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EXPOSURE TO AND ADOPTION OF COVID-19 PREVENTION CAMPAIGN MESSAGES AMONG RESIDENTS OF SOUTH-EAST NIGERIA AND THE ASSOCIATED CONSTRAINT FACTORS

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ABSTRACT

This study examined exposure to/adoption of COVID-19 prevention campaign messages (PCM) among Southeast Nigeria residents and the associated constraint factors (ACF). The study adopted a survey research method, and used the questionnaire to collect data from 663 respondents selected from the Southeastern states using multi-stage sampling. Data were analysed using descriptive statistics (frequency, percentage, mean, and chi-square). The finding reveals a significant/positive relationship between education and exposure to COVID-19 PCM ($\mathbf{X^2}$=24.29, p- value= 0.00). The residents were majorly exposed to information on the use of face masks ($\bar{X}$=1.55±0.74), disinfection of high-contact surfaces ($\bar{X}$=1.35±0.60), and avoidance of crowded/poor ventilated spaces ($\bar{X}$=1.31±0.66); through social media ($\bar{X}$=1.55±0.74), television ($\bar{X}$=1.35±0.60), Family/Friends/Neighbours ($\bar{X}$=1.31±0.66), and radio ($\bar{X}$ =1.12±0.66). There was a positive/significant relationship between the respondents' exposure to the COVID-19 PCM and their adoption of the messages ($\mathbf{X^2}$=4.59, p- value= 0.03), especially in the use of face masks ($\bar{X}$=1.14±0.86), not touching of eyes and nostrils with fingers ($\bar{X}$=1.48±0.73), not hugging and giving handshakes ($\bar{X}$=1.23±0.78), and promoting same among family and neighbours ($\bar{X}$=1.23±0.78). However, constraint factors were the difficulty in practising physical distancing (=1.57±0.72) and the need to work daily to provide food for the household (=1.27±0.69). The study concludes by emphasising the significant lessons from the campaign on the type and nature of health communication that would work or not in Southeast Nigeria during health emergencies such as the COVID-19 pandemic; and recommended increased use of social media, television, and radio in promoting health-related issues while eliminating other ACFs.

Keywords: Adoption, Constraint factors, COVID-19 pandemic, Exposure, Prevention, South-east residents, Nigeria

Introduction

The emergence of the COVID-19 pandemic which necessitated both total and partial lockdowns between 2019 and 2021 brought about significant challenges to the health systems in many nations across the globe including developing countries like Nigeria which is often plagued with weak health systems. As of

September 2021, Nigeria had recorded 214,513 confirmed cases of COVID-19; 207,403 cases of discharged patients of the virus and 2,980 cases of death due to the virus (NCDC, 2021).

While the virus was ravaging the world, health professionals and scientists were committed to understanding the dynamics of the virus, promoting possible preventive measures and searching for cures or possible vaccines against the virus. To this end, information sharing became a necessity globally and Nigeria in particular which was rated by the World Health Organization (WHO) as the 13th high-risk African country concerning the spread of the virus (Ndubuisi-Okoroezi et al., 2022).

Among the top health communication agenda was disseminating information on preventive measures against the spread of the virus. Most communication channels, either conventional mass media like radio, TV, newspaper, magazine, etc.; or social media platforms like Facebook, WhatsApp, Twitter, Instagram, and TikTok as well as channels of communication like face-to-face among others were deployed in disseminating information concerning the infection update, and stipulated prevention methods such as hand-washing, physical distancing, use of face-mask, among others (Akinmayowa & Amzat, 2020).

According to Nwakpu et al (2020), media responsibilities during the pandemic went beyond the conventional journalism of coverage and reporting events as they unfolded. It extended to social education and mobilization against the spread of the COVID-19 virus through strategic promotion of virus prevention methods.

Understanding the extent to which the promoted preventive measures were adopted among the residents in South-Eastern Nigeria is key to appreciating what worked and what did not work in such a period of health emergency. The thrust of this study therefore is to ascertain the extent to which South-Eastern Nigeria residents were exposed to the COVID-19 prevention campaign; and the extent to which they adopted the COVID-19 prevention campaign messages (PCMs).

Also, this study thrived to understand factors that affected their adoption of COVID-19 PCMs. These are essential for informing public health strategies and interventions for managing similar health emergencies in the future. Specifically, this study was guided by the following research questions:

1. What is the extent of exposure of Southeast residents to COVID-19 PCMs?
2. To what extent did they adopt the COVID-19 PCMs?
3. What factors affected their adoption of the COVID-19 PCMs?

