TITLE: KNOWLEDGE OF CERVICAL CANCER AND ASSESSMENT OF RISK FACTORS AMONG PREGNANT AND POSTPARTUM WOMEN IN SUB-SAHARAN AFRICA

AUTHORS: Rukiyat A. ABDUS-SALAM[*], Rasheedat O. BALOGUN[*], Abbas A. ABDUS-SALAM[†]

AFFILIATION:
[*] Department of Obstetrics and Gynaecology, Faculty of Clinical Sciences, College of Medicine, University of Ibadan/ University College Hospital, Ibadan, Oyo State, Nigeria.
[†] Department of Radiation Oncology, Faculty of Clinical Sciences, College of Medicine, University of Ibadan/ University College Hospital, Ibadan, Oyo State, Nigeria.

AUTHORS:
Rukiyat A. Abdus-Salam
Department of Obstetrics and Gynaecology,
Faculty of Clinical Sciences, College of Medicine,
University of Ibadan, Ibadan,
Oyo State, Nigeria
Email: deolaabdussalam@gmail.com
ORCID NUMBER: https://orcid.org/0000-0002-2226-0597

Rasheedat O. BALOGUN
Department of Obstetrics and Gynaecology,
Faculty of Clinical Sciences, College of Medicine,
University of Ibadan, Ibadan,
Oyo State, Nigeria
Email: rasheedatomololabalogun@gmail.com
ORCID number: https://orcid.org/0000-0003-3076-8937

Abbas A. Abdus-Salam
Department of Radiation Oncology,
Faculty of Clinical Sciences, College of Medicine,
University of Ibadan, Ibadan,
Oyo State, Nigeria
Email: adrusa@gmail.com
ORCID number: https://orcid.org/0000-0003-0148-9752

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CORRESPONDING AUTHOR:
Rasheedat O. BALOGUN
Department of Obstetrics and Gynaecology,
Faculty of Clinical Sciences, College of Medicine,
University of Ibadan, Ibadan,
Oyo State, Nigeria
Email: rasheedatomololabalogun@gmail.com
Telephone: +2348020717726
ORCID number: https://orcid.org/0000-0003-3076-8937
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Essentials:

- Cervical cancer in Nigeria presents in advanced stages due to poor awareness of screening
- This was a cross-sectional study conducted at the University College Hospital, Ibadan
- >1 in 5 women were not aware. Age and education level were independently associated with awareness.
- Multiple sexual partners and poor condom use were the commonest identifiable risk factors.

KNOWLEDGE OF CERVICAL CANCER AND ASSESSMENT OF RISK FACTORS AMONG PREGNANT AND POSTPARTUM WOMEN IN SOUTH-WEST NIGERIA

Abstract:
Background: Most cases of cervical cancer in Nigeria present in advanced stages due to poor awareness of the disease and available screening modalities. The pre- and postnatal periods may be opportunities to see women of childbearing age, raise awareness, and identify high-risk factors.
Objective: To assess awareness of cervical cancer, associated factors, and risk factor assessment in pregnant and postpartum women.
Methods: This cross-sectional study was conducted at the University College Hospital, Ibadan; 220 consenting women were interviewed. The data obtained included sociodemographic and obstetric characteristics, awareness of cervical cancer, and its risk factors. Data was analysed using SPSS version 25; level of significance $p<0.05$.
Result: Mean age was 31.15±5.39 years. Forty-nine (22.3%) women had never heard of cervical cancer. Age ($p<0.0001$), occupation($p=0.01$), education level ($p<0.000$), and religion ($p=0.01$), were associated with awareness. Younger age and lower educational level were independent predictors of awareness. Multiple sexual partners and poor condom use were the commonest identifiable risk factors.

Conclusion: More than 1 in 5 women were not aware of cervical cancer. Age and education level were independently associated with the level of awareness. To reduce the burden, interventions to prevent cervical cancer should include awareness and screening at maternal health clinics.

