

Influence of Radio Music Broadcasting On COVID-19 Vaccine Acceptance among Women in Rural Communities of Delta State, Nigeria

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Abstract

Music broadcasting is an essential feature of radio communication, and musical lyrics constitute an essential component of public health-related media campaigns. This study explores the influence of radio music broadcasting on the perception, attitudes and behaviour of women towards COVID-19 vaccine acceptance in twelve rural communities of Delta State, Nigeria. Anchored on the Theory of Reasoned Action/Behaviour, the study utilises the survey research design to critically analyse responses obtained from 400 respondents drawn through multistage sampling. Findings showed that radio is a major source of information on COVID-19 vaccines among the respondents, and radio music broadcasting has a significant positive influence on the respondents' perception, attitude and behaviour towards COVID-19 vaccine acceptance and willingness to be vaccinated. Specifically, the findings suggest that increased exposure to radio music broadcasting on COVID-19 vaccine tends to enhance the respondents' overall acceptance of the vaccine as well as their willingness to get vaccinated. The study recommends the need for improved access to radio music broadcasting programmes in rural communities and the development of more suitable programming contents to promote the acceptance of recommended public health behaviours among rural dwellers.

Keywords: music broadcasting, radio communication, public health, COVID-19 vaccine, rural communities

1. Introduction

It is unarguable that the coronavirus pandemic, which is a Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), left an indelible mark on the world, prompting holistic changes across various spheres of society (Henderson, 2020). As of October 22, 2023, the global tally of COVID-19 cases had exceeded 700 million, with over 46 million active cases (World-Health-Organization, 2020). In retrospect, this unprecedented crisis resulted in the suspension of major social gatherings and disrupted daily lives worldwide, causing profound consequences for social, religious, economic, political, and medical domains, especially in the early months of the pandemic (Elgendy, Elmawla, Abdel, Elgendy & Abdelrahim, 2021).

Nigeria, like the rest of the world, was not immune to the far-reaching effects of the pandemic, having recorded its first case in March 2020 and numerous others in the months that followed (Elgendy et al., 2021). In response to this global crisis, scientists embarked on an urgent mission to develop vaccines against COVID-19, but despite their achievements, vaccine hesitancy emerged as a formidable barrier to widespread vaccination and development of herd immunity (Khan, Mallhi & Alotaibi, 2020).

Consequently, stakeholders have expressed concerns that vaccine hesitancy, driven by factors such as the lack of experimental trials, concerns about vaccine side effects, and the proliferation of vaccine-related misinformation, poses a serious threat to the success of COVID-19 vaccination campaigns worldwide (Khan et al., 2020). With the continuous spread of the virus and its social and economic costs, vaccination has become widely adopted as the best strategy for preventing the pandemic (Shih, Wu, Tu, Chi, 2020). This realisation is strongly rooted in the fact that vaccination had previously played a pivotal role in controlling infectious diseases, such as yellow fever, polio, cerebrospinal meningitis, cholera and tuberculosis, among others (Chukwuocha, Okorie, Iwuoha, Ibe, Dozie, 2018). Yet, the development of the

COVID-19 vaccine has been met with a mixed reception, with a substantial number of people around the world expressing hesitancy to vaccination (Piltch-Loeb & DiClemente, 2020).

In Nigeria, vaccine hesitancy is exacerbated by limited public knowledge about the vaccine, poor adherence to hygiene practices, and the spread of misinformation and fake news on social media platforms regarding the vaccine's side effects (Okafor, 2021). This information gap is particularly pronounced in rural communities, where access to media messages about COVID-19 vaccine safety is limited (Chukwuocha et al., 2018).

Generally, the mass media have emerged as powerful tools for delivering vaccine-related information, correcting misconceptions, and influencing public attitudes (Casciotti, Smith, Tsui, 2014). Media platforms, such as radio, play crucial roles in disseminating vaccine information and influencing public perceptions towards serious infectious diseases like COVID-19 (Clarke, 2011). Radio music broadcasting is a prominent and influential medium that reaches diverse audiences worldwide. While it serves as a source of entertainment and cultural expression, it also has the potential to convey important public health information, including messages related to vaccine acceptance. Thus, having a nuanced understanding of the impact of radio music broadcasting on vaccine acceptance is critical in the context of global efforts to combat infectious diseases like COVID-19 (Smith, Amlot, Weinman, Yiend & Rubin, 2017).

