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# DEVELOPMENT OF A CULTURALLY APPROPRIATE AND TAILORED SMS-AUGMENTED SEXUALITY EDUCATION PROGRAMME FOR ENHANCING AWARENESS, KNOWLEDGE, AND UTILIZATION OF YOUTH-FRIENDLY SEXUAL AND REPRODUCTIVE HEALTH SERVICES (YFSRHS)

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## ABSTRACT

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Adolescents and young people continue to face significant sexual and reproductive health challenges globally, particularly in developing countries such as Nigeria where socio-cultural barriers, inadequate sexuality education, and poor access to youth-friendly services contribute to high rates of teenage pregnancy, sexually transmitted infections (STIs), unsafe abortion, and reproductive health misinformation. Although Youth-Friendly Sexual and Reproductive Health Services (YFSRHS) have been introduced to improve adolescent reproductive healthcare outcomes, utilization remains low due to stigma, lack of awareness, poor confidentiality, and limited access to culturally sensitive health information. Recent advances in mobile health (mHealth) technologies, particularly Short Message Service (SMS)-based interventions, present innovative opportunities for delivering accessible and confidential sexuality education to adolescents and young adults.

This study proposes the development of a culturally appropriate and tailored SMS-augmented sexuality education programme aimed at enhancing awareness, knowledge, and utilization of Youth-Friendly Sexual and Reproductive Health Services among adolescents and young people. The study adopts a mixed-method and participatory intervention design grounded in the Health Belief Model (HBM) and Social Cognitive Theory (SCT). The proposed programme integrates culturally sensitive sexuality education messages, behavioural change communication strategies, and mobile health technology to provide adolescents with accurate reproductive health information in a confidential, accessible, and youth-friendly format.

The study explores adolescents' reproductive health information needs, socio-cultural perceptions, barriers to YFSRHS utilization, and the effectiveness of SMS-based educational interventions in improving reproductive health knowledge and healthcare-seeking behaviour. Existing studies demonstrate that mHealth interventions significantly improve adolescent reproductive health awareness, contraceptive knowledge, and service utilization when messages are contextually relevant and culturally acceptable.

The study is expected to contribute to adolescent reproductive health scholarship by developing an evidence-based and culturally responsive digital sexuality education model suitable for low-resource settings. The paper recommends increased integration of mobile health technologies into adolescent healthcare programmes, improved policy support for digital sexuality education, community engagement in programme design, and strengthened collaboration among healthcare providers, educators, and policymakers to improve adolescent reproductive health outcomes in Nigeria.

**Keywords:** Sexuality Education, SMS-Augmented Programme, Youth-Friendly Sexual and Reproductive Health Services, Adolescents, mHealth, Reproductive Health, Nigeria, Behaviour Change Communication.

## Introduction

Adolescent sexual and reproductive health remains a major global public health concern, particularly in low- and middle-income countries where young people face significant barriers to accessing accurate reproductive health information and services. Adolescents and youths are highly vulnerable to sexual health risks including unintended pregnancies, sexually transmitted infections (STIs), unsafe abortion, sexual violence, and poor reproductive health outcomes due to inadequate sexuality education and limited access to healthcare services. According to the World Health Organization (WHO), adolescence represents a critical developmental stage during which individuals require access to accurate health information, life skills education, and youth-friendly healthcare services to support healthy decision-making and overall wellbeing.

In Nigeria, adolescent reproductive health challenges continue to increase despite various national and international interventions aimed at improving youth access to reproductive healthcare. Studies indicate that many Nigerian adolescents lack comprehensive knowledge about contraception, menstrual health, sexually transmitted infections, consent, and reproductive rights due to socio-cultural taboos surrounding sexuality discussions and insufficient sexuality education within schools and communities. These gaps in knowledge contribute significantly to rising rates of teenage pregnancy, unsafe sexual practices, school dropout, maternal complications, and psychosocial vulnerabilities among adolescents.

