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Attitude of Women to 2024 Communication Intervention Message on Heat Waves by Nigeria Federal Ministry of Environment: A Case of South-East

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A B S T R A C T

This study explored the attitudes of women in Nigeria's South-East region towards the 2024 communication intervention messages on heat waves issued by the Nigeria Federal Ministry of Environment. The aim was to evaluate awareness, exposure, clarity, relevance, and the likelihood of following these messages, and to offer recommendations for improving their effectiveness. The study utilized a cross-sectional design with a quantitative approach to assess attitudes towards the communication intervention. The study focused on women in three states of Nigeria's South-East region—Anambra, Ebony, and Enugu. A total of 663 women were sampled, with 282 from Anambra, 152 from Ebony, and 229 from Enugu. Data were analyzed using descriptive statistics, cross-tabulations, and ANOVA to determine variations in awareness, clarity, relevance, and response to the heat wave messages. The findings showed among others, that awareness of and attitude to heat waves varied significantly among the states, with Anambra showing higher awareness compared to Ebony and Enugu. Based on the findings, it was recommended among others, that Ministry of Environment should revise communication strategies to ensure messages are clear, actionable, and region-specific

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INTRODUCTION

There have been reports of increased morbidity and mortality associated with frequent heat waves, which is the most obvious evidence of global warming and climate change experienced globally (Adah, Olusonde, & Nashon, 2019). Heat waves are one of the deadliest of natural hazards, and their frequency and intensity will likely increase as the climate continues to warm (Cecinati, Matthews, Natarajan, McCullen, & Coley, 2019). The frequency of heat waves has increased in recent years, consistent with anthropogenic climate change (IPCC, 2023).

On February 28, 2024, the Nigerian Federal Ministry of Environment issued a fresh advisory on how to manage heat waves, which was heavily reported by Nigerian media organizations. According to this advisory, as reported by Ileyemi (2024) in the Premium Times newspaper, exposure to heat waves can pose serious health, social, environmental, and economic risks. Infants, women, especially pregnant ones, and the elderly are more vulnerable to heat stress, with symptoms that include dry lips, excessive thirst, dizziness, nausea, heat rashes, mild fever, confusion, fainting, and a high body temperature. The message succinctly specifies that when possible, Nigerians should close their curtains during the hottest parts of the day and open windows at night to cool down the house; should not go outside during the hottest times of the day if they can avoid it; and when outside, wear sunscreen and try to stay in the shade or use hats and umbrellas for protection; drink water at regular intervals before they are thirsty; wear light and loose-fitting clothing; and reduce physical activity; and avoid participating in outdoor sports in the central hours of the day.

The communication intervention message from the Federal Ministry of Environment was targeted at encouraging Nigerians to plan their outdoor activities, avoid unnecessary exposure to heat waves, and keep an emergency kit at home that contained oral rehydration salt (ORS) packets, thermometer, towels or clothes to wet for cooling, and a handheld fan with batteries. The intervention further provided that, when possible, Nigerians should close their curtains during the hottest parts of the day and open windows at night to cool down the house; that Nigerians should not go outside during the hottest times of the day if they can avoid it; and that when outside, they should wear sunscreen and try to stay in the shade or use hats and umbrellas for protection. The intervention further specified that Nigerians should drink water at regular intervals before they are thirsty, wear light and loose-fitting clothing, reduce physical activity, and avoid participating in outdoor sports in the central hours of the day, amongst several other related activities.

Unusually hot weather events lasting several days are often referred to as heat waves. Currently, they are one of the most dangerous environmental threats and can have enormous effects on all aspects of life, including individual and public health, food security, and the economy (WHO, 2021). The observed effects of global warming, with climate change being the main driver, are also affecting extreme heat events, which are increasing in frequency, magnitude, duration, and measured temperatures, and most land regions will certainly be affected in the future (Perkins & LV A. 2012, IPCC, 2021).As the effects of heat waves

are disproportionately felt by developing countries like Nigeria, extreme heat tends to pose serious health risks to Nigerians, including heat-related illnesses such as heat exhaustion, heatstroke, dehydration, and cardiovascular complications. As average temperatures rise, scientists expect heat waves to become more frequent and intense (USGCRP, 2017), especially when people are unaware of the precautionary measures to manage the heat wave condition.