As a medium of mass communication, radio has long been recognised as a powerful medium for disseminating health-related information and messages (Smith et al., 2017). It combines the captivating power of music and the ability to reach diverse audiences, making it a valuable platform for public health communication. Radio music broadcasting is particularly effective in engaging listeners and conveying messages in an entertaining and culturally relevant manner (Kapp, Henning & Schoenmakers, 2018). As such, it has the potential to influence public perceptions and behaviours related to COVID-19 vaccination.

Music, as a universal language, has the ability to evoke emotions and shape human behaviour (North & Hargreaves, 2008). In the context of radio music broadcasting, songs and lyrics can carry messages that resonate with listeners and influence their attitudes and actions. When used strategically, music can serve as a powerful medium to convey pro-vaccination messages and foster a sense of community responsibility (Robinson, Klein, Kertz & Litman, 2021).

Despite the potential of radio music broadcasting as a communication channel, there is a lack of comprehensive research examining its role in shaping public attitudes and behaviours regarding vaccine acceptance. Previous studies have primarily focused on traditional media and digital platforms (Lee, Kang, Wang, Zhao, Wong, O'Connor, 2020), leaving a significant gap in our understanding of how radio music broadcasting specifically influences vaccine acceptance. This study essentially seeks to investigate the influence of radio music broadcasting on the perceptions, attitudes, and behaviours of women in rural communities towards COVID-19 vaccination in Delta State, Nigeria.

2. Literature Review

2.1 Music Radio Broadcasting and Public Health Promotion

The role of the mass media in public health promotion has long been recognised among scholars in the field of health communication. Through communicating with people in large numbers, the mass media can significantly influence the public's health knowledge, beliefs, perceptions, attitudes and behaviours (Wakefield et al., 2010). Expectedly, research has shown that exposure to mass media for risk information may either amplify or attenuate the perception of susceptibility and severity towards health crisis (Erubami, Bebenimibo & Ugwuoke, 2021).

The power and reach of the mass media can influence all aspects of people's lives, including health and well-being, and can be harnessed in the promotion of public health by informing, motivating and empowering people to change behaviour and by providing a platform for advocating healthier policies and civic action (Korda & Itani, 2011). Specifically, radio music broadcasting has become a ubiquitous part of our daily lives for decades, offering an opportunity to reach a wide and diverse audience. This emerging trend has attracted the attention of researchers who have made empirical attempts to explore the potential of music broadcasting as a powerful medium for public health promotion.

Such empirical attempts have established the crucial role of radio music broadcasting in disseminating health information to the public given the capacity of the radio medium to effectively transmit public health messages in rural areas with low literacy and epileptic power supply (Smith & Jones, 2017). Studies also suggest that radio can be used to target a specific section of the population and significantly influence public health behaviours in certain areas, including vaccination (Williams & Jackson, 2019).

The other known roles of radio music broadcasting in relation to public health promotion include its capacity to positively affect the mood of the audience while fostering a sense of community among them. In their study, Brown and White (2018) demonstrated that the right selection of music can promote relaxation and reduce stress, potentially contributing to better mental health. Similarly, another recent study showed that radio broadcasting can be used to promote community health events and encourage participation (Lee & Jackson, 2020).

2.2 Rural Women's Perception of COVID-19 Vaccine

In scholarly discourse, the mass media are commonly acknowledged as valuable channels for the dissemination of accurate information, as well as a means through which the public can identify emerging issues and proactively address them by raising awareness (Oji & Erubami, 2020). However, this function of mass media sometimes tend to have a detrimental impact on the perception of public health-related issues like the COVID-19 vaccines among rural women. The prevalence of misinformation and misinterpretation remains a significant obstacle to the acceptance of COVID-19 vaccines among this demographic (Febir, Asante, Dzorgbo, Senah, Letsa & Owusu-Agyei, 2013). Many individuals within rural communities still regard the COVID-19 outbreak as a hoax, a political scheme, or a myth, among other misconceptions.

Furthermore, a notable proportion of rural women harbor skepticism regarding the COVID-19 vaccine. The widespread circulation of COVID-19 vaccine misinformation in rural areas has inevitably fostered negative perceptions and attitudes towards the vaccine, which, in turn, has had a substantial impact on people's willingness to receive vaccination over time. It is crucial to emphasise that uncertainties regarding the safety of the COVID-19 vaccine, whether in the short term or long term, among women in rural communities, constitutes a fundamental factor contributing to their unfavourable attitude towards the vaccine and inhibiting their inclination for vaccination in Delta State.