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INTRODUCTION:

Cervical cancer is preventable; however, the majority of the cases in developing countries present in advanced stages due to poor awareness, knowledge and uptake of routine screening for the pre-invasive lesions of the cervix uteri in the low- and middle-income countries. Cervical cancer is the fourth most common cancer of the female worldwide after breast, colorectal and lung cancers.[1] Breast and cervical cancers[2 account for more than 40% of all cancer cases and about two-thirds of cancer deaths.[3],[4]

There is a growing cancer burden in sub-Saharan Africa (SSA), Central America and South-East Asia with increasing cancer incidence and death.[1] It was projected that there would be a major increase in cancer mortality from 520,348 in 2020 to about 1 million deaths per year by the year 2030 if urgent action is not taken.[2 In Nigeria, cervical cancer is the second most common cancer; a leading cause of cancer-related admissions,5],[6] and the second most frequent cause of cancer-related death among women between 15 and 44years of age.[7] There are about 12,000 women diagnosed and about 8,000 deaths from cervical cancer every year in Nigeria.[8] In 2022, there were 13,676 new cases and 7,093 deaths from cervical cancer in Nigeria.[9] While there is a decrease in cervical cancer cases in the developed world, cervical cancer remains a burden on developing countries, where the risk of cervical cancer is 35% greater than in developed countries.[10]

Despite the burden of cervical cancer in Nigeria, the awareness of cervical cancer and screening remains low. Previous studies assessing the level of awareness in Nigeria have reported varying results depending on the population studied. Many studies have demonstrated a disconnect between awareness, knowledge of cervical cancer and the awareness of cervical cancer screening, perception, uptake and practice. The awareness of cervical cancer and/or screening remains poor.[11–15]. A study done in Lagos, Nigeria, showed that about 15% of the respondents had knowledge of cervical cancer screening, but less than 5% of these women had ever had a Pap smear.[16]. In a similar study in Enugu, Nigeria, only 23% of the female respondents knew that a Pap smear is a screening test for the disease, and only about 5.2% of them had ever utilised it[17]. Another study in Ogun, Nigeria, found that 22.8% of respondents were aware of cervical cancer screening, but uptake was low, uptake of 6.49%.[18] These studies highlight the poor uptake of cervical cancer screening in Nigeria.

Pregnant women, just like their non-pregnant counterparts, have poor awareness, knowledge and practice of cervical cancer screening. Culture, religion, and socioeconomic status affect the health-seeking behaviours of women[11,12]. Other factors, such as social stigma, cost, women's worry about discomfort from examination, fear of finding cancer, inability to establish effective follow-up treatment, and access to services, may contribute to the underutilization of screening[10,19]. The risk factors for cervical cancer include multiple sexual partners, partners with multiple sexual partners, human papilloma virus (HPV) infection, sexually transmitted infection, early coitarche, early marriage, cigarette smoking, oral contraceptive use, and Human Immunodeficiency virus (HIV) infection.[20,21]

To reduce the burden of disease, awareness, knowledge, and the utilisation of prevention strategies and screening must improve by intensifying awareness campaigns and exploring other channels to increase coverage. Antenatal and postnatal care services are preventive maternal health services that support the early detection and treatment of diseases in pregnant and postpartum women. Antenatal care coverage in Nigeria has been fairly stable, with a high proportion of women accessing the service.[22]

This study assessed cervical cancer awareness, knowledge of aetiology, and risk factors among pregnant and postpartum women.

METHODS:

This study was approved by the University of Ibadan/University College Hospital, Ibadan, Ethics review committee with ethical approval number UI/EC/20/0265.

A cross-sectional study was conducted among pregnant and postpartum women attending antenatal and postnatal care clinics at the University College Hospital (UCH), Ibadan. A cross-sectional study was employed because it provided an efficient means of gathering a snapshot of relevant data from a large population of women at a single point in time. All women accessing maternal health services - antenatal and postnatal care at the obstetric unit of the UCH were invited to take part in the study. Participants were counselled on the details and purpose of the study, and a written informed consent was taken. Non-consenting women were excluded from the study.

A total of 220 consecutive consenting women who met the inclusion criteria participated in the study. The data were obtained from participants with a pre-tested, semi-structured, interviewer-administered questionnaire. Information on sociodemographic characteristics, obstetric characteristics, knowledge of cervical cancer risk factors, and risk assessment was obtained. To assess the awareness of cervical cancer, participants were asked if they had ever heard about cervical cancer, its risk factors and screening modalities. Responses were recorded as either "Yes" or "No". Knowledge of risk factors was computed as a composite score based of correct responses to the risk factors. Each risk factor was scored 1 for a correct response and 0 for an incorrect response, yielding a cumulative score of 11. A score of 8 - 11 was categorised as good knowledge, 4 – 7 as fair knowledge, and 3 and below as poor knowledge. The risk-factor assessment for cervical cancer was done for each of the participants. These included age at coitarche, age at marriage, previous sexually transmitted infections, HIV infection status, partner with multiple sexual partners and number of sexual partners; and family history of cervical cancer.

