Awareness and Response to Yellow Fever Mass Media Campaigns Among Residents of Enugu and Delta States in Nigeria

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Abstract
Yellow fever is a high-impact, high-threat disease with a risk of international spread, representing a potential threat to global health security. The focus of this study was to assess the level of awareness of yellow fever mass media campaigns and the positive impacts on the health behaviour of the inhabitants of Enugu and Delta States in Nigeria. The study adopted an exploratory sequential mixed-method design, which involves qualitative and quantitative data. The population of this study was made up of residents of Delta and Enugu States in Nigeria. The sample size for the first phase of this study, which was the qualitative study (interview), was an interview of nine (9) people from the organisers of the yellow fever campaigns from health authorities, while the second phase, which was the quantitative study (survey), used a sample size of three hundred and eighty-four (384) respondents. The data generated were analysed using percentages (%) and frequency mean to answer the research questions, while the standard deviation was used to assess the precision or reliability of the survey results, which indicates that the sample data points are closer to the population mean, implying greater precision. The findings of the study indicate that a concern or interest in increasing public awareness about yellow fever aligns with efforts to educate people about the disease to prevent its spread and improve public health. The study concludes that a positive development in terms of public health suggests that efforts to combat the disease have been effective in the surveyed population. The study recommends that there is a need for advocacy, through the use of traditional rulers, church leaders, health workers, and so on, to educate the people on the programme using their local languages.

Keywords: Yellow fever, Mass media campaigns, Public Health, Awareness, Response

Introduction

Yellow fever is an acute viral haemorrhagic disease transmitted by Aedes Mosquito and has the potential to spread rapidly and cause serious public health impact. Yellow Fever is caused by Flavivirus. It causes symptoms within 3 to 6 days of infection. According to Odu (2020), the World Health Organisation (WHO) enumerates the symptoms associated with yellow fever as fever, headache, jaundice, muscle pain, nausea, vomiting, and exhaustion.

However, instances of this phenomenon have been documented in both Africa and America since the onset of the 20th century. Nevertheless, it is worth noting that the initial documented occurrence of the yellow fever outbreak in Nigeria took place specifically in Lagos in the year 1864. Subsequent occurrences of breakouts in Lagos took place in the years 1894, 1905, 1906, 1925, and 1926, as documented by Obi (2020). The subsequent outbreak occurred in Jos in 1969, resulting in the infection of more than 100,000 individuals. Subsequently, outbreaks were reported in 1987 and 1996, affecting over 120,000 individuals in several regions of the country, including Jos, Azare in Bauchi State, Ogoja in Cross River State, Oju in Benue State, and Ogbomosho in Oyo State (WHO, 2015). Following this period, there were infrequent occurrences

until September 2017, when a seven-year-old male child exhibited the characteristic manifestations of yellow fever in the Ifelodun Local Government Area (LGA) of Kwara State (Nwachukwu, et al., 2020).

On November 2nd, 2020, the Nigeria Centre for Disease Control (NCDC) notified the World Health Organisation (WHO) about a series of fatalities occurring in the Ute Okpu community, situated in the Ika North-East Local Government Area (LGA) of Delta State. According to the World Health Organisation (WHO, 2020), there were reported instances of the disease in four other districts within Ika North-East, namely Idumessah, OwaAlero, Owanta, and Umunede. Laboratory examinations were conducted at the mobile laboratory facility of Irrua Specialist Teaching Hospital (ISTH) in Delta State, whereby certain tests yielded positive results for Yellow Fever through the utilisation of polymerase chain reaction (PCR) technique.

According to the National Centre for Disease Control (NCDC, 2020), a report from the Rapid Response Team for Enugu State on November 4th, 2020, revealed the occurrence of 10 fatalities. The majority of the deceased were males between the ages of 4 and 65, and their primary occupation was identified as farming. However, a number of blood samples were gathered and subsequently dispatched to the National Reference Laboratory in Abuja for the purpose of conducting tests to detect the presence of viral hemorrhagic fevers. The findings obtained on November 10th, 2020, indicated the presence of six confirmed cases of yellow fever through polymerase chain reaction (PCR) testing in Enugu State.