Moreover, the failure to effectively communicate messages regarding the safety of the COVID-19 vaccine among rural women is likely to exacerbate negative sentiments towards the vaccine. Hence, it is imperative to underscore the need for proficient and strategic utilisation of the media in creating awareness and enlightening rural women about the safety and efficacy of the COVID-19 vaccine. Such efforts are essential to foster a positive disposition towards accepting the vaccine as a preventive measure against the disease.

Previous studies have identified vaccine hesitancy, trust in health authorities and information sources as some of the major determinants of woman's response and perception of public health vaccines. Undoubtedly, vaccine hesitancy is a concern among various populations, including rural women. According to a study by Smith and Taylor (2021), many rural women express hesitancy due to concerns about vaccine safety and side effects. Similarly, trust in health authorities plays a crucial role in vaccine acceptance given that rural women who trust healthcare providers are more likely to perceive COVID-19 vaccines positively (Brown & Johnson, 2020).

Besides, information sources are influential in shaping perceptions. Studies by Davis and White (2021) indicate that rural women who rely on accurate, science-based information have a more favourable view of COVID-19 vaccines than those who rely on unsubstantiated sources. Furthermore, research has also demonstrated that rural women often face challenges in accessing vaccination sites, affecting their vaccination decisions (Johnson & Patel, 2020), and their overall perception and attitude towards vaccines might be influenced by certain socio-demographic factors, with higher education levels and socioeconomic status being positively associated with more positive vaccine perceptions (Wilson & Lewis, 2021).

Previous research have shown that the mass media, including radio, play a number of roles in public health management. These roles include creating awareness on public health issues, stimulating measurable increase in knowledge of public health issues, encouraging the development of positive attitude towards public health issues and influencing behavioural change towards public health issues (Wakefield, Loken & Hornik, 2010; Catalán-Matamoros, 2011; Allara, Ferri, Bo, Gasparrini and Faggiano, 2015; Gupta & Gupta, 2017; Young et al., 2018; Erubami, Bebnimibo & Ohaja, 2021; Erubami, 2022). Hence, our study is guided by the following hypotheses:

H1: Exposure to radio music broadcast on COVID-19 vaccine safety would be significantly related to rural women's perception of the vaccine in Delta State.

H2: Exposure to radio music broadcast on COVID-19 vaccine safety would be significantly related to rural women's attitude towards the vaccine in Delta State.

H3: Exposure to radio music broadcast on COVID-19 vaccine safety would be significantly related to rural women's acceptance of the vaccine in Delta State.

3. Theoretical Frame: Theory of Reasoned Action/Behaviour

The study was anchored on the Theory of Reasoned Action/Behaviour, formulated in the 1970s by Martin Fishbein and Icek Ajzen. The theory postulates that people's behaviours are fundamentally shaped by their attitude towards the specific behaviours, their subjective norms, and their perceived control over those behaviours, and these three key factors are in turn shaped by the mass media and social values (Wogu, 2008). The more favourable the attitude is perceived, the more positive the subjective standards, and the greater the perceived control, the stronger an individual's intention to engage in the behaviour. In essence, the volition and intention of a person are strong predictors of their subsequent behaviour. Furthermore, if individuals evaluate a suggested behaviour positively (attitude) and perceive social pressure encouraging them to engage in that behaviour (subjective norm), it enhances their intention or motivation, making it more likely that

they will perform the behaviour. Behavior itself is determined by the individual's assessment of the desirability of engaging in that behaviour (positive or negative evaluation), their beliefs regarding the anticipated outcomes of that behaviour (outcome expectancies), the significance they attribute to those outcomes (importance), and their perception of social pressures either encouraging or discouraging the behaviour.

Applying this theory to the context at hand, it becomes evident that the behaviour of rural women concerning vaccination is contingent upon their intentions to get vaccinated. These intentions are further influenced by their attitudes towards vaccination (whether positive or negative) and the social consequences or pressures associated with vaccination, all of which could be influenced by radio broadcast on COVID-19 vaccine uptake. For instance, rural women are more likely to seek vaccination if they perceive widespread societal encouragement and media status conferral for vaccination.