The principles of ethics were upheld, and the collected data were kept confidential. The data was entered and analysed with IBM SPSS version 25. Descriptive and bivariate statistics were done. Data was presented in frequency distribution tables, charts, and cross-tabulations. The Chi-square test was used to assess factors associated with awareness of cervical cancer. Multivariate logistic regression was done to test for independent associations with the outcome variable. The level of significance was set at $p < 0.05$.

RESULTS

Table 1 shows the socio-demographic characteristics of patients. The mean age was 31.2 with a standard deviation of ±5.39 years. Most were professionals (40.9%), and 97.3% were married.

Table 1: Sociodemographic/Obstetric characteristics of the participants

Variables	**Frequency (%)**	**N=220**
Age group (years)		
≤ 25	30 (13.6)	
26 to 30	71 (32.3)	
31 to 35	75 (34.1)	
Above 35	44 (20.0)	
Occupation		
Professional	90 (40.9)	

Skilled	68 (30.9)
Unskilled	46 (20.9)
Unemployed	16 (7.3)
Level of education	
Primary	2 (0.9)
Secondary	29 (13.2)
Tertiary	189 (85.9)
Marital status	
Single	6 (2.7)
Married	214 (97.3)
Parity	
0	66 (30.0)
1-2	124 (56.3)
3-4	28 (12.7)
≥5	2 (0.9)

Forty-nine of 220 (22.3%) of patients had never heard of cervical cancer. Having multiple sexual partners was identified by most of the respondents as a risk factor for cervical cancer. (Table 2)

Table 2: Knowledge of risk factors for cervical cancer

Variables	Yes n (%)	No n (%)	Don't Know n (%)
Multiple sexual partners	116(52.7)	41(18.6)	63(28.6)
Male partner with multiple Sexual partners	123(55.9)	34(15.5)	63(28.6)
Early age of first sexual intercourse	61(27.7)	51(23.2)	108(49.1)
Early marriage/first pregnancy	51(23.2)	74(33.6)	95(43.2)
Low socioeconomic status	13(5.9)	145(65.9)	62(28.2)
Having many pregnancies	22(10.0)	95(43.2)	103(46.8)
Cigarette smoking	65(29.5)	49(22.3)	106(48.2)
Oral contraceptive use	66(30.0)	52(23.6)	102(46.4)
Human papillomavirus infection	67(30.5)	29(13.2)	124(56.4)
Caused by a sexually transmitted infection	107(48.6)	30(13.60	83(37.7)
HIV infection	53(24.1)	49(22.3)	118(53.6)

However, some women erroneously reported that cervical cancer is caused by vaginal washing or douching (25%), insertion of substances (19%), witchcraft (55.9%), spiritual attack (47%), irregular sexual intercourse (62.3%) and childbirth injury (20.9%). Of those who had knowledge of cervical cancer, 14.0% had good knowledge of the risk factors, 44.4% had fair knowledge, while 41.6% had poor knowledge. Most of the women (56.8%) attributed their knowledge to information from healthcare providers, and only 20% obtained it from mass media, including Radio and Television.