The Nigerian government, in collaboration with the World Health Organisation (WHO) and Gavi, the Vaccine Alliance, has successfully initiated an expedited sequence of large-scale preventive vaccination campaigns to safeguard the Nigerian population against yellow fever. This initiative, known as the Eliminate Yellow Fever Epidemics (EYE) programme, has been implemented with the utmost safety measures (Henderson, 2020). According to Health news (2020), the agency has announced its intention to vaccinate a total of 95 million individuals as part of its yellow fever programme for the 2021–2022 year. This initiative is being implemented as a final effort to eradicate the epidemics associated with this disease. In order to align with the strategic plans of the Eliminate Yellow Fever Epidemics (EYE) partners, various initiatives have been implemented to raise awareness and educate the public about yellow fever transmission and prevention. These efforts involve a range of media platforms, including television campaigns, drama series, documentaries, programme highlights, radio jingles, YouTube videos, and other online sources. Additionally, among other forms, there are theatrical performances, posters, handbills, pamphlets, and music. Therefore, this study was carried out to assess thelevel of awareness of yellow fever mass media campaigns and the positive impacts on the health behavior of the inhabitants of Enugu and Delta States in Nigeria.

Yellow fever is a disease that is of public significance since its inception. It has constituted a stumbling block to development, hereby causing economic disaster. Yellow Fever remains a major public health issue in both Africa and South America. However, acceleration has been endorsed by the global strategy to Eliminate Yellow Fever Epidemics (EYE) by 2026 and Nigeria is a priority country in this regard.

In order to meet up with the Eliminate Yellow Fever Epidemics (EYE) partners' strategic plans, there have been many of yellow fever campaigns on: jingles on radio, documentaries, pamphlets, music, seminars, conferences, event launch, programme highlights, Television through drama series, YouTube and other internet sources, drama on radio, stage drama, posters, handbills, symposium and lectures and so on, organized from time to time mostly by governmental and non-governmental organizations for the purposes of creation of awareness and educating the general public about how yellow fever is transmitted and how to avoid contracting the yellow fever disease. The target of these prevention promotions is finding an acceptable and entertaining means of reaching more people and encouraging them to help Eliminate Yellow Fever Epidemics (EYE).

However, records are not available on how much of the knowledge acquired is practiced in the Eliminate Yellow Fever Epidemics (EYE), project in Nigeria. This has remained a concern,

and this study was aimed at assessing the level of awareness of yellow fever mass media campaigns and the positive impacts on the health behaviour of the residents of Enugu and Delta States in Nigeria, specifically, the study sought to: Identified the available mass media campaigns, ascertained the level of awareness and outlined the positive impacts of yellow fever mass media campaigns on the health behaviour of the inhabitants of Enugu and Delta States in Nigeria.

Research Questions

1. What are the strategic mass media campaigns of yellow fever disease created in Enugu and Delta States in Nigeria?
2. Has the media campaign created all the necessary awareness on yellow fever disease in Enugu and Delta States in Nigeria?
3. Has the awareness made any positive impact on the health behavior of the inhabitants of Enugu and Delta States in Nigeria?

Literature Review

Barnett (2007) found out that yellow fever continues to occur in regions of Africa and South America, and this calls for judicious use of yellow fever vaccine. Adogo and Ogoh (2020), on their study reveal ongoing transmission of yellow fever in Nigeria. Therefore, the eradication of yellow fever in Nigeria necessitates the adoption of a comprehensive strategy that includes key stakeholders and the entire population. In a study conducted by Lindsey et al. (2022), it was determined that the most effective approach for achieving sustained high vaccination coverage is to integrate Yellow Fever vaccination into routine immunisation (RI) programmes and perform supplemental immunisation activities, such as catch-up campaigns targeting older populations. Findings from studies carried out by Amponsa-Achiano, Frimpong, Barradas, Bandoh, & Kenu, (2022) found historical approaches, such as using mass media, celebrity ambassadors, and communication centers to promote vaccine uptake and address hesitancy, were used foryellow fever vaccine deployment.

Amponsa-Achiano et al. (2022) also found that working together with the Ghana FDA early on is important to make it easier to evaluate and approve vaccinations before they are given, as seen in the polio and yellow fever campaigns. Adu-Fokuo, Cheng, Yin, and Giwa (2023) came to the conclusion that the benefits of receiving the yellow fever vaccination outweigh any potential risks related to adverse events or mortality.

Consequentially, Nwachukwu et al. (2020) made it apparent that risk communication and social mobilisation encompassed various strategies such as advocating for important stakeholders, engaging with the community, monitoring media outlets, conducting phone-in programmes on radio and television, disseminating information education and communication (IEC) materials, and delivering targeted messages to specific audiences. The research conducted by Nwachukwu et al. (2022) demonstrated the significance of employing case-based surveillance as a crucial approach in the management and prevention of yellow fever. Furthermore, it is worth noting that this approach aids in the identification of regions with a high risk of disease transmission, thereby facilitating targeted preventive mass vaccination initiatives. Additionally, it enables the timely detection of outbreaks, necessitating emergency vaccination responses as mandated by the International Health Regulations (IHR). It is crucial to emphasise that any such outbreaks must be quickly notified to the World Health Organisation (WHO) within a 24-hour. Study carried out by Jean et al (2021), illustrates that the self-controlled case series (SCCS) method can be advantageously applied at the population level in order to evaluate a public health intervention. According to the findings of Inusah, Gbeti, Dzomeku, Head, & Shamsu-Deen, (2023), there is room for improvement in Ghanaian strategies for yellow fever control. The study suggests that enhancing awareness can be achieved through the implementation of locally customised education and health promotion activities. According to a study conducted by Ejikeme et al. (2022), in order to ensure the success of the research, it is imperative to engage in advocacy with important stakeholders, actively involve the community, utilise radio and