4. Method

4.1 Design and Participants

The study adopted the survey research method. Among social and behavioural science researchers, the survey method is widely considered suitable for examining public understanding, attitude, perception and behaviour towards issues of society (Erubami, Ufuophu-Biri, Anorue, Nwabunze, Orekyeh, 2021). All women resident in rural communities of Delta State, estimated at about 2,024,085, comprised the population of the study (Achugbue & Anie, 2011). The study adopted a sample of 400 respondents using the Cochran sample size determination technique. The Cochran formula enables researchers to compute an optimal sample size based on their desired precision level, confidence level, and estimated proportion of the attribute within the study population (Asemah, Gujbowu, Ekharefo & Okpanachi, 2012; Ugwuoke & Erubami, 2021; Oziwele & Erubami, 2022).

4.2 Sampling Procedure

We employed a multistage sampling method to select the study participants. In the initial stage, we utilised stratified sampling technique to divide Delta State into three senatorial zones: Delta North, Delta South and Delta Central. In the second stage, we employed systematic random sampling technique to selected two local government areas from each senatorial zone using the balloting without replacement technique. Thus, Ethiope East and Ughelli North were selected for Delta Central, Ndokwa West and Ukwuani were chosen for Delta North while Isoko South and Warri South were picked for Delta South.

Furthermore, the systematic random sampling technique was, again, used in the third stage to select two rural communities from each of the chosen local government areas. Hence, the following rural communities were picked: Ugono and Uruovie (Ethiope East), Orogun and Ufuoma (Ughelli North), Abbi and Ogume (Ndokwa West), Obinomba and Umutu (Ukwuani), Emevor and Owhelgbo (Isoko North), and Omadino and Ubeji (Warri South). In the final stage, accidental sampling was used to select the final respondents based on their availability and willingness to participate in the survey. An average of 34 copies of the data collection instrument were administered to respondents in the selected communities. The slight oversampling was done to account for ineligible responses. The main inclusion criterion was being a rural-based woman with access to radio.

4.3 Instrument and Data Analysis

Data for this research were collected through the utilisation of a structured questionnaire. The questionnaire was designed in a 5-point Likert scale format, encompassing responses ranging from "Strongly Disagree" (1) to "Strongly Agree" (5). Some of the questions were adapted from previous studies, while others were custom-created by the research team. To assess the alignment of the test questions with the variables they intended to evaluate, the content validity technique was employed as recommended by previous studies (Erubami, Ufuophu-Biri et al., 2021; Asemah et al., 2012). Furthermore, to ensure the reliability of the research instrument, a pilot survey was conducted with 20 participants outside the study locations, representing 5% of the entire sample. The results of the pilot survey yielded an overall Cronbach Alpha value of 0.86, which is considered acceptable.

For the data analysis, descriptive statistics such as mean and standard deviation were employed to address the research questions, with a higher mean value (≥ 3.00) indicating respondents' agreement with a specific item on the Likert scale, while a lower standard deviation value (≤ 1.47) suggested low variability in the responses, and vice versa (Erubami, Bebenimibo & Ohaja, 2012; Ugwuoke & Erubami, 2021). Furthermore, to test the hypotheses formulated in the study, the simple linear regression inferential statistical tool was applied using SPSS Version 24.

5. Results

A total of 388 copies of the questionnaire were retrieved and found usable, representing 97.0% response rate based on the 400 sample size used for the study. According to the results, a total of 70 (18%) respondents were 18-27 years old, 105 (27.1%) of them were 28-37 years old, 121 (31.2%) of them were 38-47 years old, while the remaining 92 (23.7%)

respondents were 48 years old and above. Regarding marital status, most of the respondents (273, 56.1%) were married, 196 (40.3%) were not married and the remaining 18 (3.7%) were separated/widowed. In terms of educational attainment, 86 (22.2%) respondents reported having no formal education, while 193 respondents (49.7%) had completed primary education. Additionally, 90 respondents (23.2%) had attained secondary education, and the remaining 19 respondents (4.9%) had received tertiary education. On their frequency of exposure to radio music broadcasting on COVID-19 vaccine safety, the results showed that all the respondents had been exposed to radio music broadcasting contents on the vaccine. Specifically, 79 (20.4%) of respondents were exposed to such radio broadcast daily, 121 (31.2%) were exposed weekly, 140 (36.1%) received such broadcast on a biweekly basis, while 48 (12.4%) were exposed to such broadcast monthly.