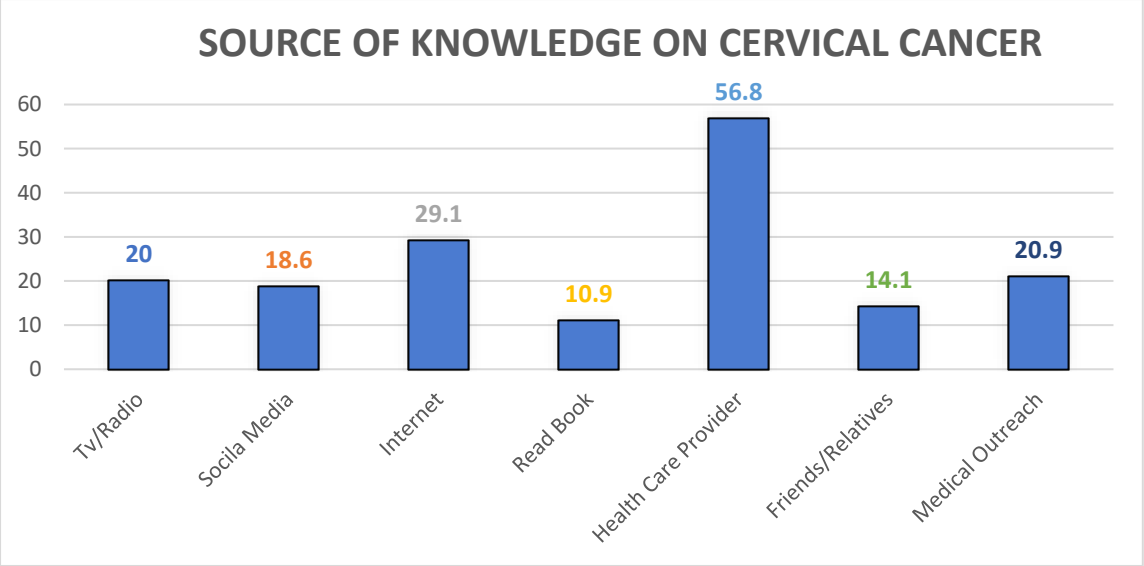

Fig. 1: Respondents' Sources of Knowledge

In Table 3; the assessment of common risk factors for cervical cancer is shown. Most common risk factors among the participants were multiple sexual partners (75.5%) and poor condom use (71.4%).

Table 3: Risk factor assessment for cervical cancer among the participants

Variables	**Frequency N=220 (%)**
Age at coitarche	
<20	26 (11.8)
20 to 25	130 (59.1)
>25	64 (29.1)
Age at marriage	
<20	2 (0.9)
20 to 25	78 (35.5)
>25	137 (62.3)
Not married	3 (1.4)
Use of condom during coitus	
Yes	63 (28.6)
No	157 (71.4)
Number of sexual partners	
1	54 (24.5)
≥2	166 (75.5)
Husband with > 1 sexual partner	
Yes	16 (7.3)
No	204 (92.7)
Previous STI*	
Yes	20 (9.1)
No	200 (90.9)
HIV status	
Negative	218 (99.1)
Don't know	2 (0.9)
Cigarette smoking	
Yes	4 (1.8)
No	216 (98.2)

***STI – Sexually transmitted infection**

Table 4 shows the bivariate analysis of the relationship between the sociodemographic variables and awareness of cervical cancer. Age, occupation, level of education and religion were important predictors of the level of awareness of cervical cancer. The multivariate logistic regression also showed that age and level of education were independently associated with the level of awareness of cervical cancer. (Table 5)

Table 4: Relationship between the sociodemographic variables and awareness of cervical cancer

Variables		Heard of Cervical Cancer		P value
		Yes (n)	No (n)	
Age	Mean ± SD	31.99 ± 5.16	28.31 ± 5.25	<0.0001
Occupational Class	Professional or Skilled	130	28	0.010
	Unskilled or Unemployed	41	21	
Ethnicity	Yoruba	146	39	0.329
	Others	25	10	
Level of Education	At least Secondary	6	25	< 0.000
	Tertiary	165	24	
Marital Status	Single	3	3	0.126*
	Married	168	46	
Religion	Islamic	44	22	0.010
	Christianity	127	27	

*Fisher's Exact test

Table 5: Multivariate Logistic regression of the relationship between the socio demographic variables and awareness of cervical cancer

Variables	Odd Ratio (95% CI)	P Value
Age	0.84 (0.77-0.92)	0.00
Occupation	0.88 (0.36-2.16)	0.78
Educational Level	33.39 (10.40-107.20)	0.00
Religion	1.40 (0.60-3.28)	0.44

DISCUSSION:

This study assessed the knowledge of risk factors for cervical cancer and the presence of cervical cancer risk factors among pregnant and postpartum women attending a maternal healthcare clinic. The main finding of this study was that over three-quarters of the participants were aware of cervical cancer; however, only about a tenth (14%) of the participants had good knowledge of the risk factors for cervical cancer. Having multiple sexual partners and poor condom use were the commonest risk factors for cervical cancer among the respondents.