television phone-in programmes, deliver targeted messages to specific audiences, and visit administrators of secondary and tertiary healthcare facilities. Additionally, it is crucial to provide training to healthcare workers on theepidemiology, reporting, and management of yellow fever. Another study conducted by Kalra and Ratti (2022) suggests that changes in behaviour because of these programmes result in the establishment of a separate class dubbed the conscious class. This course not only endeavours to safeguard individuals from mosquito-borne infections but also aims to mitigate the mosquito population. Okeh, Wogu, and Nwokedi (2022) conducted a study that explored the significance of mass media and interpersonal communications as mediating routes for disseminating information and promoting public awareness in mass media campaigns.

Another study conducted by Kalra and Ratti (2022) suggests that changes in behaviour because of these programmes result in the establishment of a separate class dubbed the conscious class. This course not only endeavours to safeguard individuals from mosquito-borne infections but also aims to mitigate the mosquito population. Okeh, Wogu, and Nwokedi (2022) conducted a study that explored the significance of mass media and interpersonal communications as mediating routes for disseminating information and promoting public awareness in mass media campaigns. Thus, in Nigeria public health communications usually incorporates the use of media campaigns against health issues like yellow fever, polio, malaria, measles, HIV/AIDS, cholera, tuberculosis, leprosy, among others. Mass media appears to always be at the centre. Izogo and Chukwuemeka's (2013) study showed how broadcast media, specifically radio and television, have the potential to effectively disseminate knowledge and information about HIV/AIDS. However, the authors acknowledged the presence of additional factors, such as household and social influences, that may also contribute to the observed effects. This study provides confirmation that mass media is being employed in Nigeria as a means to influence individuals' behaviour and lifestyle in relation to health matters.

Theoretical Framework

This study adopted I-Change Model or the Integrated Model**.** The I-Change model or the Integrated model is for explaining health behaviour (De Vries, 2017). The model under consideration is a synthesis of various theoretical frameworks, namely De Vries & Mudde's Attitude-Social-Influence-Self-Efficacy model, Ajzen's theory of planned behaviour, Bandura's social cognitive theory, Prochaska's trans-theoretical model, the health belief model, and goal-setting theories. The I-change model posits that the process of behavioural change can be delineated into a minimum of three distinct phases. The three key processes involved in behavioural change are awareness, motivation, and action. According to De Vries (2017), specific determinants are more pertinent for each phase.

The development of awareness regarding a specific issue in an individual is contingent upon the acquisition of precise information and the perception of risks associated with one's own activity. Additionally, an individual's awareness of a particular health behaviour can be stimulated by their own introspection and evaluation of their actions (Fishbein & Ajzen, 1975, as cited in Jones et al., 2015).

The key to changing an audience's total behaviour lies in choosing to change what he or she believes in. In Nigeria, for instance, some believe that yellow fever is diabolic, while others believed that children suffering from yellow fever are possessed by evil spirit, and if eventually, the child dies, they will assume that the child is "ogbanje", that is, marine spirit. The Yellow fever awareness campaigns have made people to be aware of the killer disease called yellow fever, its actual causes which are Aedesaegypti mosquito, its effects, cure and how to prevent it.

The motivation to modify a behaviour is considered to be contingent upon an individual's attitude, social impact beliefs (including norms, behaviour, and support from others), and self-efficacy expectations (the perceived capability to engage in a specific health behaviour) (Fishbein & Ajzen, 1975, as cited in Jones et al., 2015). The I-Change model posits that motivation processes are influenced by a range of predisposition factors, including behavioural factors (such

as lifestyle choices), psychological factors (such as personality traits), biological factors (such as gender and genetic predisposition), social and cultural factors (such as beliefs and attitudes towards mosquito and yellow fever disease), and information factors (such as the quantity of messages received through yellow fever awareness campaigns and the channels and sources utilised). Actually, the yellow fever awareness campaigns have changed some behaviour of human beings towards yellow fever disease.