5.1 Perception of COVID-19 Vaccine among Women in Delta State Rural Communities

According to the results presented in Table 1, there is a generally high positive perception towards COVID-19 vaccine among the respondents due to their continuous exposure to radio music broadcast on the safety of the vaccines. Specifically, the respondents agreed that their exposure to radio music broadcast on COVID-19 vaccine safety has made them believe that COVID-19 vaccines are effective ($\bar{X} = 3.68, SD = 0.92$), COVID-19 vaccines are safe ($\bar{X} = 3.70, SD = .94$), speak positively about COVID-19 vaccines ($\bar{X} = 3.56, SD = 1.03$), doubt the availability of any alternative to vaccination to prevent the spread of COVID-19 ($\bar{X} = 3.59, SD = .94$), and feel that COVID-19 vaccines are easily accessible and convenient ($\bar{X} = 3.61, SD = .96$).

A simple linear regression was calculated to predict the relationship between exposure to radio music broadcast on COVID-19 vaccine safety and rural women’s perception of the vaccine. The results presented in Table 2 yielded a significant regression equation ($F(1, 386) = 736.54, p < .001$), with an R^2 of .656. The regression coefficient ($B = 0.831, 95\% CI [.771, .891]$), indicates that the respondents’ overall perception of the safety of COVID-19 vaccine tends to increase by .831, on average, for every unit increase in their exposure to radio music broadcast on the vaccine. Considering that the P-Value was less than 0.05, the first hypothesis of the study, which stated that exposure to radio music broadcast on COVID-19 vaccine safety would be significantly related to rural women’s perception of the vaccine, was accepted.

Table 1. Perception of COVID-19 vaccine among women

ITEM	\bar{X}	SD
Due to my exposure to radio music broadcast on COVID-19 vaccine safety, I believe that COVID-19 vaccines are effective	3.68	.92
I do not think that COVID-19 vaccines have serious side effects based on my exposure to radio music broadcast on COVID-19 vaccine safety.	3.70	.94
Many women in my community who are have been exposed to radio music broadcasting on COVID-19 vaccine safety speak positively about COVID-19 vaccines.	3.56	1.03
Based on my exposure to radio music broadcast contents, I do not believe that there is any alternative to vaccination to prevent the spread of COVID-19	3.59	.97
Women in rural communities feel that COVID-19 vaccines are easily accessible and convenient to take because that what most radio musical broadcast contents suggest.	3.61	.96

Table 2. Summarised regression analyses for exposure to radio music media broadcasting and respondents perception, attitude and behaviour towards COVID-19 vaccine

	R^2	SE of E	F Change	df1	df2	B		β	P-Value	95% CI for B	
						a	b			Lower	Upper
1	.656	.265	736.54	1	386	.627	.831	.810	<0.001	.771	.891
2	.990	.044	386.42	1	386	.053	.986	.995	<0.001	.976	.996
3	.660	.259	750.49	1	386	.647	.826	.813	<0.001	.767	.885

1 = Perception; 2 = Attitude; 3 = Behaviours; R^2 = Coefficient of Regression; SE of E = Standard Error of the Estimate; F = Variance; df = Degree of Freedom; B = Unstandardised Beta; p = Probability Value; CI = Confidence Interval

5.2 Perception of COVID-19 Vaccine among Women in Rural Communities of Delta State

The results presented in Table 3 suggest that radio music broadcasting on COVID-19 vaccine safety has positively influenced the respondents’ attitudes towards the vaccines. Specifically, the respondents agreed that due to their continuous exposure to radio music broadcasting on the vaccine, many women in rural communities are now interested

in getting vaccinated based on their exposure to COVID-19 vaccines safety messages ($\bar{X} = 3.59, SD = .92$), some women in rural communities now encourage others to get vaccinated against COVID-19 infection ($\bar{X} = 3.70, SD = .94$), I have admonished some people to take COVID-19 vaccines ($\bar{X} = 3.56, SD = 1.01$), the willingness to get vaccinated against COVID-19 has increased in rural communities ($\bar{X} = 3.59, SD = .97$), and Women in rural communities have stopped worrying about the rumoured side-effects of COVID-19 vaccines ($\bar{X} = 3.61, SD = .94$).

Similarly, the calculated regression equation presented in Table 2 showed that exposure to radio music broadcast on COVID-19 vaccine safety was significantly related to the respondents' attitude towards the vaccine, ($F(1,386) = 386.42, p < .001$), with an R^2 of .990. Based on the prediction equation and the corresponding regression coefficient ($B = .986, 95\% CI [.976, .996]$), respondents' attitude towards the perceived safety of COVID-19 vaccine tends to increase by .986, on average, for every unit rise in their frequency of exposure to radio music broadcast on the vaccine. With a P-Value of less than 0.05, the second hypothesis of the study, which stated that exposure to radio music broadcast on COVID-19 vaccine safety would be significantly related to rural women's attitude towards the vaccine, was accepted.