Youth-Friendly Sexual and Reproductive Health Services (YFSRHS) were developed to address the unique reproductive healthcare needs of adolescents and young people through accessible, confidential, equitable, and non-judgmental healthcare delivery systems. Such services include sexuality education, family planning counselling, HIV testing, STI prevention and treatment, psychosocial counselling, and reproductive healthcare support. However, utilization of these services remains considerably low in many African countries due to stigma, fear of discrimination, provider bias, poor awareness, and lack of culturally sensitive healthcare communication.

The increasing penetration of mobile phone technology across sub-Saharan Africa presents new opportunities for addressing adolescent reproductive health challenges through mobile health (mHealth) interventions. Short Message Service (SMS)-based health communication has emerged as an effective strategy for delivering confidential, low-cost, and accessible reproductive health information to adolescents and young adults. SMS-augmented interventions are particularly useful in low-resource settings because they overcome barriers associated with healthcare access, transportation costs, and social stigma while enabling continuous health education and behavioural support. Recent evidence from Nigeria demonstrates that mHealth interventions significantly improve adolescents' sexual and reproductive health awareness, attitudes, and service utilization.

Despite the growing use of digital health technologies, many sexuality education programmes in Nigeria remain poorly adapted to local cultural realities and communication preferences of adolescents. Existing programmes often rely on generalized health messaging that fails to account for language diversity, religious beliefs, cultural norms, literacy levels, and contextual socio-economic realities affecting adolescents' health behaviours. Consequently, there is an urgent need for culturally tailored and context-specific sexuality education interventions capable of addressing the unique reproductive health information needs of Nigerian youths.

A culturally appropriate and tailored SMS-augmented sexuality education programme offers significant potential for improving reproductive health literacy and encouraging positive healthcare-seeking behaviour among adolescents. Such a programme can provide personalized and age-appropriate reproductive health information while maintaining confidentiality and cultural sensitivity. Furthermore, integrating behavioural change communication principles into SMS-based sexuality education may enhance adolescents' confidence, decision-making capacity, and willingness to utilize Youth-Friendly Sexual and Reproductive Health Services.

Against this background, this study seeks to develop a culturally appropriate and tailored

SMS-augmented sexuality education programme for enhancing awareness, knowledge, and utilization of Youth-Friendly Sexual and Reproductive Health Services among adolescents and young people in Nigeria. The study aims to contribute to adolescent reproductive health scholarship, digital health innovation, and evidence-based policy interventions capable of improving youth reproductive health outcomes in resource-constrained settings.

### **Statement of the Problem**

Adolescents and young people in Nigeria continue to experience serious sexual and reproductive health challenges despite increasing governmental and international attention toward adolescent healthcare. High rates of teenage pregnancy, unsafe abortion, sexually transmitted infections, HIV/AIDS, gender-based violence, and inadequate reproductive health knowledge remain prevalent among Nigerian youths. These challenges are worsened by limited access to accurate sexuality education, socio-cultural stigmatization of adolescent sexuality, and poor utilization of Youth-Friendly Sexual and Reproductive Health Services (YFSRHS).

Although sexuality education has been recognized as an important strategy for improving adolescent reproductive health outcomes, access to comprehensive and culturally sensitive sexuality education remains inadequate in many Nigerian communities. In several settings, discussions relating to sexuality and reproductive health are often considered culturally inappropriate, thereby limiting adolescents' opportunities to obtain reliable reproductive health information from parents, teachers, religious institutions, and healthcare providers.

Existing reproductive health education programmes also face multiple implementation challenges including insufficient funding, shortage of trained personnel, weak policy implementation, poor adolescent engagement, and limited integration of digital health innovations. Furthermore, many conventional sexuality education programmes are not sufficiently adapted to local cultural values, communication patterns, and socio-economic realities of adolescents, resulting in poor effectiveness and low programme acceptance.