The mean age of the study participants was 31.17 (±5.39) years, with over four-fifths (86.4%) of the participants being over 25 years. This is a relatively young cohort – reproductive age women, and is similar to those in studies carried out among pregnant women in Ibadan, Southwest and Owerri, South Eastern Nigeria, and Thailand.[23–25]

The majority (97.3%) of the participants were married and had formal education. These findings are consistent with several other studies done in Nigeria and Thailand[20],[21],[23],[24].

Married women are presumed to be sexually active and at risk of HPV infection and cervical cancer, as are single sexually active women. Over four-fifths (85.9%) of the participants had a tertiary education. The level of education is higher than the average among the Nigerian women population.[22] This may be due to the site of recruitment for the study, which is a relatively upscale teaching hospital attracting more women of a higher socioeconomic status. More than two-thirds of the respondents had at least one parous experience. A similar finding was reported in a study among pregnant women in Enugu and Lagos, Nigeria.[13,26] Multi-parity is associated with sexual exposure; hence, it increases the risk of cervical cancer in women.

Concerning the awareness of cervical cancer among the respondents, over three-quarters (77.7%) of the participants had heard about the disease. This is similar to the findings of other studies from Enugu and Owerri, Nigeria, which showed that 84% and 68.8% of pregnant women had heard about cervical cancer, respectively[20],[23]. This finding may be related to participants' levels of education, the increased frequency of public campaigns, and the level of awareness about cervical cancer. However, among those who have heard about cervical cancer, only a few (14%) had good knowledge of the risk factors, while more than half had poor to fair knowledge, respectively. A study done in Owerri, Nigeria, reported poor knowledge of cervical cancer risk factors among pregnant women[23]. Other studies conducted in Nigeria and Cameroon among women in the general population also demonstrated low levels of knowledge of cervical cancer risk factors[13],[25],[26]. Participants in this study were women in active reproductive years in whom proper awareness of cervical cancer and its preventive measures would help improve attitude, cervical screening practices, and reduce cervical cancer incidence and mortality. A higher level of education is associated with good knowledge of cervical cancer.[27]

In this study, about half of the respondents knew that multiple sexual partners and partner with multiple sexual partners were risk factors for cervical cancer; and almost a third knew that smoking and the use of oral contraceptives were cervical cancer risk factors. About a quarter knew that early coitarche (27.2%), HIV (24.1%), and early marriage/young age first pregnancy (23.2%) were risk factors for cervical cancer, while only a few were aware that multi-parity (10%) and low socioeconomic status (5.9%) were cervical cancer risk factors. These findings are in tandem with the report of a similar study done among pregnant women in Owerri, which showed that 14.7% and 28.6% were aware that smoking and early coitarche were cervical cancer risk factors. However, the proportion of respondents who considered HIV as a risk factor for cervical cancer was lower than the proportion reported by Dozie et al (44.6%) in Owerri, Nigeria.[23] The findings from this study were also similar to the findings of Okunowo et al in a study conducted in Lagos, Nigeria among pregnant and non-pregnant women which showed that almost two-third were aware of cervical cancer; multiple sexual partners (37.6%) and partners with multiple sexual partners (34.2%) were cervical cancer risk factors while about a tenth considered early first pregnancy (10.5%), multi-parity (9.3%) and use of oral contraceptive (11.7%) as risk factors for cervical cancer.[13] Less than a third of participants in this study were aware that HPV is a causative agent for cervical cancer. This is similar to findings from Owerri, Enugu, and Lagos, Nigeria, which showed that 19%, 8.1%, and 22.4%, respectively, were aware that HPV is a causative agent for cervical cancer.[13],[20],[23],[27] This is contrary to a study in Thailand, which demonstrated that almost three-quarters (74.2%) of the respondents were aware of HPV as the causative agent of cervical cancer. The difference could be attributed to public awareness programs, routine cervical screening in Thailand, rather than opportunistic screening, and the economic status of the countries. Thailand is an upper-middle-income country[31], while Nigeria is a lower-middle-income country.[32] The findings from this study and other Nigerian studies showed that more interventions need to be done through regular and well-coordinated efforts to raise awareness of cervical cancer risk factors, as the knowledge of the risk factors was low even among those who have heard about cervical cancer from mostly a healthcare provider/ medical outreach. This finding highlights either deficiencies

in the information provided or a lack of understanding on the part of the recipients. Some of these risk factors are modifiable; therefore, having knowledge of them would guide positive behavioural changes and good health-seeking behaviour.