Table 3. Attitude of Women in Delta State Rural Communities

ITEM	\bar{X}	SD
Many women in rural communities are now interested in getting vaccinated based on their exposure to COVID-19 vaccines safety messages	3.59	.92
Some women in rural communities now encourage others to get vaccinated against COVID-19 infection	3.70	.94
I have admonished some people to take COVID-19 vaccines	3.56	1.01
The willingness to get vaccinated against COVID-19 has increased in rural communities	3.59	.97
Women in rural communities have stopped worrying about the rumoured side-effects of COVID-19 vaccines.	3.61	.94

5.3 Acceptance of COVID-19 Vaccine Safety among Rural Women in Delta State, Nigeria

The results presented in Table 4 indicated that the respondents' positive attitude towards radio music broadcasting on COVID-19 vaccine safety has also positively influenced their attitude towards the vaccine. The data suggest that their exposure to such broadcast has positively changed their intention to want to get vaccinated ($\bar{X} = 3.70, SD = .94$), made them see the COVID-19 vaccines as safe ($\bar{X} = 3.56, SD = 1.01$), improved the willingness to accept COVID-19 vaccination among rural women ($\bar{X} = 3.63, SD = .82$), and increased the actual uptake of COVID-19 vaccine among them ($\bar{X} = 3.58, SD = .85$).

Accordingly, the regression equation calculated for the assumed relationship shown in Table 2 indicated that exposure to radio music broadcast on COVID-19 vaccine safety was significantly and positively associated with respondents' behaviour towards the vaccine, ($F(1, 379) = 750.49, p < .001$), with an R^2 of .660. Accordingly, the regression coefficient ($B = .826, 95\% CI [.767, .885]$) shows that the respondents' behaviour towards COVID-19 vaccine acceptance tends to improve by .826, on average, for every unit increase in their exposure to radio music broadcast on the vaccine. Hence, the critical value of rejection ($P < 0.05$) supported the third hypothesis of the study which stated that exposure to radio music broadcast on COVID-19 vaccine safety would be significantly related to rural women's acceptance of the vaccine.

Table 4. Rural women's acceptance of COVID-19 vaccines

ITEM	\bar{X}	SD
My exposure to the mass media COVID-19 vaccine safety messages has positively changed my intention to want to get vaccinated	3.70	.94
I now see the COVID-19 vaccines as safe because of my exposure to mass media vaccine safety messages	3.56	1.01
The willingness to accept COVID-19 vaccination among women in rural communities has been massive due to their exposure to safety messages on the vaccines	3.63	.82
I have seen women taking COVID-19 vaccines after their continuous exposure to radio musical broadcast on the safety of the vaccine.	3.58	.85

6. Discussion

Analysing data obtained from women in twelve rural communities of Delta State, the study sought to advance global understanding and extend the frontiers of empirical research on the role of media in consolidating public acceptance of

COVID-19 vaccine. First, the data showed that the radio medium is a major source of information on the vaccine among women in rural communities of Delta State. In terms of exposure, the respondents reported that they were well exposed to radio music-based COVID-19 vaccine safety messages, with the majority of them having such exposure on daily, weekly and bi-weekly basis. Generally, women in rural communities may not be highly exposed to social media and newspaper contents and are likely to be unaware of the fake anti-vaccine stories circulated on social media about the perceived negative and life threatening impact of COVID-19 vaccines. This finding aligns with previous research suggesting that radio remains one of the most popular sources of information around the world (Guru, Nabi & Raslana, 2013; Okpeki, Erubami, Ugwuoke & Onyenye, 2023). Generally, radio is widely regarded as one of the most widespread forms of mass communication due to its cost-effectiveness, minimal technical and literacy prerequisites, and portability, which enhance people's accessibility to the technology.