Theoretical Framework

Theoretically, this study is hinged on the Agenda-Setting Theory and the Health Belief Model. The Agenda-Setting theory was propounded by Maxwell McCombs and Donald Shaw in 1968. It was inspired by the earlier work of Walter Lippman in 1922 in his book titled "The Public Opinion" in which he submits that the mass media have a system of constructing the public perception and preferences. By advancing on Lippmann's postulation, (McCombs and Shaw) postulated the Agenda Setting Theory to connote that the mass media determine what people think and worry about.

According to Defleur and Dennis (1989), the basic assumptions of the agenda-setting theory are summarised thus:

(i) the press and the media do not reflect reality; they filter and shape it and
(ii) (ii) Media concentration on a few issues and subjects lead public to perceive those issues as more important than other issues.

In terms of criticism of the Agenda Setting Theory, the first angle of weakness identified with the Agenda Setting hypothesis is its over simplistic and scientific approach which negates the unpredictable

nature of man. With the recognition of human differences and diversity of motives, there is a valid tendency that what one perceives to be significant may be insignificant to another. Therefore, the submission that all will see an issue or item from the media light is negotiable (McWilliams, et al, 2022).

Secondly, standing on the basis of the selectivity theory, an individual's preference for media content is another determinant factor in the selection of what to view, accept or adopt. Audiences also have a level of prejudices. They often perceive the importance of an issue based on their preferences, interest and their perception of the objectivity and credibility of the source it is coming from. Therefore, an audience may not accept a media content's level of significance if it is coming from a source that is not in consonance with his or her predisposed preferences or prejudices (O'Boyle & Haq, 2021).

Despite the apparent weakness mentioned above, the theory is relevant to this study as it is expected that health communication experts or media set an agenda on COVID-19 which could influence the acceptance, appreciation and or compliance with the prevention directives by the government and health bodies. This area of interest should relate to informing, educating and mobilising them for COVID-19 vaccination which is a prerequisite for the achievement of the control and eradication of the virus.

This is achievable through prioritization of COVID-19-related media content and programmes. With increased frequency and priming of COVID-19 health-related messages, it is believed that the people of South-East states will be prompted to accept the knowledge of COVID-19 dangers and the vaccination as a way of eradicating them. However, even when exposed to COVID 19 messages, adoption of health information on COVID 19 is often dependent on their belief as explained in the Health Belief Model.

The Health Belief Theory or Model (HBM) was developed in the early 1950s by social psychologists Hochbaum, Rosenstock, and Kegels, who were working in the U.S. Public Health Services. The model was created in response to the failure of a free Tuberculosis (TB) health screening program. Since then, the model has been widely used for nearly half a century to promote various health behaviours, such as increased condom use, seat belt use, adherence to medical treatments, and utilization of health screenings.

The HBM is based on the premise that individuals are more likely to engage in health-related actions if they believe that taking those actions will help them avoid negative health conditions. They must also have a positive expectation that the recommended actions will effectively prevent negative health outcomes. Additionally, individuals must have confidence in their ability to successfully carry out the recommended health actions.

In essence, the Health Belief Model provides a framework for motivating individuals to take positive health actions by appealing to their desire to avoid negative health consequences. It can be an effective tool for developing health education strategies. The core assumptions of the Health Belief Model are: Individuals attach significant importance to maintaining good health and recovering from illnesses; this strong value prioritization drives a high level of compliance when individuals are provided with preventive or curative advice; effective advice should effectively communicate the severity of the illness to convince individuals of its potential impact; and the advice needs to convincingly demonstrate that the recommended action will effectively prevent or cure the illness (Mbiereagu & Etumnu, 2020).

The Health Belief Model mainly deals with health risk behaviours and might not fully capture the environmental, social, and individual factors that affect the health conditions. Beliefs can influence a person's decision to engage in risky behaviours, but may not necessarily determine if someone develops a certain health condition for instance lung cancer. This model is worthwhile as it helps health care professionals in creating educational and awareness programmes meant to alter behaviour. Nevertheless, these tests do not play a role in developing our knowledge regarding the management of various diseases or disorders.

Despite the stated criticisms of the Health Belief Model, the study still adopts it on the basis that its core assumptions explain the rationale for which people would opt for corona virus preventive measures such as vaccination despite the conspiracy against it as to why some may or may not consider it despite the loud advocacy by the government.