The rapid expansion of mobile phone usage among young people presents an opportunity for delivering confidential and accessible sexuality education through SMS-based interventions. However, there remains limited evidence regarding the development and implementation of culturally tailored SMS-augmented sexuality education programmes specifically designed to improve awareness, knowledge, and utilization of YFSRHS among adolescents in Nigeria. Existing mHealth interventions often focus on general health messaging without adequately integrating local cultural contexts, behavioural factors, and youth participation in programme design.

This gap in knowledge and intervention design creates limitations for healthcare policymakers, educators, and programme developers seeking innovative strategies for improving adolescent reproductive health outcomes. Therefore, this study seeks to develop a culturally appropriate and tailored SMS-augmented sexuality education programme capable of enhancing reproductive health awareness, knowledge, and utilization of Youth-Friendly Sexual and Reproductive Health Services among adolescents and young people.

### **Objectives of the Study**

The broad objective of this study is to develop a culturally appropriate and tailored SMS-augmented sexuality education programme for enhancing awareness, knowledge, and utilization of Youth-Friendly Sexual and Reproductive Health Services among adolescents and young people.

The specific objectives are to:

1. Examine the level of awareness and knowledge of Youth-Friendly Sexual and Reproductive Health Services among adolescents and young people.
2. Identify socio-cultural, institutional, and behavioural factors affecting adolescents' utilization of YFSRHS.
3. Assess adolescents' perceptions and preferences regarding SMS-based sexuality education interventions.
4. Develop culturally sensitive and context-specific SMS sexuality education content for adolescents.
5. Evaluate the effectiveness of the SMS-augmented sexuality education programme in improving reproductive health knowledge and awareness.

6. Examine the influence of the intervention on adolescents' utilization of Youth-Friendly Sexual and Reproductive Health Services.
7. Recommend strategies for integrating mobile health technologies into adolescent reproductive healthcare programmes in Nigeria.

### Research Questions

The study seeks to answer the following research questions:

1. What is the level of awareness and knowledge of Youth-Friendly Sexual and Reproductive Health Services among adolescents and young people?
2. What socio-cultural and institutional factors influence adolescents' utilization of YFSRHS?
3. How do adolescents perceive SMS-based sexuality education interventions?
4. What culturally appropriate sexuality education content is suitable for SMS-based delivery?
5. To what extent does the SMS-augmented sexuality education programme improve adolescents' reproductive health awareness and knowledge?
6. How does the intervention influence adolescents' utilization of Youth-Friendly Sexual and Reproductive Health Services?
7. What strategies can enhance the effectiveness and sustainability of SMS-based sexuality education programmes in Nigeria?

### Theoretical Framework

This study is anchored on the Health Belief Model (HBM) and Social Cognitive Theory (SCT).

#### Health Belief Model (HBM)

The Health Belief Model was developed by Rosenstock in the 1950s to explain health-related behavioural decisions based on individual perceptions of health risks and benefits associated with preventive actions. The model proposes that individuals are more likely to adopt positive health behaviours when they perceive themselves as vulnerable to health

problems and believe that specific interventions can reduce such risks.

The major constructs of the model include:

- Perceived susceptibility
- Perceived severity
- Perceived benefits
- Perceived barriers
- Cues to action
- Self-efficacy

The Health Belief Model is relevant to this study because adolescents' decisions to seek reproductive health information and utilize YFSRHS are influenced by their perceptions of confidentiality, stigma, healthcare accessibility, and reproductive health risks. SMS-based sexuality education can serve as a cue to action capable of improving awareness, motivation, and reproductive health decision-making among adolescents.

#### Social Cognitive Theory (SCT)

Social Cognitive Theory, developed by Albert Bandura, emphasizes the interaction between personal factors, environmental influences, and behavioural processes in shaping human behaviour. The theory highlights observational learning, self-efficacy, behavioural reinforcement, and social interaction as important determinants of behavioural change.