This intervention message has become critical because soaring temperatures, exacerbated by climate change and global warming, pose significant risks to human health and well-being and can result in various kinds of infectious diseases such as rashes, cramps, heat exhaustion, respiratory issues, and other severe conditions such as heat stroke, which can be accompanied by delirium, convulsions, coma, and even death (Physicians for Social Responsibility, 2024). Anecdotal evidence has shown that extreme heat events can trigger a variety of heat stress conditions, such as heat stroke, which occurs when the body becomes unable to control its temperature. This condition can cause death or permanent disability if emergency treatment is not given. Small children, the elderly, especially women, and certain other groups, including people with chronic diseases, low-income populations, and outdoor workers, can be considered to be at higher risks for heat-related illness. Higher temperatures and respiratory problems can also be linked to heat waves, given that higher temperatures contribute to the buildup of harmful air pollutants. As heat waves have been shown to increase violent behavior, suicide, and homicide, long-lasting bouts of heat exacerbate stress and symptoms of mental illness (Physicians for Social Responsibility, 2024). These events result in increased hospital admissions for heat-related illnesses as well as cardiovascular and respiratory disorders. These suggest that increasing average temperatures and heat waves can have devastating impacts on human health and well-being, but studies of heat impacts and how people adapt are rare and often confined to specific locations (Zander, Rieskamp, Mirbabaie, Alazab, & Nguyen, 2023).

Women and girls are particularly vulnerable to the effect of heat wave. Apart from killing people, women who are distressed and have several health challenges, such as chronic illnesses, may be severely affected by heat waves, which can reduce their productivity, disrupt their comfort, and increase violence against women and girls. The effect of heat wave episodes can be argued to be more predominantly felt by women and girls, as well as by the most vulnerable population subgroups, such as the elderly. This is why the study is specifically focused on women in southeast Nigeria. The need to ascertain their attitude therefore is imperative.

Attitude is an effective response to an object, cause or event which can be favourable or unfavourable and positive or negative. Attitude can influence action either positively or negatively. Thus, women's attitude to the communication message may influence what they do with the message. Several studies related to the present have not established the attitude of women to heat waves. Moisoglou et al (2024) studied the predictors of knowledge, attitudes, and practice regarding heat waves in Greece in September 2023and found a positive relationship between self-perceived health status and awareness, practice, and

behaviour concerning heat waves. Similarly, they identified a positive relationship between self-perceived financial status and awareness and behaviour concerning heat waves. Increased age was associated with an increased practice score, while increased educational level was associated with an increased knowledge score. Additionally, they found that the behaviour score was higher among participants in urban areas than those in rural areas and that several socio-demographic variables affect participants' knowledge, awareness, practice, and behaviour concerning heat waves. Similarly, Adah, Olusonde, and Nashon (2019) determined health workers' perceptions of the cause of the heat wave, its effect on health, and protective measures taken in Yola, Adamawa State, during the April 2019 heat wave. The results indicated that the majority (68.8%) of health workers perceived that the increased environmental heat was associated with severe discomfort. A large proportion (72.5%) of health workers had the cause to educate individuals on heat management, but only a few (25%) had good knowledge on heat-related morbidity, and 13.8% were aware of any existing guidelines on the management of heat waves. Ignorance and misconceptions exist surrounding the cause and effects of the heat waves in the context of changing climates, with the vast majority (90%) perceiving themselves as having no role to play in climate change. Trees and shades (29.2%) were the most frequently used methods for protecting oneself from heat at home, while few practiced increased fluid intakes (7.1%).