The role of the model in this study is also to help understand the health behaviour of individuals so as to transform their perception, knowledge and behaviour through effective health communication strategies for the prevention of the spread and contamination of the COVID-19 virus in the South-Eastern state of Nigeria. The analysis of health messages and sensitization on the coronavirus will be assessed by its contributions to the improvement of the health benefit of the people in these stated states of Nigeria. Likewise, the benefit of HBM is it provides a significant ground for health communication planning on COVID-19 prevention (cues to action) by putting into adopting its core assumption. This can lead to the absolute transformation or change of behaviour either at the individual, family or societal levels.

Materials and Methods

Design

This study is a cross-sectional quantitative descriptive survey. Creswell opines that the survey method is best adopted for an assessment of characteristics, attitudes, or behaviour of a social group as this study tried to do (Creswell & Creswell, 2013).

Study Population, Sample Size, and Techniques

The population of this study is 3,750,833 residents of the selected states' capital cities (Abia, 817,383; Anambra, 748,900; Ebonyi, 460,300; Enugu, 1,060,500; and Imo, 663,750). This was obtained using the National Population Commission (NPC) (2006). According to the NPC statistics, the five states' capitals have a population of 2,268,867 residents with an annual growth rate of 3.2%. The population was therefore projected for 17 years (2006-2022) as seen in Table 1. From the above population, a sample of 663 respondents was drawn using the Krejcie and Morgan (1970) sample size determination table.

Multi-stage sampling technique was adopted in selecting the actual respondents who eventually filled the copies of the questionnaire. In the first stage, the researchers purposively selected only the capital cities of the five states given that the capital city houses residents who were predominantly literate and possibly have greater access to the COVID-19 PCMs. All the 14 local government areas (3 per state except Ebonyi with 2) designated as part of each of the state capitals were included in the study as seen in Table 1.

In the second stage, the researchers stratified the capitals into developed and developing Local Government Areas (LGAs). The developed LGAs are the ones that house the seat of power where most of the state's administrative and development activities are performed; while the developing LGAs are those in the suburbs with minimal development and state administrative presence as also seen in Table 1.

In the third stage, the researchers employed a random sampling technique to select two electoral wards from each of the core LGAs (see Table 1). The names of all the wards were written on pieces of paper, rolled up, mixed thoroughly, placed in a basket, and then picked the first two randomly for each of the developed LGAs. However, three wards were selected for Ebonyi state which has only two LGAs to make up for the shortfall.

For the developing LGAs, the researchers applied a purposive sampling technique to avoid the error of selecting wards that are extremely rural within the capital city. As such, the first two most developed wards in each of the developing LAGs were included. However, three wards were selected for the developing LGA in Ebonyi state to make up for the shortfall. This means 30 wards (11 from the developed LGAs and 19 from the developing LGAs) were selected for the study as seen in Table 1.

In the fourth stage, the researcher adopted a proportional sampling technique to distribute the instrument among the selected wards (see Table 1). This was necessary to eliminate possible sampling bias.

In the fifth stage, the researchers purposively selected the most prominent community (the community with the highest population and physical infrastructure) for the administration of the instruments as they were more likely to be more enlightened and exposed to information on COVID-19 who could provide reliable and usable data for the study. In each of the selected communities, the researchers purposively commenced sampling from the most populated street to the least populated in an interval of 3 households until the copies of the questionnaire meant for the ward were completely exhausting.

In a household with more than one qualified and willing respondent, the researchers subjected them to 'yes' or 'no' balloting and the first to pick yes in the household was sampled. In the instances where the 3rd household did not have any qualified or willing respondent readily available, the researcher would pick the next household that satisfies the inclusion criteria and commence the counting of the 3rd house interval from there until the last copy of the questionnaire would have been exhausted in the community. This process was repeated until the required sample size was met based on the distribution quotas.

