Subsequently the households in each of the selected clusters were selected. A respondent per household was selected to participate in the study and in a polygamous family the most senior wife was selected due to their wealth of information on the family. Data was collected with the aid of an interviewer administered questionnaires in the university community. The data was assessed for completeness, serialized, coded and entered into Statistical Package for Scientific Solution (SPSS 20) for analysis. The results were presented in frequency tables, charts and prose. Means were compared using t-test and bivariate analysis was done using chi-squared test. A p value less than 0.05 was considered statistically significant. The information obtained was based on self-reporting

and therefore subject to information bias. The ethical clearance to carry out the survey was sought and obtained from the Igbiniedion University, Okada, Ethical Committee (Ethic clearance number: IUTH/R.24/VOL.1/34C) before administration of the questionnaires. Confidentiality was assured by informing respondents that personal information will not be divulged.

Result

In a survey to assess hygiene and available options for defecation in a semi-urban community, Okada, Edo State. Two hundred and fifty respondents were interviewed and the response rate was 100%.

Table 1: Pattern of Toilet Use

Number of People using Toilets		
Category	Frequency (n)	Percent (%)
1-5	99	39.6
6-10	94	37.6
11-15	45	18.0
15-20	12	4.8
Type of Toilet Present In The House		
Pour toilets	4	1.6
None	5	2.0
Flush toilet	29	11.6
Open pit latrines	70	28.0
Ventilated pit latrines	142	56.8
Presence Of Water Source In The Toilet And Hand Washing After Defecation		
Present	93	37.2
Absent	157	62.8
Respondents That Wash Their Hands After Defecation		
Water and Ash	51	20.4
Water and Soap	68	27.2
Water only	131	52.4
How Often Respondents Clean Their Toilet		
Daily	19	7.6
When its dirty	30	12.0
Every 2 weeks	93	33.2
Weekly	118	47.2

All most all houses had toilets that were being used by 1-5 persons 99(39.6%) and 6-10 persons 94 (37.6%). A significant proportion 207(82.8%) of the respondents live in rented apartments.

Almost all 245 (98.0%) households had one toilet type in their houses, with majority 142(56.8%) of them having the Ventilated pit latrines. Just only 5(2.0%) correspondents had no toilet in their houses.

Majority 134(53.6%) of the household toilets were located outside the house. About three quarters 185(75.0%) of the respondents shared toilet facilities while only 65(26.0%) had private facilities.

A higher proportion 147(58.8%) of the households had separate male toilets from females, 157(62.8%) of respondents had no water source within and around the toilet facilities.

A higher proportion of respondents 131(52.4%) wash their hands with water alone as against those that use water and soap and those using water and ash 68(47.6%) and 51(20.4%) respectively.

Few respondents 39(12.0%) wash their toilets when it is dirty, while a larger proportion of respondents 118(47.2%) wash their toilets weekly.

Table 2: Practise and Perception of Open Defecation

Practice of Open Defecation		
Category	Frequency (n)	Percent (%)
Never practiced	29	11.6
Within last 1 year	35	14.0
Within last 1 month	41	16.4
Within last 3 months	58	23.2
Within last 6 months	87	34.8

A higher proportion of respondents have practiced open defecation within the last 6 months 87(34.8%) and within the last 3 months 87(23.2%) respectively, 159(63.9%) were satisfied with their current sanitation practice while 129(51.6%)

Satisfaction With Current Sanitation Practises		
Satisfied	159	63.9
Not satisfied	91	36.4
Satisfaction With Current Toilet Standard		
Satisfied	116	46.4
Not satisfied	134	53.6
Why Toilet Standard Has Not Been Improved		
Materials	13	5.2
No need	116	46.4
Cost	121	48.4
Toilet Facility Standards		
Door	235	94.0
Window	217	86.8
Cemented floors	199	79.6
Removable covers	78	31.2
Vent pipe and Fly screen	78	31.2
Removable cover slab	83	33.2
Assessment Of Toilet Standards		
Good	40	16
Fair	72	28.8
Poor	139	55.6
Assessment Of Toilet Hygiene Practises		
Good	52	20.8
Fair	119	47.6
Poor	79	31.6

Table 3: Level Of Education And Practise Of Open Defecation

Level of Education	Practice of Open Defecation		Total
	Yes	No	
None	17 (6.8)	5 (2.0)	22 (8.8)
Primary	44 (17.6)	41 (16.4)	85 (37)
Secondary	55 (22)	57 (22.8)	112 (44.8)
Tertiary	5 (2)	26 (10.4)	31 (12.4)
Total	121 (48.4)	129 (51.6)	250 (100)

Chi square = 20.68 p= 0.01

With increasing level of education, the practice of open defecation reduced. This result is statistically significant.