The subject of action will be discussed in this academic text. The correlation between intentions and behaviour is not always definitive. In addition to positive intention, several factors play a role in choosing action, including self-efficacy, action planning, and goal setting. In the context of action planning, there exists a distinction between three types: preparation planning, initiation planning, and coping or maintenance planning. Furthermore, it is imperative to acquire the necessary abilities for engaging in novel health behaviours (Fishbein & Ajzen, 1975, as cited in Jones et al., 2015). The yellow fever awareness campaigns aim to cultivate the essential skills within the audience to adopt new behaviours, namely by persuading individuals to undertake preventive measures that reduce the risk of yellow fever transmission. These measures primarily involve avoiding contact with the Aedes aegypti mosquito and maintaining clean living surroundings. Additionally, it persuades individuals to undergo yellow fever vaccination, engage in indoor residual spraying (IRS), and maintain cleanliness in their surroundings.

Therefore, the yellow fever awareness campaigns focus on the need for individuals, families and communities to take yellow fever inoculation jabs, embark on indoor residual spraying and environment cleaning in order to avoid, cure and prevent yellow fever. It has gone a long way in convincing the audience to change from their previous belief of yellow fever disease, its prevention and cure.

Methodology

For easy gathering of information, Exploratory Mixed Method Design was used. According to Creswell (2018), an exploratory sequential mixed method is a design in which the researcher first begins by exploring with qualitative data and analysis and then uses the findings in a second quantitative phase. This study focused on Assessing the awareness of yellow fever mass media campaigns among the inhabitants of Enugu and Delta States in Nigeria. The population of this study was residents of Delta and Enugu States in Nigeria. The reason for the selection is because according to (WHO, 2020), yellow fever disease occurred only in Delta and Enugu State in the year 2020. The population projection of Delta State in 2022 is 5,636,100 while the population projection of Enugu State in 2022 is 4,690,100(citypopulation, 2022), given a total population of 10,326,200 respondents. The first phase of this study, which was the qualitative study (interview), is an interview of nine (9) people from the organizers of the yellow fever campaigns; WHO, NCDC and Federal Ministry of Health. The interview was used to generate data on media coverage of the yellow fever campaigns in Enugu and Delta States in Nigeria, given, the fifteen (15) campaigns available or at reach during the period of this research.

The second phase, which was the quantitative study (survey), used a sample size of Three hundred and eighty-four (384) respondents. The sample was determined using Krejcie& Morgan sampling method. Krejcie& Morgan (1970, in Kenpro, 2012) provides a stratified formula for determining sample size. This sample size was a fair representation of the entire population of Delta and Enugu States in Nigeria. The study adopted multi-stage sampling technique. From Enugu and Delta States in Nigeria, the researcher also obtained a list of all the local government areas based on the records of City population (2022). The study adopted both purposively and quota sampling to select Local government Area that were affected during the outbreak in 2020. One local government area each was purposively selected from each of the two states. Ika North-East Local Government Area was purposively selected from Delta State viz: Ute Okpu, Idumessah, OwaAlero, Owanta, while Igbo-Eze North Local Government Umunede; and Ette, Umuopu, Isiugwu, Aji, Okpo, and Igogoro communities in Igbo-Eze North Local Government Area (LGA) of Enugu State were purposively selected, making a total of twelve communities. The

reason for the selection is because the 2020 yellow fever disease occurred only in the two Local Governments that is one local government from each of the two states affected, as recorded by (NCDC, 2020).

However, quota sampling was adopted to select thirty-five (35) respondents from each of the selected communities, except Igogoro, which had thirty-four (34) respondents. This is because Igogoro has the smallest size among all the selected communities.

The data that was gathered were analysed both in qualitative and quantitative forms. The data were presented, analyzed, and discussed in relation to their alignment with the research objectives posited in the study. Out of the total of three hundred and eighty-four (384) copies of the questionnaire administered, three hundred and forty-six (346), 90% copies were correctly completed and returned, while thirty-eight (38), 10% were not returned. Therefore, the research observed a return rate of 90%, that is 346 copies of the questionnaire.

Results

Presentation of Quanlitative Findings

Research Question One: What are the strategic mass media campaigns of yellow fever disease createdin Enugu and Delta States in Nigeria?

A total of fifteen (15) campaigns were available/at reach at the time of this study.The strategic mass media campaigns created and used in Enugu and Delta states included awareness creation programs, disease prevention programs, disease management programs, disease situation report program, disease incidence programs, vaccination awareness programs, and self-protection measures.