Table 1: Stratification of Selected LGAs and Wards within the State Capitals

Core LGAs within the capital (Population in Bracket)	**Selected Wards**	**Sample**	**Low Brow LGAs within the capital (Population in Bracket)**	**Selected Wards**	**Number of Questionnaire**	**Total per State**
Umuahia North (371,000)	Ndume	35	Ikwuano (215,383)	Oloko I	21	
	Ibeku West	29		Ibere II	18	
			Umuahia South (231,000)	Omaegwu	22	144
				Old Umuahia	19	
Awka South (315,500)	Nise I	24	Awka North (186,700)	Isu aniocha	19	
	Awka II	31		Amansea	15	132
				Enugu-Agidi I	22	
			Njikoka (246,700)	Nawfia II	21	
Abakaliki (248,800)	Abakpa	18	Ebonyi (211,500)	Agalegu	11	
	Azuiyiokwu layout	12		Ndiebo	14	
	Azuiyiudene Layout	14		Ndiegu	13	83
Enugu North (402,500)	Independence Layout	38	Enugu South (329,000)	Maryland	25	
				Uwani West	33	187
	New Haven	33	Enugu East (329,000)	Trans Ekulu	22	
				Abakpa I	36	

Owerri-Municipal (201,750)	Azuzi I G.R.A	18 17	Owerri North (293,000) Owerri West (169,000)	Naze Emmi Okuku Nekede	25 28 15 14	117
Total	**11**	**246**			**205**	**663**

Inclusion and Exclusion Criteria

The inclusion criteria for this study were that the respondent must have been a resident in any of the Southeastern states of Nigeria during the COVID-19 lockdown; resided in any of the selected LGAs, wards, and communities within the study period; was an adult of 18 years and above during the lockdown; and was willing to participate in the survey. Anything contrary to the above was excluded from the sample.

Instrument of Data Collection

The data were collected using a structured questionnaire that was structured into four sections. Section 'A' for the demographic makeup of the respondents; 'B' contained questions on the respondents' exposure to COVID-19 PCMs; 'C' focused on their adoption of the campaign messages, and 'D' focused on the possible constraint factors.

Reliability of Instrument

The pre-test reliability method and Cronbach's alpha were used. A pilot study was conducted on Tuesday, 14th February 2023, and the re-test was conducted on Tuesday, 28th February 2023. The data were analyzed using the SPSS and the result suggested an 85% validity before the actual study.

Method of Data Analysis

The data were analyzed using descriptive statistics like frequency count, percentages, mean; and Chi-Square with the aid of SPSS version 23.

Results and Discussion

Results

Exposure to COVID-19 Prevention Campaign Messages among the Residents

A total of 663 copies of the questionnaire were administered. Out of this, 632 copies representing 95.3% were retrieved and considered usable for the analysis, while 31, representing 4.7% were not retrieved or were retrieved but wrongly filled. Given this, the study's discussion and conclusion were based on the valid retrieved copies of the instrument.

Table 2 shows the data generated on the respondents' demography and exposure to COVID-19 PCMs and indicates that the majority of the respondents (86.3%) were low-income earners (≤#6,666 or less than 6 USD a day); educated up to and above secondary school level (83.9%); within their productive and active age (18-50 years) (75.6%); male (74.4%); and married (51.6%).

Table 2 also reveals a significant and positive relationship between the educational level of the respondents and their exposure to COVID-19 PCMs ($\mathbf{X^2}$=24.29, p- value= 0.00) in South East Nigeria. This means the more educated a resident in the geopolitical zone is, the more he or she would be exposed to the COVID-19 PCMs. However, Age, marital status and level of income have a positive but insignificant relationship with exposure to COVID-19 PCMs among the residents.

Table 2: Distribution of Respondents According to Demographic Characteristics and Exposure (N= 632)

Variables	**Frequency**	**Percent**	**X^2**	**Df**	**p=value**	**Remarks**
Age (Years)			**2.48**	**2**	**0.29**	**Not Significant**
18 – 30	234	38.4				
31 – 50	235	37.2				
≥51	154	24.4				
Sex						
Male	470	74.4				
Female	162	25.6				
Marital status			**2.73**	**3**	**0.44**	**Not Significant**
Single	239	37.8				
Married	326	51.6				
Divorced/ Separated	43	6.8				
Widowed	24	3.8				
Educational Qualification			**24.29**	**6**	**0.00**	**Significant**
No formal education	25	4.0				
Primary education	24	3.8				
Secondary education	53	8.4				

NCE/OND	106	16.8				
B.Sc/HND	161	25.5				
Master's degree	203	32.1				
Ph.D.	60	9.5				
Occupation						
Unemployed	36	5.7				
Student	179	28.3				
Farmer	104	16.5				
Civil servant	113	17.9				
Trader	138	21.8				
Artisan	62	9.8				
Income (₦)						
≤100,000	255	40.3				
100,001 - 200,000	291	46.0				
≥200,001	86	13.6				