Table 4: Monthly Income and Type of Toilet In The House.

Monthly income	Type of toilet in the house					Total
	Ventilated latrines	flush toilets	Pour toilets	Open pits	None	
1,000 – 25,000	85(46.2)	24(13.04)	4(2.17)	66(35.87)	5(2.72)	184(100)
26,000 – 50,000	47(83.92)	5(8.92)	0(0)	4(7.16)	0(0)	56(100)
51,000 – 100,000	10(100)	0(0)	0(0)	0(0)	0(0)	10(100)
Total	142 (56.8)	29 (11.6)	4 (1.6)	70 (28)	5 (2)	250 (100)

Chi square= 34.81 p=0.01

With increasing level of income, respondents had access to better toilet facilities. This finding is statistically significant.

Table 5: Presence of Toilet Facility and Practice of Open Defecation

Presence of toilet facility	Practice of open defecation		Total
	Yes	No	
Present	121(49.39)	124(49.6)	245(100)
Absent	5(100)	0(0)	5(100)
Total	126(50.4)	124(49.6)	250(100)

Chi square = 4.786 p= 0.029

were not satisfied with their current sanitation/toilet standards.

A higher proportion 139(55.6%) of the correspondents had poor toilet standards as against the respondents that had good toilet standards 40(16.0%) while 52(20.8%) practiced good toilet hygiene, as against the higher number of respondents who practiced fair 119(47.6%) and poor 79(31.6%) toilet hygiene.

There was a higher incidence of open defecation practice amongst respondents with no toilet facilities in their houses. This result is statistically significant.

Table 6: Proximity Of Water Source And How Often Toilet Is Cleaned

Proximity	How often it is cleaned					Total
	Daily	Weekly	2 weekly	When dirty	Don't wash	
Within toilet	19(15.44)	70(56.91)	19(15.44)	0(0)	15(12.2)	123(100)
Outside toilet	0(0)	48(37.79)	44(34.64)	30(23.62)	5(3.93)	127(100)
Total	19(7.6)	118(47.2)	63(25.2)	30(12)	20(8)	250(100)

Chi square = 67.97 p = 0.01

Respondents, who had water sources within their toilet facilities, washed their toilets more frequently than those that had theirs outside or from a distant source. This result is statistically significant.

Discussion

Almost all households have one toilet type in their houses with ventilated improved toilet facility as most used and majority of the toilet were located outside their buildings. These findings were in contrast to studies conducted where fewer of the population had access to any toilet facility³²⁻³⁴. Majority of the toilets where found outside the homes probably due to the fact most of their toilets were VIPs and these may be prone to offensive odour. A recent report by the WHO and UNICEF estimates that approximately 2.5 billion people live without improved sanitation⁷, an implication of this may be that Nigeria is gradually moving to achieve SDG goal 6 target which is access to adequate and equitable sanitation and hygiene for all and end open defecation by 2030^{8,9}.

Majority of the houses had toilets that were being used by between 1-10 persons however, a higher proportion of households have their male toilets separated from the females and this finding was in contrast to studies in Alanamu, Kwara state where they had more toilets for users with separate toilets for different genders²⁵. Having adequate access to privacy when one uses a toilet facilities is a human right and it extends to women's equality and rights.^{8,9} Therefore separation of the facility gives individuals a sense of protection, safety and happiness when they can relieve themselves without fear of the opposite sex barging in on them in the process. A higher proportion of respondents have practiced open defecation within the last 6 months and within the last 3 months. This findings is similar to studies conducted in India and Ethiopia³⁴⁻³⁶ but some studies done in Nigeria, and Ghana the results were contrasting as very few respondents practiced open defecation^{24,29,31}.