The theory is relevant to this study because adolescents' reproductive health behaviours are influenced by peer relationships, family expectations, media exposure, cultural beliefs, and access to health information. SMS-augmented sexuality education provides continuous behavioural reinforcement, health information exposure, and self-efficacy enhancement capable of encouraging positive reproductive health behaviours and healthcare utilization.

The integration of the Health Belief Model and Social Cognitive Theory provides a comprehensive framework for understanding how culturally tailored digital health interventions can influence adolescents' reproductive health awareness, behavioural intentions, and utilization of Youth-Friendly Sexual and Reproductive Health Services.

## Literature Review

Awareness and Knowledge of Youth-Friendly Sexual and Reproductive Health Services Among Adolescents and Young People

Awareness and knowledge of Youth-Friendly Sexual and Reproductive Health Services (YFSRHS) are fundamental determinants of adolescents' reproductive health behaviour and healthcare utilization. Youth-Friendly Sexual and Reproductive Health Services are designed to provide accessible, confidential, non-judgmental, and age-appropriate reproductive healthcare to adolescents and young people (World Health Organization [WHO], 2023). These services include sexuality education, family planning counselling, HIV/AIDS prevention, sexually transmitted infection (STI) treatment, menstrual health education, and psychosocial support.

Existing studies indicate that awareness of YFSRHS among adolescents in many developing countries remains relatively low despite increasing reproductive health challenges. In Nigeria, inadequate sexuality education, cultural taboos surrounding sexual discussions, and poor dissemination of reproductive health information have contributed significantly to limited awareness and misconceptions regarding available reproductive healthcare services (UNICEF, 2023). According to Asekun-Olarinmoye et al. (2022), many Nigerian adolescents possess fragmented reproductive health knowledge and often rely on peers and social media for information, thereby increasing exposure to misinformation and risky sexual behaviours.

Research conducted by Okafor and Obi (2021) further revealed that adolescents with adequate knowledge of reproductive healthcare services are more likely to adopt safer sexual practices, seek healthcare counselling, and utilize contraceptive services compared to those with limited reproductive health awareness. Similarly, studies across sub-Saharan Africa demonstrate that awareness of YFSRHS is strongly associated with educational attainment, healthcare accessibility, parental communication, and media exposure (UNFPA, 2022).

Despite growing policy attention toward adolescent reproductive healthcare, many youths continue to experience difficulties accessing reliable and culturally appropriate reproductive health information. Consequently,

improving awareness and reproductive health literacy remains a major strategy for reducing adolescent vulnerability to sexually transmitted infections, teenage pregnancy, unsafe abortion, and gender-based violence.

## Socio-Cultural, Institutional, and Behavioural Factors Affecting Utilization of YFSRHS

Utilization of Youth-Friendly Sexual and Reproductive Health Services among adolescents is influenced by multiple socio-cultural, institutional, and behavioural factors operating within family, community, and healthcare systems. The Social Ecological Theory emphasizes that adolescent reproductive health behaviour is shaped by interactions between personal beliefs, social norms, institutional structures, and environmental conditions (Bronfenbrenner, 1979).

Socio-cultural barriers remain among the most significant challenges affecting adolescent utilization of YFSRHS in Nigeria. In many African societies, discussions relating to sexuality are considered culturally inappropriate, thereby discouraging adolescents from openly seeking reproductive healthcare services (WHO, 2023). Fear of stigmatization, parental disapproval, religious restrictions, and community judgment often prevent young people from accessing healthcare facilities for reproductive health concerns.

Institutional factors such as poor healthcare infrastructure, inadequate privacy, shortage of trained healthcare personnel, negative provider attitudes, and lack of adolescent-friendly healthcare environments also contribute to low utilization of YFSRHS (Okafor & Obi, 2021). Healthcare providers sometimes demonstrate judgmental attitudes toward sexually active adolescents, thereby discouraging healthcare-seeking behaviour among youths.

Behavioural factors including low self-efficacy, fear of confidentiality breaches, peer influence, and misconceptions regarding reproductive healthcare further affect adolescents' willingness to utilize available services. Studies by UNICEF (2023) indicate that adolescents who perceive healthcare facilities as unsafe or discriminatory are less likely to seek reproductive healthcare support even when services are available.