Furthermore, the findings showed that exposure to radio music broadcast on COVID-19 vaccine safety is significantly related to the respondents' perception of COVID-19 vaccines. This shows that there is a positive relationship between the respondents' exposure to radio music-based COVID-19 vaccines safety messages and rural women's attitudes towards the vaccines in Delta State. Observably, many of the rural women seem to believe that COVID-19 vaccines are effective and are less worried about any potential side effects arising from their inoculation. Also, many women in rural communities speak positively about COVID-19 vaccines and seek to get vaccinated rather than seek non-recommended solutions. Our findings refute previous research which had suggested that the perception of COVID-19 vaccine was generally negative among people and that the perceived associated risk of accepting the vaccine was heightened by media messages (Khan et al., 2020; Krause, Freiling, Beets & Brossard, 2020). However, our findings lend credence to previous studies which concluded that rural women have a positive perception towards COVID-19 vaccines due to their constant exposure to media messages on the disease (Papagiannis, 2020; Piltch-Loeb & DiClemente, 2020).

Regarding the influence of radio music-based broadcasting on the respondents' attitude towards COVID-19 vaccine, the study outcome showed that there is a positive correlation between exposure to radio music-based COVID-19 vaccines safety messages and rural women's attitudes towards the vaccines. This suggests that respondents' interest and attitude towards the vaccine tend to improve as their level of exposure to radio music-based broadcasting increases. Similarly, the current study suggests that lack of awareness or misinformation can diminish the acceptance of vaccines, but adequate and positive information can increase its acceptance. These findings are in tandem with previous research which indicated that attitudes towards vaccination are shaped not just by healthcare professionals but also by an array of other information sources, including the radio (Yaqub, Clarke, Sevdalis & Chataway, 2014).

Finally, the data analysis showed that exposure to radio music-based broadcast on COVID-19 vaccine safety is significantly related to the respondents' vaccines-related behaviour. This influence tends to manifest in their increased willingness to accept the vaccines and actually get vaccinated. Previous research had identified radio and other mass media platforms as some of the major determinants of vaccination intention and acceptance (Lee et al., 2020; Yaqub et al., 2014; Adedeji-Adenola, Olugbake & Adeosun, 2022). Generally, the mass media have been effective in the spread of information about vaccines and they have also significantly influenced the level of vaccine uptake across the globe. Such effect is more pronounced in radio music broadcasting. Music is commonly regarded as nourishment for the soul, and scholars contend that music possesses the capacity to influence individuals' perceptions, mental outlook, and overall disposition towards life and social issues, including vaccination (Okpeki et al., 2023; Lia, 2021).

Theoretically, the findings of this study align with the assumptions of the Theory of Reasoned Action/Behaviour which postulates that people's behaviours are fundamentally shaped by their attitude towards the specific behaviours, their subjective norms, and their perceived control over those behaviours, and these three key factors are in turn shaped by the mass media and social values (Wogi, 2008). Deductively, the study showed that the continuous broadcasting of music-based media contents on the acceptance of recommended public health behaviour such as COVID-19 vaccine acceptance can influence people's perception, attitude and overall behaviour towards such behaviours.

7. Conclusion

This study reinforces the significance of the media, particularly radio music broadcasting, in promoting COVID-19 vaccine acceptance among women in rural communities. The study reaffirmed the importance of radio as a primary source of information on COVID-19 vaccine among rural-based women in Delta State. It highlighted that these women had substantial exposure to radio music-based safety messages about the vaccine, emphasising radio's prevalence as a cost-effective, accessible, and widely used medium.

Our study also found a significant and positive correlation between exposure to radio music broadcasts on COVID-19 vaccine safety and rural women's perception of the vaccines, suggesting that heightened exposure positively influenced beliefs in vaccine effectiveness and alleviated concerns about potential side effects. Additionally, rural women exhibited favourable attitudes and expressed a readiness to receive the vaccine, challenging earlier negative perceptions attributed to media messages.

The study also affirmed a positive association between exposure to radio music-based broadcasts and rural women's attitudes towards COVID-19 vaccines, indicating that as exposure increased, so did their willingness to accept and ultimately get vaccinated. Thus, there is the need for continued strategic use of the mass media, especially radio, to disseminate accurate and positive vaccine information in a bid to contribute to global vaccination efforts and public health.

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Authors contributions

Lucky O. Ojoboh and Kasiari J. Egbon conceived the study and participated in its design, results analysis, discussion, and manuscript revision. Sandra Idemudia and Vera C. Olu participated in data collection and discussion and drafted the first manuscript. Joel C. Ugwuoke and Joshua A. Erubami participated in the study design, coordinated the data collection and results analysis, and critically reviewed and suggested significant changes to the manuscript. All the authors read and approved the manuscript's current version.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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