Open defecation is the worst form of sanitation as it pollutes public open spaces leading to air pollution which imposes an economic burden on tourism, water bodies and drainages are contaminated in the process and this leads to increase prevalence of water borne disease and environmental enteropathy. This may increase infant and under

five morbidity and mortality rate, iron deficiency anaemia among adolescent, worm infestation, high expenditure on health care, loss of work and school hours and poverty²⁵⁻⁸.

Majority of the respondents had no water source within and around the toilet facilities. This was different from a studies conducted in Ghana, Nigeria and Bangladesh where about three-quarters had water source and had access to water after using the toilet^{24,29,31,37}. This may be due to lack of readily available water supply. The implication of poor or lack of water supply will cause an increase in feco-oral disease transmission leading to morbidity and mortality rate and also decreased life expectancy^{5,6,9}. A higher proportion of respondents wash their hands with water alone as against those that use water and soap after defecation. This was in contrast with a study in Bangladesh were majority used soil and water³⁵, while several studies showed that majority used water and soap after defecation^{24,25,36}. The use of water alone may be due to poor knowledge of good hygiene of the respondents were unaware of the health implications of poor hand washing practices rather, they thought use of soap with water after defecation was a waste of time and monetary resources.

Few of the respondents wash their toilets when it's dirty and higher proportions were not satisfied with their current toilet standards. This is in contrast to studies conducted in Ethiopia and Alanamu, Nigeria where majority wash their latrine when it gets dirty³³, while others cleaned their toilets daily²⁹. Majority of the toilet facilities had doors, windows, and cemented floors but most of these toilet facilities had no removable covers, vent pipes and removable cover slabs. This finding was also observed in several studies conducted in Nigeria, Ghana and Ethiopia with intense odour and poor hygienic condition such as feaces on the floors and walls, flies around and within most of the toilet facilities lacks of water^{29,31,32}.

The association between level of education and practice of open defecation was statistically significant. Respondents who had higher level of education practiced less open defecation and this may be due to the fact that with more education individuals tend to know the implication of open defecation on health. A statistically significant association was made between level of income and type of toilet facility available in the home. With an increased level of income of respondents there was access to better toilet facilities and this may be as a result of higher economic status persons chose better type of toilet facilities. This finding was similar to several studies done in Nigeria, Ghana and Ethiopia showed higher economic status individuals had water closet in their houses^{24,2931,32}. The association between availability of toilet facilities and practice of open defecation was statistically significant. This was probably due to the fact that this study was done in semi urban and most of inhabitants were tenants and shared toilet facilities may lead to practice of open defecation however, long term practice of open defecation may continue as a habit even when improved toilet facilities are available. Therefore, creating public health awareness and environmental implication of this practice will be beneficial.

The association between proximity of water source and how often toilet was cleaned was also statistically significant as those who had water source within their toilet facilities washed their toilets more frequently than those that had theirs outside or distant source of water. This may be due inadequate water source in the community. Therefore, assess to improved toilet facility, adequate potable water supply and good hygiene practices are required minimized fecal-oral disease transmission thereby reducing morbidity and mortality rate and also increasing life expectancy of the nation.