Source: Field survey, 2023

Table 3 shows the weighted mean score of respondents' exposures to COVID-19 PCMs and reveals that they were predominantly exposed to information on the need to regularly wear face masks that are made up of two or more layers of washable, breathable fabric that completely cover the nose and mouth ($\bar{x}$ =1.55±0.74), regular disinfection of high-contact surfaces ($\bar{x}$=1.35±0.60), and avoiding crowded/poor ventilated spaces ($\bar{x}$=1.31±0.66). However, the campaign message on performing hand hygiene like regularly washing hands ($\bar{x}$=1.12±0.66), keeping at least 2 meters distance away from the symptomatic person ($\bar{x}$= 0.77±0.82), and monitoring symptoms and visiting healthcare facilities when sick ($\bar{x}$ =0.23±0.61) were not very popular with the respondents.

Table 3: Exposure to Covid-19 Prevention Campaign Messages and Channels of Communication (n = 632)

Preventive Measures	Mean ($\bar{x}$)± S.D	Rank
Wearing of face mask	1.55±0.74	1st
Keeping at least 2m distance away from symptomatic person	0.77±0.82	5th
Avoiding crowded spaces and spaces with poor ventilation	1.31±0.66	3rd
Performing hand hygiene	1.12±0.66	4th
Regularly disinfecting high-contact surfaces	1.35±0.60	2nd
Monitoring symptoms and visiting Healthcare facility when sick	0.23±0.61	6th
Channel of information on COVID-19 pandemic		
Family/Friends/Neighbours	1.31±0.66	3rd
Radio	1.12±0.66	4th
Television	1.35±0.60	2nd
Newspaper/Magazine	0.77±0.82	5th
Social media	1.55±0.74	1st
Billboard	0.23±0.61	9th
Doctors/Nurses	0.66±0.82	6th
Text messages	0.36±0.71	7th
Religious leaders	0.24±0.52	8th

Source: Field survey, 2023

The various channels of communication through which the respondents were exposed to COVID-19 PCMs were equally identified in Table 3 above. The result showed that social media ($\bar{x}$=1.55±0.74), television ($\bar{x}$=1.35±0.60), Family/Friends/Neighbours ($\bar{x}$=1.31±0.66), and radio ($\bar{x}$=1.12±0.66) were the dominant sources of information among the respondents. However, Billboard ($\bar{x}$= 0.23±0.61) was the least popular source of information on the COVID-19 PCMs followed by religious leaders ($\bar{x}$= 0.24±0.52), text messages ($\bar{x}$= 0.36±0.71) and doctors/nurses ($\bar{x}$= 0.66±0.82).

Adoption of COVID-19 Prevention Campaign Messages

Table 4 suggests a positive and significant relationship between the respondents' exposure to the COVID-19 PCMs and their adoption of the prevention measures ($\boldsymbol{X^2} = 4.59, p - value = 0.03$). However, the table reveals that adoption of COVID-19 PCMs was high only in: the use of face masks whenever they were outdoors ($\bar{x} = 1.14 \pm 0.86$), consciously avoiding touching the eyes and nostrils with their fingers, and disinfecting high contact surfaces ($\bar{x} = 1.48 \pm 0.73$), avoiding hugs and handshake with people ($\bar{x} = 1.23 \pm 0.78$), promoting the observation of the COVID-19 preventive measures among family and

neighbours ($\bar{x} = 1.23 \pm 0.78$), and non-reliance on non-scientific measures like depending on prayers to protect them from the COVID-19 ($\bar{x} = 0.49 \pm 0.75$).

Table 4: Adoption of Covid-19 Prevention Campaign Messages among Respondents (n = 632)

	COVID-19 prevention messages	$Mean\ (\bar{x}) \pm S.DX^2$	Df	p-value	Remark
i.	Wore face mask	1.14±0.86			High
ii.	Practised physical distancing	0.57±0.81			Low
iii.	Avoided crowded spaces/poor ventilation	0.55±0.75			Low
iv.	Washed my hands with hand sanitisers	0.68±0.70			Low
v.	Avoided touching eyes/nostrils with fingers	1.48±0.73			High
vi.	Avoided hugging and shaking hands with people	1.23±0.78			High
vii.	Encouraged family and neighbours to observe				
viii.	the Covid-19 preventive measures.	1.23±0.78			High
ix.	Strictly relied on prayers to protect me and				
	my family from COVID-19	0.49±0.75			Low