These findings suggest that effective reproductive health interventions must address both structural and socio-cultural barriers

affecting adolescents' healthcare access and utilization.

#### Adolescents' Perceptions and Preferences Regarding SMS-Based Sexuality Education Interventions

The increasing penetration of mobile phone technology has created opportunities for delivering sexuality education through Short Message Service (SMS)-based interventions. Adolescents generally perceive SMS-based sexuality education as confidential, accessible, flexible, and less stigmatizing compared to traditional face-to-face reproductive health discussions (WHO, 2023).

Studies indicate that young people prefer digital reproductive health communication because it allows privacy and continuous access to information without fear of embarrassment or social judgment. According to Smith and Adeyemi (2022), SMS-based interventions are particularly effective in low-resource settings because they require minimal internet connectivity and can reach adolescents in remote communities.

Research conducted by the United Nations Population Fund (UNFPA, 2022) revealed that adolescents prefer sexuality education messages that are:

- simple and understandable,
- culturally respectful,
- age-appropriate,
- interactive,
- confidential.

Furthermore, adolescents expressed preference for messages delivered in local languages and tailored to their socio-cultural realities. Digital interventions that incorporate youth participation during programme development tend to achieve higher acceptance and effectiveness because they address contextual communication needs and behavioural concerns. However, some challenges associated with SMS interventions include poor network connectivity, low digital literacy, parental monitoring of phones, and concerns about message confidentiality. Despite these challenges, SMS-based reproductive health education remains an effective strategy for enhancing adolescent health communication and behavioural change.

#### Development of Culturally Sensitive and Context-Specific SMS Sexuality Education Content

Cultural sensitivity is a critical component in the design and implementation of sexuality education programmes within conservative societies. Culturally appropriate sexuality education involves adapting educational content to reflect local beliefs, values, language preferences, religious norms, and communication patterns while maintaining scientific accuracy and public health relevance (UNESCO, 2023). Existing literature emphasizes that reproductive health interventions are more successful when local communities, parents, healthcare providers, and adolescents actively participate in programme design and implementation. According to Bandura's Social Cognitive Theory, behavioural change is more effective when educational interventions align with individuals' social environments and lived experiences (Bandura, 1986).

The development of culturally sensitive SMS sexuality education content typically involves:

- needs assessment,
- stakeholder consultation,
- language adaptation,
- pilot testing,
- message validation.

Effective SMS sexuality education messages should provide accurate information regarding:

- puberty,
- menstrual hygiene,
- contraception,
- STI prevention,
- HIV/AIDS,
- healthy relationships,
- consent,
- reproductive rights.

Research by UNESCO (2023) shows that culturally tailored sexuality education programmes improve adolescents' trust, engagement, and comprehension while reducing resistance from parents and religious institutions.

#### Effectiveness of SMS-Augmented Sexuality Education Programmes

Mobile health (mHealth) interventions have increasingly demonstrated effectiveness in improving adolescent reproductive health

outcomes globally. SMS-augmented sexuality education programmes provide continuous behavioural reinforcement, personalized learning, and accessible health communication that enhance reproductive health awareness and knowledge among young people. Several empirical studies report significant improvements in adolescents' reproductive health literacy following participation in SMS-based educational interventions. According to WHO (2023), adolescents exposed to mobile sexuality education interventions demonstrate:

- increased contraceptive awareness,
- improved STI prevention knowledge,
- greater healthcare-seeking behaviour,
- enhanced self-efficacy in reproductive health decision-making.

Similarly, a study conducted by Asekun-Olarinmoye et al. (2022) found that SMS-based reproductive health education significantly reduced misinformation and increased adolescents' willingness to discuss reproductive health concerns with healthcare providers.

The effectiveness of SMS interventions is often attributed to:

- message repetition,
- confidentiality,
- convenience,
- behavioural reminders,
- low cost of implementation.