References

- Evans, B. Securing sanitation: The compelling case to address the crisis, 2005. Available @: http://www.siwi.org/documents/Resources/Reports/CSD_Securing_Sanitation_2005.pdf. Accessed 29/6/2023.
- United Nations Development Programme (UNDP). Human Development Report: Beyond scarcity, power, poverty and the global water crisis, 2006. Available @: <http://hdr.undp.org/en/media/HDR06-complete.pdf>. Accessed 29/6/2023.
- Roma E, Buckley C, Jefferson B and Jeffrey P. Assessing users' experience of shared sanitation facilities. A case study of Community Ablution Blocks in Durban, South Africa. Water SA. 2010; 36(5) 589-594.
- Brocklehurst C. Water, Sanitation and hygiene: Foundations for development. Prepared for the High Level Expert Group Meeting The Global Water Crisis: Addressing Urgent Security Issues, InterAction Council, 2011. Available @: <https://www.interactioncouncil.org/sites/default/files/Clarissa%20Brocklehurst%20paper.pdf>. Accessed 29/6/2023.
- World health organisation (WHO): Diarrhoeal disease, 2017. Available @: <https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease>. Accessed 29/6/2023.
- Centre for disease control (CDC). Disease Threats and Global WASH Killers: Cholera, Typhoid, and Other Waterborne Infections, 2021. Available @: https://www.cdc.gov/healthywater/global/WASH.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhealthywater%2Fglobal%2Fdiarrhea-burden.html. Accessed 29/6/2023.
- WHO/UNICEF. We can't wait while 2.5 billion people don't have access to improved sanitation: World Toilet Day, 2014. Available @: <http://assemblyonline.info/opendefecationnigeria/>. Accessed 29/6/2023.
- United Nations International Children's Emergency Fund (UNICEF). Diarrhoea remains a leading killer of young children, despite the availability of a simple treatment solution, 2021. Available @: <https://data.unicef.org/topic/child-health/diarrhoeal-disease/>. Accessed 29/6/2023.
- United Nations International Children's Emergency Fund (UNICEF). Strategy for Water, Sanitation and Hygiene 2016–2030. Available @: <https://www.unicef.org/media/91266/file/UNICEF-Strategy-for-WASH-2016-2030.pdf>. Accessed 29/6/2023.
- Ezeh, O.K., Agho, K.E., Dibley, M.J., Hall, J. and Page, A.N (2014). The impact of water and sanitation on childhood mortality in Nigeria: Evidence from demographic and health surveys, 2003–2013. Int. J. Environ. Res. Public Health: 11: 9256-9272.
- The human rights to water and sanitation and the 2030 Agenda for Sustainable Development: The United Nations world water development report 2019: leaving no one behind, 2019. Available @: <https://unesdoc.unesco.org/ark:/48223/pf000367650>. Accessed 29/6/2023.
- Nigeria Demographic and Health Survey: Environmental Health - water, sanitation, 2020. Available @: <https://dhsprogram.com/methodology/survey-Types/dHs.cfm>. Accessed 30/6/2023.
- Uneze E, Tajudeen I and Iweala O. Cost-effectiveness and benefit-cost analyses of some water interventions in Nigeria: the case of Bauchi State. Journal of Development Effectiveness. 2012; 4(4):497-514.