The common sources of knowledge about cervical cancer were healthcare providers, the internet, social media, medical outreach, and television/radio. Less common sources were friends/relatives and books. This is in contrast to findings of Justin et al in Enugu among pregnant women, which showed that the most common sources of knowledge about cervical cancer were television and radio (42.4% and 41.2% respectively), and less common sources were healthcare providers (13.7%) and friends/relatives (2.9%).[26] This difference could be due to efforts by healthcare providers to increase awareness of cervical cancer, the level of education of the participants and possibly the study site/setting. Other studies among women of reproductive age in Oyo and Kwara State, Nigeria, revealed that the most common source of knowledge about cervical cancer is the media (62.5% and 49.8%, respectively)[33,34]. This difference could be due to the fact that these studies were carried out among women of reproductive age in the general population, compared to our study, which was conducted among pregnant and postpartum women who attended antenatal or postnatal clinics and would have had interactions with healthcare providers and routine health education during antenatal and postnatal care. Hence, every contact with the healthcare provider provides an opportunity to disseminate knowledge on cervical cancer and its risk factors.

In this study, about three-quarters of the participants have had multiple sexual partners. This is similar to findings of a study done in Kwara State, Nigeria, among women of reproductive age group, which reported that multiple sexual partners and early coitarche were the commonest risk factors[34]. The difference in the age of coitarche could be due to the educational level, as 85.9% of respondents in our study had a tertiary level of education, compared with 28.2% of the Kwara State study. The national demographic health survey revealed that among women aged 25-49, the median age of coitarche was highest among those with a tertiary level of education.[22]

The implication of this study is that the reproductive-age woman is sexually active and possibly parous, in addition to other factors that put these women at risk of cervical cancer. Many reproductive group women have risk factors for cervical cancer, but have poor knowledge of these risk factors. Knowledge of cervical cancer and a positive attitude towards prevention and its strategies can be enhanced in the short- and long-term. A previous study by Abdus-salam et al reported that with appropriate counselling and health education on cervical cancer prevention during antenatal care, women were willing to screen during postnatal clinic visits[35].

In addition, women may have heard about cervical cancer, but this information was not followed by correct knowledge. The healthcare providers and media have a major role to play in creating awareness and accurate information that will motivate uptake of cervical cancer prevention. Inadequate or incorrect knowledge is harmful to the populace, leading to misinformation and misconceptions.

Implication for Practice

It may be prudent to incorporate health education about common diseases, including cervical cancer, into routine ante- and post-natal clinic sessions as an important step in increasing awareness, improving health-seeking behaviours and reducing the incidence of cervical cancer. There is a need to develop innovative strategies to improve the awareness, knowledge, uptake and coverage of cervical cancer screening, especially in hard-to-reach communities. An example of such innovations is the introduction of mobile cancer screening trucks for health education and large-scale screening for HPV infection and cervical cancer. This is currently being implemented in some parts of South-western Nigeria.[36]

The limitation of this study is that it was conducted in a tertiary health facility, which may have led to a high level of awareness. A population-based study among pregnant and postpartum

women will give more information about the current state of awareness of cervical cancer and prevention in the community. Also, because this was a cross-sectional study, we could not infer that poor knowledge of cervical cancer risk factors translated into improved preventive measures.

Recommendations

We recommend that health care providers provide correct and up-to-date information regarding cervical cancer to the populace, especially at every contact with women of reproductive age, and to also ensure feedback to validate adequate understanding and clarity.

In conclusion, our study demonstrated the importance of formal education in raising awareness of cervical cancer. However, it also showed that without more focused and intense health education, this good awareness remains very superficial and is unlikely to lead to a better preventive lifestyle due to poor knowledge of risk factors.

Authorship Details:

R. A. Abdus-salam, R. O. Balogun, A. A. Abdus-salam - conceptualized the study;

R. A. Abdus-salam, R. O. Balogun, A. A. Abdus-salam - study design, data collection, analysis/interpretation; R. A. Abdus-salam, R. O. Balogun, A. A. Abdus-salam revised the final manuscript for intellectual content and all authors approved the final version for publication.

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