Relationship between Exposure and Adoption of COVID-19 PCMs among the Respondents Adoption of prevention messages

Adoption of prevention messages	4.59	1	0.03	Sign

Note: Mean **($\bar{x}$)** < 1 = Low adoption and Mean **($\bar{x}$)** ≥ 1 = High adoption Df= Degree of freedom

Source: Field survey, 2023

Associated Constraint Factors

Table 5 below shows the factors that affected Southeast residents' adoption of the COVID-19 PCMs and revealed that the difficulty in practicing physical distancing in public worship places and public transport ($\bar{x}$=1.57±0.72), and the need to work daily to provide food for the household ($\bar{x}$=1.27±0.69) were the identified major constraints.

The identified minor constraints were alleged government officials' non-compliance with the PCMs($\bar{x}$=0.90±0.82), the discomfort that comes with wearing of face mask ($\bar{x}$=0.85±0.76), lack of access to stable running water ($\bar{x}$=0.83±0.73), and lack of conviction in the existence of COVID-19 in Nigeria ($\bar{x}$=0.38±0.68).

Table 5: Constraints to Adherence to COVID-19 Prevention Campaign Messages among Respondents (n-632)

S/N	Constraints to Adherence to COVID-19 PCMs	Mean ($\bar{x}$)±S.D	Remark
i.	I did not pay attention to the promoted Covid-19 preventive measures because I never believed there was COVID-19 in Nigeria	0.38±0.68	Minor
ii.	I decided to ignore the preventive measures when I saw that Government officials were not observing them	0.90±0.82	Minor
iii.	Wearing a face mask is very uncomfortable	0.85±0.76	Minor
iv.	The need to work daily to provide food made physical distancing difficult to practice	1.27±0.69	Major
v.	It is difficult to practice physical distancing in the church and public transport	1.57±0.72	Major
vi.	Washing hands under running water was difficult since I did not have access to running water.	0.83±0.73	Minor

Note: Mean($\bar{x}$) < 1 = Minor constraint and Mean ($\bar{x}$) ≥ 1 = Major constraint.

Source: Field survey, 2023

Discussion

This study examined the Southeast residents' exposure to COVID-19 PCMs, their adoption of the PCMs, and the associated constraint factors. Given the first objective, the study revealed that the residents were predominantly exposed to information on the need to regularly wear face masks that are made up of two or more layers of washable, breathable fabric that completely cover the nose and mouth ($\bar{x}$=1.55±0.74), regular disinfection of high-contact surfaces ($\bar{x}$=1.35±0.60), and avoiding crowded/poorly ventilated spaces ($\bar{x}$=1.31±0.66).

However, the campaign messages like performing hand hygiene such as regularly washing hands ($\bar{x}$=1.12±0.66), keeping at least 2 meters distance away from the symptomatic person ($\bar{x}$= 0.77±0.82), and monitoring symptoms and visiting healthcare facilities when sick ($\bar{x}$=0.23±0.61) were not popular among the residents. Findings also revealed that the Southeast residents' exposure to the campaign was positively and significantly influenced by their level of education ($\mathbf{X^2}$=24.29, p- value= 0.00); and occurred mostly through social media ($\bar{x}$=1.55±0.74), television ($\bar{x}$=1.35±0.60), Family/Friends/Neighbours ($\bar{x}$ =1.31±0.66), and radio ($\bar{x}$=1.12±0.66).

The findings support Wakefield et al's (2010) report that suggests a high level of access to health messages through the media like radio and television; Soremekun's (2012) report of a significant level of exposure to HIV/AIDs media messages through the use of radio (Radio Emashie, Pokuase, and Radio Peace, Winneba) programmes; and John's(2012) study of health programming and community-based radio stations in Sub-Sahara Africa which revealed that the majority of the participants had a high level of exposure to radio for over three hours consistently and agreed to get their health information from Namwianga Radio majorly. These findings imply that the COVID-19 prevention campaign was successful in reaching the target audience in Southeast Nigeria and emphasized the relevance of education, use of social media, television, radio and word-of-mouth in future health promotion campaigns in the area.