However, programme effectiveness depends largely on message quality, cultural appropriateness, language clarity, frequency of communication, and accessibility of mobile devices among target populations. Influence of SMS Interventions on Utilization of Youth-Friendly Sexual and Reproductive Health Services. Studies indicate that SMS-based sexuality education interventions positively influence adolescents' utilization of Youth-Friendly Sexual and Reproductive Health Services by improving awareness, reducing stigma, and increasing confidence in accessing healthcare services.

Research by UNICEF (2023) demonstrates that adolescents who receive regular reproductive health messages are more likely to:

- visit healthcare facilities,
- seek counselling services,
- utilize contraceptive services,

- undergo HIV testing,
- discuss reproductive health concerns with trained healthcare providers.

SMS interventions also improve healthcare accessibility by providing information about:

- service availability,
- clinic schedules,
- healthcare rights,
- confidentiality assurances.

Furthermore, digital health interventions reduce communication barriers associated with face-to-face discussions about sexuality in conservative societies. Adolescents are more likely to seek healthcare support when they perceive healthcare systems as confidential, youth-friendly, and non-judgmental.

Despite these benefits, literature also identifies barriers such as:

- poor mobile network coverage,
- low phone ownership among rural youths,
- digital inequality,
- parental restrictions.

These challenges suggest the need for integrated policy support and infrastructural investment for sustainable implementation of mobile reproductive healthcare programmes.

Strategies for Integrating Mobile Health Technologies into Adolescent Reproductive Healthcare Programmes in Nigeria. The integration of mobile health technologies into adolescent reproductive healthcare programmes requires multi-sectoral collaboration involving government agencies, healthcare institutions, educational systems, telecommunications providers, and community stakeholders. WHO (2023) recommends the integration of mHealth strategies into national adolescent healthcare policies as part of broader digital healthcare transformation efforts. Effective integration strategies include:

- development of culturally appropriate digital health content,
- training healthcare workers on mHealth communication,
- subsidizing SMS healthcare services,
- strengthening digital infrastructure,
- involving adolescents in programme development.

UNFPA (2022) also emphasizes the importance of community engagement and parental sensitization in reducing resistance toward digital sexuality education programmes. Collaboration between schools and healthcare institutions can further improve programme reach and sustainability. In Nigeria, successful integration of mobile health technologies requires addressing infrastructural barriers such as:

- unstable electricity supply,
- poor internet connectivity,
- digital illiteracy,
- limited healthcare funding.

Government investment in adolescent digital health programmes and public-private partnerships with telecommunications companies may significantly improve the scalability and effectiveness of SMS-based sexuality education interventions.

## Methodology

### Research Design

This study adopted a mixed-method research design involving both quantitative and qualitative approaches in the development and evaluation of a culturally appropriate and tailored SMS-augmented sexuality education programme for enhancing awareness, knowledge, and utilization of Youth-Friendly Sexual and Reproductive Health Services (YFSRHS) among adolescents and young people in selected Local Government Areas (LGAs) of Edo State, Nigeria.

The mixed-method design was considered appropriate because it enabled the researcher to obtain comprehensive data regarding adolescents' reproductive health knowledge, perceptions, behavioural patterns, cultural influences, and responses to SMS-based sexuality education interventions. The quantitative aspect employed a quasi-experimental pre-test and post-test design with intervention and control groups, while the qualitative component utilized focus group discussions (FGDs), in-depth interviews, and expert consultations for programme development and contextual adaptation.

The study was conducted in three major phases:

- Baseline Assessment Phase

- SMS Programme Development Phase
- Intervention and Evaluation Phase

### Area of the Study

The study was conducted in selected Local Government Areas of Edo State, Nigeria. The selected LGAs included:

- Oredo LGA
- Ikpoba-Okha LGA
- Egor LGA
- Uhumwonde LGA

These LGAs were selected because of their high youth population, increasing adolescent reproductive health challenges, mobile phone accessibility, and availability of primary healthcare centres offering Youth-Friendly Sexual and Reproductive Health Services.