14. Chukwuma BD, Anthony CI, Kevin CD and Kenechi AU. Environmental Sanitation Practices: A Case Study of Solid Waste Management in Semi-Urban Communities in Orlu, Imo State Nigeria. *Occupational Diseases and Environmental Medicine*, 2017; 5 (4) 134-67.
15. Ugboko HU, Nwinyi OC, Oranusi SU and Oyewale JO. Childhood diarrhoeal diseases in developing countries. *Heliyon*, 2020; 6 (4) 342-83. Available @ : <https://www.sciencedirect.com/science/article/pii/S2405844020305351>. Accessed 2/7/2023.
16. Jiwok JC, Adebawale AS, Wilson I. et al. Patterns of diarrhoeal disease among under-five children in Plateau State, Nigeria, 2013–2017. *BMC Public Health*, 2021. Available @ : <https://doi.org/10.1186/s12889-021-12110-y>. Accessed 9/7/2023.
17. Peter AK and Umar U. Combating diarrhoea in Nigeria: the way forward. *J Microbiol Exp.* 2018; 6(4):191-197.
18. Mami T, Kamrul I, Md Abu S, James AP and Md Taufiqul I. Etiology of Diarrhea Requiring Hospitalization in Bangladesh by Quantitative Polymerase Chain Reaction, 2014–2018. *Clinical Infectious Diseases*, 2021. 73 (9) 2493–2499.
19. World health organisation (WHO): Updates fact sheet on Diarrhoeal diseases, 2017. Available @ : <https://communitymedicine4all.com/2017/05/01/who-updates-fact-sheet-on-diarrhoeal-diseases-1-may-2017/>. Accessed 9/7/2023.
20. UNICEF/WHO. Progress on sanitation and drinking water. Update and MDG Assessment, 2015. Available @ : https://www.unicef.org/publications/index_82419.html. Accessed 9/7/2023.
21. World Health Organization (WHO). Sanitation: Fact Sheet;World Health Organization Media Centre, 2016 . Available @ : <http://www.who.int/mediacentre/factsheets/fs392/en/>. Accessed 2/6/2023.
22. Mills JE and Cumming O. The impact of water, sanitation and hygiene on key health and social outcomes: Review of evidence, 2016. Available @ : https://www.unicef.org/wash/files/The_Impact_of_WASH_on_Key_Social_and_Health_Outcomes_Review_of_Evidence.pdf. Accessed 2/7/2023.
23. Chinakwe EC, Nwogwugwu NW, Okorodudu S I, Onyemeraka N N and Ndubuisi-Nnaji UU. Microbial quality and public health implications of hand-wash water samples of Public Adults in Owerri, South-East Nigeria. *International Research Journal of Microbiology*, 2012;3(4), 144-146.
24. Ismaila RA. Access to Sanitation Facilities among Nigerian Households: Determinants and Sustainability. *Implications Sustainability*, 2017;9(547) 1-17.
25. Aluko OO, Afolabi OT, Olaoye EA, Adebayo AD, Oyetola SO and Abegunde OO. The management of the faeces passed by under five children: an exploratory, crosssectional research in an urban community in Southwest Nigeria. *BMC Public Health*, 2017; 17:178. 1-15.
26. Wolf J, Prüss-Ustün A, Cumming O, Bartram J, Bonjour S, Cairncross S, et al. Assessing the impact of drinking water and sanitation on diarrheal disease in low- and middle income settings: systematic review and meta-regression. *Tropical Med Int Health*. 2014;19(8):928–42.
27. Clasen TF, Alexander KT, Sinclair D, Boisson S, Peletz R, Chang HH, et al. Interventions to improve water quality for preventing diarrhea. *Cochrane Database Syst Rev*. 2015. Available @ : <https://doi.org/10.1002/14651858.CD004794.pub3>. Accessed 2/7/2023.
28. Ejemot-Nwadiaro RI, Ehiri JE, Arikpo D, Meremikwu MM and Critchley JA. Hand washing promotion for preventing diarrhea. *Cochrane Database Syst Rev*. 2015. Available @ : <https://doi.org/10.1002/14651858.CD004265.pub3>. Accessed 2/6/2023.
29. Olawoye RA. and Awoyeni AO. (2002). Availability and Utilization of Toilet Facilities in Ilorin, Nigeria *Sahel Medical Journal*, Vol. 5. No 4. 99-203.
30. Bizatu M and Negga, B. (2010). Community based assessment on household management of waste and hygiene practices in KersaWoreda, Eastern Ethiopia *Ethiop. J. Health Dev.* 24(2):103-109.
31. Asenso-Mensah E, Awoyemi AO and Browne ENL. (2006). The Influence Of Environmental Sanitation Practices And Hygiene On The Incidence Of Diarrhoea – The Case Of Koforidua Municipality, Ghana *Afr. J. Cln. Exper. Microbiol.* 10(1): 56 – 63.
32. Obeng PA, Keraita B, Oduro-Kwarteng S, Bregnhøj H, Abaidoo RC, Awuah E and Konradsen F. (2015). Usage and Barriers to Use of Latrines in a Ghanaian Peri-Urban Community. *Environ. Process.* 2:261–274.
33. Yimam TY, Kassahun AG, Daniel HC. (2013).Latrine utilization and associated factors among people living in rural areas of Denbia district, Northwest Ethiopia, 2013, a cross-sectional study *Pan African Medical Journal*. 2014; 18:334; 1-10.
34. Cairncross S, Hunt C, Boisson S, Bostoen K, Curtis V, Fung I. and Schmidt WP. (2010). Water, sanitation and hygiene for the prevention of diarrhoea. *International Journal of Epidemiology*. 39:(1): 193-205.
35. Coffey D, Gupta A, Hathi P, Khurana N, Srivastav N, Vyas S. and Spears D. (2014). Open

- defecation: evidence from a new survey in rural north India. *Econ. Political Wkly.* 49:43–55.
36. Coffey D, Gupta A, Hathi, P, Khurana N, Spears D, Srivastav N. and Vyas S. (2014). Revealed Preference for Open Defecation Evidence from a New Survey in Rural North India *Economic & Political Weekly EPW* september 20, 2014: vol xl ix, no 38; 43-55.
37. Hoque BA, Mahalanabis D, Alam MJ and Islam MIS (1995). Post-defecation Handwashing in Bangladesh: Practice and Efficiency Perspectives *Public Health* 109:15-24.