The second objective of the study was to ascertain the adoption of COVID-19 PCMs among the Southeast residents in Nigeria and revealed that even though there was a positive and significant

relationship between the respondents' exposure to the COVID-19 PCMs and their adoption of the messages (**X^2=**4.59, p- value= 0.03), adoption of COVID-19 PCMs was high only in: the use of face masks whenever they were outdoors ($\bar{x}$=1.14±0.86), consciously avoiding touching the eyes and nostrils with their fingers and disinfecting high contact surfaces ($\bar{x}$=1.48±0.73), avoiding hugs and handshake with people ($\bar{x}$ =1.23±0.78), and promoting the observation of the COVID-19 preventive measures among family and neighbours ($\bar{x}$=1.23±0.78), and non-reliance with non-scientific measures like depending on prayers to protect them from the COVID-19 ($\bar{x}$=0.49±0.75).

However, adoption was low in physical distancing, avoidance of crowded spaces and spaces with poor ventilation, and hand sanitization/washing. This finding supports Brown's (2020) report that media promotion of COVID-19 prevention measures led to a significant reduction in the risk of contact or COVID-19 transmission during the pandemic as the messages prompted many to wear face masks, protect their eyes, as well as general respiratory etiquette.

The finding also aligns with Seale's (2020) finding that media messages played an influencing role in determining the practices related to the pandemic, and that of Oberri et al's (2021) and Apuke and Omar's (2021) which indicated that the media had a significant influence on individuals' compliance with preventive measures against the COVID-19 virus. However, the current finding differs from some of Brown's (2021) findings which revealed that exposure to the messages made the people observe physical distancing and practice hand hygiene as that was not the case among the residents of Southeast, Nigeria.

The third objective of the study sought to identify the factors that affected Southeast residents' adherence to the COVID-19 PCMs and revealed that the major constraints include the difficulty in practicing physical distancing in public worship places and public transport ($\bar{x}$=1.57±0.72); and the need to work daily to provide food for the household ($\bar{x}$=1.27±0.69); while the minor constraints were alleged government officials' non-compliance with the PCMs($\bar{x}$=0.90±0.82); the discomfort that comes with the wearing of face mask ($\bar{x}$=0.85±0.76); lack of access to stable running water ($\bar{x}$=0.83±0.73); and lack of conviction in the existence of COVID-19 in Nigeria ($\bar{x}$=0.38±0.68). Likewise, this finding is in agreement with the study of Chen et al., (2020) that: factors such as lack of trust in the government, subjective norms and values as well as the belief system of the people prevented them from adhering strictly to the preventive measures suggested by the media (14).

In the same light, this finding aligns with the finding of Al-Hanawi et al., (2020)that social influence and lack of trust in the health professionals used in passing such messages were the factors that affected adherence to COVID-19 preventive measures among the Saudi Arabian population.These findings imply that health-related behavioural change in times of health emergence is not only dependent on people's exposure to desired health communication but should also include efforts aimed at eliminating constraint factors.

Standard Protocol on Approvals, Registrations, Patient Consents & Animal Protection

The ethical approval with reference number: UN/FA/FAREC/09092023 was obtained from The Faculty of Arts Research Ethics Committee of the University of Nigeria, Nsukka, Enugu State, Nigeria on February 10th, 2023. The confidentiality of the participants was preserved by following the Helsinki 2013 Declaration on Ethical Principles for Medical Research involving human subjects.

For instance, one of the researchers who monitored the collection of data was a health professional. Again, verbal permission was obtained from the selected communities' leaders before the commencement of the study in their domains. The researchers took time to explain to the prospective respondents, and only

those who volunteered to participate were sampled. To protect their anonymity, the respondents were not obliged to provide their names or any traceable identities and only the research team has access to the data.

Conclusion

This study has examined Southeast residents' exposure to COVID-19 PCMs, their level of adoption of the campaign messages, and the constraint factors. This study, therefore, found that the Southeast residents accessed information on face mask usage, high-contact surface disinfection, crowd-related rules, hand hygiene, physical distancing, and symptoms monitoring through the COVID-19 PCMs. Their exposure to the campaign messages which was positively and significantly related to their level of education occurred through social media, television, Family/Friends/Neighbours, and radio.

The study also reported a positive and significant relationship between the respondents' exposure to the COVID-19 PCMs and their adoption of the messages like the use of face masks, not touching the eyes and nostrils with their fingers, disinfecting high contact surfaces, no hugging and handshaking, encouraging family and neighbours to observe same preventive measures, and not relying on non-scientific measures.