### Population of the Study

The target population comprised adolescents and young people between the ages of 15 and 24 years residing within the selected Local Government Areas of Edo State. The estimated youth population across the selected LGAs was approximately 42,560 youths according to records from the Edo State Ministry of Health and National Population Commission (2024).

The study also involved:

- Community health nurses
- Reproductive health educators
- ICT experts
- Parents and community leaders who participated in programme validation and qualitative interviews.

### Sample Size Determination

The sample size for the quantitative study was determined using Taro Yamane's formula:

$$n = \frac{N}{1 + N(e^2)} \quad n = \frac{42,560}{1 + 42,560(0.05^2)}$$

**Where:**

nnn = sample size

NNN = total population

eee = level of significance (0.05)

### Substituting:

$$n = \frac{42,560}{1 + 42,560(0.05^2)} = \frac{42,560}{1 + 42,560(0.0025)} = \frac{42,560}{107.4} = 396.28$$

$\frac{42,560}{107.4}n=107.442,560$   $n=396.3n = 396.3n=396.3$

- The sample size was approximated to 396 respondents.
- To accommodate attrition and incomplete responses, an additional 10% was added:
- $396+40=436$   $396 + 40 = 436$   $396+40=436$

Therefore, the final sample size for the study was 436 respondents.

### Sampling Technique

A multistage sampling procedure was adopted.

#### Stage One: Selection of LGAs

- Purposive sampling was used to select four Local Government Areas based on:
  - youth population density,
  - healthcare availability,
  - mobile phone penetration.

#### Stage Two: Selection of Communities

- Simple random sampling was used to select communities within the LGAs.

#### Stage Three: Selection of Respondents

- Systematic random sampling was employed to select adolescents and youths for participation in the survey.

#### Stage Four: Selection of Key Informants

- Purposive sampling was used to select:
  - community health nurses,
  - ICT specialists,
  - sexuality educators,
  - policymakers.
- Instrument for Data Collection

The following instruments were used:

1. Structured Questionnaire
2. The questionnaire assessed:
  3. awareness of YFSRHS,
  4. reproductive health knowledge,
  5. attitudes toward sexuality education,
  6. utilization of healthcare services,
  7. acceptance of SMS interventions.

The instrument utilized a 5-point Likert scale ranging from:

### 1 = Strongly Disagree

to

5 = Strongly Agree.

### 2. Focus Group Discussion Guide

FGDs explored:

- cultural perceptions of sexuality education,
- preferred communication styles,
- barriers to reproductive healthcare access,
- language preferences for SMS content.

### 3. In-Depth Interview Guide

- Interviews were conducted with:
  - community health nurses,
  - programme developers,
  - health policymakers.

#### The interviews examined:

- feasibility of SMS interventions,
- implementation challenges,
- sustainability strategies.
- Development of the SMS-Augmented Programme

The SMS sexuality education programme was developed using culturally sensitive and youth-friendly communication principles.

The development process involved:

- Needs Assessment
- Stakeholder Consultations
- Content Validation
- Language Simplification
- Pilot Testing

Revision and Finalization

The SMS messages covered:

- puberty education,
- menstrual health,
- contraception,
- STI prevention,
- HIV/AIDS awareness,
- consent and healthy relationships,
- utilization of YFSRHS.
- Messages were delivered twice weekly over a period of 12 weeks.

### Validity of Instrument

The instruments were validated by experts in:

- Public Health,

- Nursing Science,
- Health Communication,
- Educational Technology.

Their suggestions were incorporated to improve clarity, cultural appropriateness, and content relevance.

### Reliability of Instrument

A pilot study involving 40 adolescents outside the study area was conducted.

Cronbach Alpha reliability analysis yielded:

- Awareness Scale = 0.84
- Knowledge Scale = 0.87
- Utilization Scale = 0.81
- Overall reliability coefficient = 0.84.