Using accessible media outlets and other approaches, the media campaigns covered issues on what people needed to know about yellow fever; the causative agent; the disease carrier or vector; the signs and symptoms; efforts to tackle the disease; efforts to reduce the spread; actions to be taken by members of the communities; places to go for vaccination; vaccine cost, safety and efficacy; treatment options; progress made concerning the eradication of the disease; way forward for complete eradication; avoiding fake and illegal vaccines.

Presentation of Quantitative Findings

Research Question Two: Has the mass media campaign created all the necessary awareness on yellow fever disease in Enugu and Delta States in Nigeria?

Table 1: Frequency, Percentage, Mean and Standard Deviation of respondents' awareness level to yellow fever mass media campaigns

S/N	Statements	Strongly Agree n(%)	Agree n(%)	Disagree n(%)	Strongly Disagree n(%)	Mean	SD	Remark
1	There are Yellow Fever vaccination campaigns on radio and television	99(28.6)	117(33.8)	72(20.38)	58(16.8)	2.74	1.05	Agree
2	I listen to radio jingles on yellow fever	101(31.5)	201(55.8)	16(4.6%)	28(8.1)	3.11	0.82	Agree
3	I watch yellow fever preventive messages on television	16(4.6)	28(8.1)	201(58.1)	101(29.2)	1.88	0.74	Disagree
4	I see yellow fever preventive messages on billboard and handbills	72(20.8)	99(28.6)	100(28.9)	75(21.7)	2.49	1.05	Disagree
5	I read yellow fever preventive messages on newspaper	72(20.8)	99(28.6)	100(28.9)	75(21.7)	2.49	1.05	Disagree

6	I am aware that all children older than 9 months and adults will be vaccinated, except pregnant women.	97(28.0)	119(34.4)	70(20.2)	60(17.3)	2.73	1.05	Agree
7	I have been vaccinated at the nearest health center or vaccination post through the information I got from mass media on yellow fever.	96(27.7)	120(34.7)	68(19.7)	62(17.9)	2.72	1.06	Agree
8	I received my yellow card after vaccination post through the information I got from mass media on yellow fever.	97(28.0)	75(21.7)	98(28.3)	76(22.0)	2.56	1.12	Agree
9	I am aware that yellow card is effective for 10 years	97(28.0)	75(21.7)	98(28.3)	76(22.0)	2.56	1.12	Agree
10	I have been paying attention to mass media messages on yellow fever	101(29.2)	201(58.1)	16(4.6)	28(8.1)	3.08	0.81	Agree
11	I have received information about yellow fever on some of the following; Radio, Television, Newspaper, Posters, banners, handbills, Town criers, Churches/mosques, Neighbour, Social mobilizers, SMS, and Others	199(57.5)	103(29.8)	20(5.8)	24(6.9)	3.38	0.88	Agree
12	Effective communication through the radio and television has given us a clear understanding regarding the yellow fever and the public health response	99(28.6)	117(33.8)	72(20.8)	58(16.8)	2.74	1.05	Agree
13	I am now aware that there is ongoing plan to eradicate yellow fever in Nigeria by the year 2026	16(4.6)	28(8.1)	201(58.1)	101(29.2)	1.88	0.74	Disagree
14	My family members have been vaccinated against yellow fever	201(58.1)	101(29.2)	18(5.2)	26(7.5)	3.38	0.89	Agree
15	I will vaccinate my family against yellow fever	201(58.1)	101(29.2)	18(5.2)	26(7.5)	3.38	0.89	Agree
16	We learn about the importance of yellow fever vaccination on radio and television	99(28.6)	117(33.8)	72(20.8)	58(16.6)	2.74	1.05	Agree
	Grand Mean and Standard Deviation					2.74	0.90	Agree

Key: n= frequency, % = percentage, SD= Standard Deviation

From the table above, 216 (62.4%) respondents strongly agreed or agreed there are Yellow Fever vaccination campaigns on radio and television (M =2.74, SD = 1.05). 302 (87.3%) respondents strongly agreed or agreed they listen to radio jingles on yellow fever (M =3.11, SD = 0.82). 302 (87.3%) respondents strongly disagreed or disagreed they watch yellow fever preventive messages on television (M =1.88, SD = 0.74). 175 (50.6%) respondents strongly disagreed or disagreed they see yellow fever preventive messages on billboard and handbills (M =2.49, SD = 1.10). 175 (50.6%) respondents strongly disagreed or disagreed they see yellow fever preventive messages on billboard and handbills (M =2.49, SD = 1.10).