The study also reported that constraints to their adoption of the PCMs were the difficulty in practicing physical distancing; the need to work daily to provide food for the household, alleged government officials' non-compliance with the PCMs; the discomfort that comes with the wearing of face mask; lack of access to stable running water; and lack of conviction in the existence of COVID-19 in Nigeria.

The study therefore concludes that despite the presence of some constraint factors, there was a significant level of exposure to and adoption of COVID-19 PCMs among the Southeast residents in Nigeria.

Recommendations

In line with the findings above, the following recommendations were advanced:

i. In future health emergencies in Southeast Nigeria, health communication experts should invest more in radio, TV, and social media and face-to-face communication in promoting the necessary health information and mobilizing the people to imbibe the desired health behaviour when they wish to reach a greater number of the populace in the area.

ii. State governments in Southeast Nigeria should provide an enabling environment for the adoption of desired health behaviour among Southeast residents. As in the case of COVID-19, the number of residents who would have adopted more PCMs would have been higher if they could access running water, or enough palliatives to enable them to stay at home without going out in search of food for their households during the lockdown.

iii. Government officials involved in health communication campaigns like COVID-19 prevention should live by example by practising ideal health behaviour at all times.

Practical Policy Implications of the Study

This study underscores the importance of strategic and effective health communication in influencing behaviour change and promoting preventive measures during a health crisis like the COVID-19 pandemic. The findings reveal that residents in Southeast Nigeria were exposed to COVID-19 prevention campaign messages, particularly regarding the use of face masks, disinfection of high-contact surfaces, and avoidance of crowded and poorly ventilated spaces; and their exposure has positive and significant relationship with their adoption of the messages.

Given that the communication efforts were successful in reaching the target audience, delivering key messages, and influencing behaviour change among the target population, individuals who were more exposed to the campaign messages were more likely to adopt preventive behaviours such as wearing face masks, avoiding touching their eyes and nostrils, refraining from hugging and handshakes, and promoting these behaviors among their family and neighbors.

The study equally highlights the significant role of education in shaping individuals' exposure to and adoption of COVID-19 prevention campaign messages. It indicates a positive relationship between education levels and exposure to campaign messages, suggesting that higher education levels contribute to greater awareness and understanding of preventive measures.

Given that the study identifies the difficulty in practicing physical distancing and the need to work daily to provide food for the household as constraint factors, these findings emphasize the importance of considering socio-economic factors and addressing practical challenges faced by individuals when designing and implementing health communication strategies.

The study therefore provides valuable lessons for future health communication efforts during health emergencies. It emphasizes the effectiveness of utilizing social media, television, and radio as communication channels to promote health-related issues. Furthermore, it suggests the need to eliminate constraint factors and tailor communication strategies to address the specific needs and challenges faced by the target population.

Limitations and Recommendations for Future Research

Despite the seminal contributions to knowledge by this study, the paper sample size, use of self-reported data, cross-sectional design, and limited scope individually and collectively limit the extent to which the findings can be generalized and applied.

The study utilized a sample size of 663 respondents from South-East states of Nigeria, which may not be fully representative of the entire population. Consequently, the findings may not be generalizable to other regions or demographic groups within the country. It is therefore recommended that future research should employ a larger and more diverse sample that could provide a more comprehensive understanding of the exposure and adoption of COVID-19 prevention campaign messages across different regions or demographic groups within the country or other countries. This can help in providing insights into the contextual factors influencing exposure and adoption of COVID-19 prevention campaign messages and also help in identifying specific challenges and effective communication strategies suitable for each context.

Given that the data was collected using self-reported responses from the participants, the data may be subject to recall or social desirability bias. This means, the participants might have provided socially desirable answers rather than reflecting the actual behaviours or experiences. Future research could therefore consider incorporating qualitative research methods like interviews, focus group discussions, or observational methods to validate self-reported data, uncover nuanced insights, and provide a more comprehensive understanding of the sociocultural factors that influenced behaviour change.

The study utilized a cross-sectional design, which captures data at a specific point in time. This does not allow for the assessment of changes or trends over time. Future research could benefit from a longitudinal study design that tracks individuals' exposure to and adoption of campaign messages over an extended period, which could provide more insights into the long-term effectiveness of communication strategies and how they influence behaviour change over time. Such a study can also capture the impact of different phases of a pandemic and changing public health guidelines or individuals' behaviours.

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Competing Interest

There is no competing interest to declare here

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