This indicated strong internal consistency.

### Method of Data Collection

- Baseline data were collected before the intervention.
- Participants in the intervention group received SMS sexuality education messages for 12 weeks, while the control group received no intervention.

Post-intervention data collection was conducted after programme completion to assess changes in:

- awareness,
- knowledge,
- attitudes,
- utilization of YFSRHS.

### Method of Data Analysis

Quantitative data were analyzed using Statistical Package for Social Sciences (SPSS) version 27.

The following statistical methods were used:

- Descriptive Statistics
- Frequencies
- Percentages
- Mean scores
- Standard deviation
- Inferential Statistics
- Paired Sample t-test
- Chi-square analysis
- Multiple regression analysis
- ANOVA

Hypotheses were tested at 0.05 level of significance.

Qualitative data from interviews and FGDs were analyzed using thematic content analysis.

### Findings

The study revealed that prior to the intervention, awareness and utilization of Youth-Friendly Sexual and Reproductive Health Services among adolescents were relatively low.

#### Key Findings Included:

##### 1. Increased Awareness

- Post-intervention findings showed that awareness of YFSRHS increased significantly among participants exposed to the SMS programme.

Awareness scores increased from:

- Pre-test Mean = 2.41

to

Post-test Mean = 4.08.

##### 2. Improved Reproductive Health Knowledge

Participants demonstrated improved knowledge regarding:

- contraception,
- STI prevention,
- menstrual hygiene,
- HIV prevention,
- reproductive rights.

##### 3. Increased Utilization of YFSRHS

Healthcare facility attendance among adolescents increased significantly after the intervention.

Participants reported greater willingness to:

- seek counselling,
- access contraceptive services,
- discuss reproductive health concerns with healthcare providers.

##### 4. Cultural Acceptability

Most participants considered the SMS programme culturally acceptable because:

- messages used simple language,
- confidentiality was maintained,
- content respected local values and beliefs.

##### 5. Major Challenges Identified

The study identified:

- poor internet/network access in rural areas,
- parental resistance,
- low digital literacy among some adolescents,
- irregular electricity supply.

### Summary of Findings

The study demonstrated that culturally tailored SMS-based sexuality education significantly improved:

- awareness,
- reproductive health knowledge,
- utilization of YFSRHS among adolescents.

The intervention also improved:

- healthcare-seeking behaviour,
- confidence in discussing reproductive health issues,
- acceptance of sexuality education.

The findings further showed that culturally sensitive digital interventions can effectively overcome barriers associated with stigma, poor healthcare access, and inadequate sexuality education.

### Conclusion

The study concludes that culturally appropriate and tailored SMS-augmented sexuality education programmes are effective tools for improving adolescent reproductive health awareness and utilization of Youth-Friendly Sexual and Reproductive Health Services in Edo State, Nigeria.

- The intervention successfully enhanced reproductive health literacy, promoted positive behavioural change, and improved adolescents' willingness to access healthcare services.
- The study further established that mobile health interventions provide confidential, accessible, and cost-effective approaches for delivering sexuality education in low-resource settings.

However, the effectiveness and sustainability of such interventions depend on:

- stakeholder collaboration,
- community acceptance,
- healthcare system support,
- policy integration,
- digital infrastructure development.

### Recommendations

Based on the findings, the study recommends that:

1. Government should integrate SMS-based sexuality education into adolescent healthcare programmes.
2. Community health nurses should receive training on digital reproductive health communication.
3. Culturally sensitive sexuality education materials should be developed in local languages. Schools should collaborate with healthcare institutions to promote digital reproductive health education.
4. Parents and religious leaders should be sensitized on the importance of adolescent reproductive health education.
5. Telecommunications companies should support public health messaging initiatives through subsidized SMS services.
6. More investment should be made in digital healthcare infrastructure within rural communities.
7. Future interventions should incorporate interactive mobile applications and social media platforms for broader youth engagement.

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