Similarly, 175 (50.6%) respondents strongly disagreed or disagreed they read yellow fever preventive messages on newspaper (M =2.49, SD = 1.10).216 (62.4%) respondents strongly agreed or agreed they are aware that all children older than 9 months and adults will be vaccinated, except pregnant women (M =2.73, SD = 1.05). 216 (62.4%) respondents strongly agreed or agreed they have been vaccinated at the nearest health center or vaccination post through the information they got from mass media on yellow fever. (M =2.72, SD = 1.06). 172 (49.7%) respondents strongly agreed or agreed they received yellow card after vaccination post through the information they got from mass media on yellow fever (M =2.56, SD = 1.12).172 (49.7%) respondents strongly agreed or agreed they are aware that yellow card is effective for 10 years (M =2.56, SD = 1.12). 302(87.3%) respondents strongly agreed or agreed they have been paying attention to mass media messages on yellow fever (M =3.08, SD = 0.81).

Furthermore, 302(87.3%) respondents strongly agreed or agreed they have received information about yellow fever on some of the following; Radio, Television, Newspaper, Posters, banners, handbills, Town criers, Churches/mosques, Neighbour, Social mobilizers, SMS, and Others (M =3.38, SD = 0.88). 216(62.4%) respondents strongly agreed or agreed effective communication through the radio and television has given us a clear understanding regarding the yellow fever and the public health response s(M =2.74, SD = 1.05). 302 (87.3%) respondents strongly disagreed or disagreed they are now aware that there is ongoing plan to eradicate yellow fever in Nigeria by the year 2026(M =1.88, SD = 0.74). 302 (87.3%) respondents strongly agreed or agreed their family members have been vaccinated against yellow fever (M =3.38, SD = 0.89). Similarly, 302 (87.3%) respondents strongly agreed or agreed they will vaccinate my family against yellow fever (M =3.38, SD = 0.89). 216 (62.4%) respondents strongly agreed or agreed they learn about the importance of yellow fever vaccination on radio and television (M =2.74, SD = 1.05).

The grand mean of 2.74 established the fact that the respondents generally agreed to all the item statements on level of audience awareness to yellow fever mass media campaigns in Enugu and Delta States in Nigeria.

Research Question Three: Has the awareness made any positive impact on the health behavior of the inhabitants of Enugu and Delta States in Nigeria?

Table 2: Frequency, Percentage, Mean and Standard Deviation of Positive impact of the awareness campaigns on the environmental health behavior of the inhabitants of Enugu and Delta States in Nigeria

S/N	Statements	Strongly Agree n(%)	Agree n(%)	Disagree n(%)	Strongly Disagree n(%)	Mean	SD	Remark
1	Household members can now describe signs and symptoms fever can be obtained	97(28.0)	119(34.4)	68(19.7)	62(17.9)	2.73	1.06	Agree
2	Household members are now aware that some symptoms of yellow fever are fever, headache, jaundice, muscle pain, nausea, vomiting and fatigue	115(33.2)	101(29.2)	70(20.2)	60(17.3)	2.78	1.09	Agree
3	Household members can now state correctly the role Aedes and Haemogogus mosquitoes play in the transmission of yellow fever, describe the dangers that yellow fever disease poses to them and therefore try to avoid contact with them	105(30.3)	111(32.1)	68(19.7)	62(17.9)	2.75	1.08	Agree
4	I have taken the yellow fever vaccine	201(58.1)	99(28.6)	26(7.5)	20(5.8)	3.39	0.86	Agree
5	Household members can now identify bleeding from the nose, gums or skin or gastrointestinal tract as also symptoms of yellow fever	110(31.8)	106(30.6)	65(18.8)	65(18.8)	2.75	1.10	Agree
6	Household members are now aware that contacts with the aedes or haemogogus specie of mosquitoes, causes symptoms within 3 to 6 days of infection	107(30.9)	109(31.5)	60(17.3)	70(20.2)	2.73	1.11	Agree
7	Household members are now aware that yellow fever can cause a mild febrile illness in some individuals to a more toxic illness that can, unfortunately, lead to death in others	106(30.6)	110(31.8)	51(14.7)	79(22.8)	2.70	1.13	Agree
8	I am aware that yellow fever can affect many organs, damage blood vessels, and degrade the body's ability to regulate	103(29.8)	113(32.7)	50(14.5)	80(23.1)	2.69	1.13	Agree

	itself							
9	Household members are now aware of the benefits of Indoor Residual Spraying (IRS) and they also understand the procedures involved in the exercise and we partake in this exercise	101(29.2)	115(33.2)	62(17.9)	68(19.7)	2.72	1.09	Disagree
10	Household members are now knowledgeable on the safety of insecticides when used appropriately	100(28.9)	116(33.5)	60(17.3)	70(20.2)	2.71	1.09	Agree
11	Family members can now recognize and describe the symptoms of yellow fever and state the need to seek treatment within 24 hours and also have access to appropriate and affordable treatment for yellow fever within their communities	200(57.8)	100(28.9)	24(6.9)	22(6.4)	3.38	0.87	Agree
	Grand Mean and Standard Deviation					2.85	1.03	Agree

Key: n= frequency, % = percentage, SD= Standard Deviation

From the table above, 216 (62.4%) respondents strongly agreed or agreed that household members can now describe signs and symptoms that should prompt them to seek treatment for yellow fever, mention where correct diagnosis and safe medicines for treating yellow fever can be obtained (M =2.73, SD = 1.06).

Also, 216 (62.4%) respondents strongly agreed or agreed that household members are now aware that some symptoms of yellow fever are fever, headache, jaundice, muscle pain, nausea, vomiting and fatigue (M =2.78, SD = 1.09). Similarly, Also, 216 (62.4%) respondents strongly agreed or agreed that household members can now state correctly the role Aedes and Haemogogus mosquitoes play a role in the transmission of yellow fever; describe the dangers that yellow fever disease poses to them, and therefore try to avoid contact with them (M =2.75, SD = 1.08). 300 (87.7%) respondents strongly agreed or agreed that they have taken the yellow fever vaccine (M =3.39, SD = 0.86). 216 (62.4%) respondents strongly agreed or agreed that household members can now identify bleeding from the nose, gums, skin, or gastrointestinal tract as also symptoms of yellow fever (M =2.75, SD = 1.10). 216 (62.4%) respondents strongly agreed or agreed that household members can now be aware that contacts with the Aedes or Haemogogus species of mosquitoes cause symptoms within 3 to 6 days of infection (M =2.73, SD = 1.11). 216 (62.4%) respondents strongly agreed or agreed that household members are now aware that yellow fever can cause a mild febrile illness in some individuals to a more toxic illness that can, unfortunately, lead to death in others (M =2.70, SD = 1.13).

In addition, 216 (62.4%) respondents strongly agreed or agreed that they are aware that yellow fever can affect many organs, damage blood vessels, and degrade the body's ability to regulate itself (M =2.69, SD = 1.13). 216 (62.4%) respondents strongly agreed or agreed that they are aware that yellow fever can affect many organs, damage blood vessels, and degrade the body's ability to regulate itself (M =2.69, SD = 1.13). 216 (62.4%) respondents strongly agreed or agreed that household members are now aware of the benefits of indoor residual spraying (IRS), and they also understand the procedures involved in the exercise, and we partake in this exercise (M =2.72, SD = 1.09). 216 (62.4%) respondents strongly agreed or agreed that household members are now knowledgeable on the safety of insecticides when used appropriately (M =2.71, SD = 1.09). Lastly,

300 (86.7%) respondents strongly agreed or agreed that family members can now recognize and describe the symptoms of yellow fever and state the need to seek treatment within 24 hours and have access to appropriate and affordable treatment for yellow fever within their communities (M =3.38, SD = 0.87).

The grand mean of 2.85 established the fact that the respondents generally agreed to all the item statements on the positive impact of the awareness campaigns on the environmental health behaviour of the inhabitants of Enugu and Delta States in Nigeria.

Discussion of findings

What are the strategic mass media campaigns of yellow fever disease created in Enugu and Delta States in Nigeria?

Interviews generated under this research question aimed at understanding the strategic yellow fever mass media campaign that created awareness-creation programmes, disease prevention, disease management, and disease situation report programmes among others. Responses generated from nine respondents focused on issues such as what people needed to know about yellow fever, the causative agent, the disease carrier or vector, the signs and symptoms, and efforts to tackle the disease, among others. This indicates that a concern or interest in increasing public awareness about yellow fever aligns with efforts to educate people about the disease to prevent its spread and improve public health. The present study aligns with the conclusions drawn by Inusah et al. (2023), which indicate that there is room for enhancement in Ghanaian strategies for yellow fever management. Specifically, the authors suggest implementing locally customised educational initiatives and health promotion programmes as means to enhance public awareness. The study also corroborates Kalra and Ratti's (2022) finding that media programmes create awareness by implementing personal protection and controlling vector pulations. The remark implies that the respondents were actively involved in deliberating about several facets of yellow fever, primarily emphasizing the exchange of significant knowledge pertaining to the disease, its aetiology, modes of transmission, symptoms, and initiatives undertaken to mitigate its impact. The provided information possesses potential value in terms of comprehending the extent of awareness and knowledge among the populace concerning yellow fever.

Has the mass media campaign created all the necessary awareness on yellow fever disease in Enugu and Delta States in Nigeria?

The quantitative analysis shown in the tables and frequencies on Table 1 provides an answer to research question two. With a grand mean of 2.74, the study found that the respondents generally agreed with all the item statements regarding the audience's level of knowledge of yellow fever mass media campaigns in Enugu and Delta States in Nigeria. The major finding under this research question is that the majority of the respondents sampled have received information about yellow fever on some of the following: radio, television, newspapers, posters, banners, handbills, town criers, churches and mosques, neighbours, social mobilizers, SMS, and have also been vaccinated against yellow fever and will vaccinate my family against yellow fever. The strategic utilization of mass media in public health initiatives has proven to be of significant importance. However, its effectiveness in inducing behavioural change has been limited due to the influence of the socio-cultural context within which it functions. This study aligns with the study conducted by Izogo and Chukwuemeka (2013). The findings of their study indicated that broadcast media platforms, specifically radio and television, exerted a favourable influence on enhancing awareness and disseminating information about HIV/AIDS. However, the authors acknowledged the potential role of additional factors, such as familial and peer influences, in shaping individuals' knowledge and attitudes towards HIV/AIDS. This study provides empirical evidence supporting the utilization of mass media in Nigeria to influence individuals' behaviour and lifestyle pertaining to health-related matters. The study coincides with the findings of Ejikeme et al. (2022), who

emphasized the importance of conducting advocacy with key stakeholders, engaging the community, utilizing radio and television phone-in programmes, and delivering focused messages to the intended audience to achieve successful outcomes.

Has the awareness made any positive impact on the health behavior of the inhabitants of Enugu and Delta States in Nigeria?

The study also showed a grand mean of 2.85, which established the fact that the respondents generally agreed to all the item statements on the positive influence of the awareness campaigns on the environmental health behaviour of the inhabitants of Enugu and Delta States in Nigeria. The major finding under this research question is that the majority of the respondents sampled have taken the yellow fever vaccine, and family members can now recognize and describe the symptoms of yellow fever and state the need to seek treatment within 24 hours. The respondents also have access to appropriate and affordable treatment for yellow fever within their communities. This implies that there has been progress in both vaccination coverage and public awareness regarding yellow fever. There is also a positive development in terms of public health, which suggests that efforts to combat the disease have been effective in the surveyed population. The study, in tandem with the findings of Kalra and Ratti (2022), found that there is an assumption that media programme play a role in raising knowledge about personal protection and controlling the population of vectors. The implementation of these programme leads to a transformation in behaviour, resulting in the emergence of a distinct social group referred to as the aware class. This is consistent with Adu-Fokuo, Cheng, Yin, and Giwa (2023), who found that the benefits of the vaccination outweigh the risk of adverse events or fatalities. The adverse events that follow yellow fever immunization are not strong and suggest that most of the respondents do not have serious repercussions after the vaccination. In accordance with the findings of Inusah, Gbeti, Dzomeku, Head, & Shamsu-Deen, (2023), it is suggested that there is room for enhancement in Ghanaian strategies for yellow fever control. This may involve the implementation of region-specific educational initiatives and health promotion campaigns aimed at enhancing public awareness.

Conclusion

On the basis of the analysis of data and discussion of findings provided above, the study concludes that a concern or interest in increasing public awareness about yellow fever aligns with efforts to educate people about the disease to prevent its spread and improve public health. And also that knowledgeable and experienced health professionals are needed to share correct and factual information concerning the disease outbreak and measures to be taken for its prevention, treatment, and management to avoid misinformation and wrong practices. Strategically, platforms such as popular television and radio stations, billboards, and fliers would increase outreach among the target audience. The strategic utilization of mass media in public health initiatives has proven to be of significant importance. However, its effectiveness in inducing behavioural change has been limited due to the influence of the socio-cultural context within which it functions.

It implies that there has been progress in both vaccination coverage and public awareness regarding yellow fever. There is also a positive development in terms of public health, which suggests that efforts to combat the disease have been effective in the surveyed population.

It is on the basis of the above that the following recommendations are made.

Recommendations

This research recommends the following:

1. The media, public, health workers, and relevant authorities should be educated about yellow fever, the mode of transmission, prevention, treatment, and control measures, with emphasis on the availability of a safe and effective vaccine.

2. There is need to strengthen Information, Education and Communication activities at community level to guide the smooth implementation of yellow fever control and prevention activities by health providers.
3. There is also a need for advocacy, through the use of traditional rulers, church leaders, health workers, and so on, to educate the people on the programme using their local languages.
4. There is a need to spread the yellow fever prevention messages in partnership with associations, NGOs, and other community-based organizations, community workers, and religious leaders.
5. Yellow fever campaigns should be advertised in public places using town criers and megaphones.

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