LITERATURE REVIEW

The increasing frequency and intensity of heat waves due to climate change pose significant health risks and environmental challenges globally, and Nigeria is no exception. In response, the Nigeria Federal Ministry of Environment has launched various communication interventions aimed at raising awareness and promoting adaptive behaviours to mitigate the adverse effects of heat waves. However, the effectiveness of these interventions largely depends on the public's attitude towards the communicated messages, particularly among vulnerable groups such as women.

In the South-East region of Nigeria, women play a crucial role in managing household and community health, making their attitude towards environmental health messages critically important. Despite this, there is a paucity of research focusing on how women in this region perceive, understand, and respond to communication interventions related to heat waves. This gap in knowledge hinders the development of tailored and effective communication strategies that can enhance the resilience of communities to heat-related impacts. The core problem, therefore, is to understand the attitude of women in South-East Nigeria towards the 2024 communication intervention messages on heat waves disseminated by the Nigeria Federal Ministry of Environment.

The main purpose of the study was to determine the attitude of women in South East Nigeria towards the 2024 communication intervention messages on heat waves disseminated by the Nigeria Federal Ministry of Environment. Specifically, the study determined:

1. The attitude of women in South-East to 2024 communication intervention message on heat waves by Nigerian Federal Ministry of Environment;

2. Differences in attitude of women across States in South-East to 2024 communication intervention message on heat waves by Nigerian Federal Ministry of Environment.

The following research questions were answered in the study:

1. What is the attitude of women in South-East to 2024 communication intervention message on heat waves by Nigerian Federal Ministry of Environment?
2. Are there differences in the attitude of women across States in South-East to 2024 communication intervention message on heat waves by Nigerian Federal Ministry of Environment?

METHODOLOGY

This study adopted a quantitative design involving the survey research design. The study population is all Nigerian women in the South-East, comprised of a total of 12,414,443 persons, a projection from the 8,210604 population as at the 2006 Nigerian population census. The population is distributed as follows:

Table 1. Distribution of Population

South-Eastern States	Population of women from the 2006 Census as obtained from the Office of the Nigerian Population Census, Awka, Anambra State.	Projected Population of the Women as at 2022
Abia	1,415082	724522 + 1,415082 = 2,139,604
Anambra	2,059844	1,054,640 + 2,059844 = 3,114,494
Ebonyi	1,112791	569,749+ 1,112,791 = 1,682,540
Enugu	1,671795	855,959 + 1,671,795 =2,527,754
Imo	1,951092	998,959 + 1,951,092 =2,950,051
Total	**8,210604**	**12, 414, 443 (Projected)**

Source Field Survey, 2024

A sample of 663 respondents was selected using a multi-stage probability sampling technique, which involved a series of random sampling processes at various levels of the population. South-East has five states comprised of Anambra, Imo, Ebonyi, Abia, and Enugu, among which three were first randomly selected. Sample is as shown in the table below:

Table 2. Distribution of Sample

Senatorial Zones	Local government Areas	Communities	No of Respondents	Type of community	Total
Enugu West	Oji River	Ugwuoba	76	Urban	229
Enugu East	Nkanu East	Amagunze	77	Rural	
Enugu North	Uzo-Uwani	Ugbenu	76	Urban	
Anambra Central	Awka South	Amawbia	94	Urban	282
Anambra North	Onitsha North	Onitsha	94	Urban	
Anambra South	Ekwusigo	Oraifite	94	Rural	
Ebonyi Central	Ezza North	Ndufu	51	Urban	152
Ebonyi North	Abakaliki	Abakaliki	51	Urban	
Ebonyi South	Ohaozara	Mgbom	50	Rural	
		Total	**663**		**663**

Source Field Survey, 2024

A close ended questionnaire was developed and validated for the study. Quantitative data emanating from 'survey' were analysed using some descriptive statistics encompassing the frequency distribution, percentages, and cross-tabulations. Hypothesis was tested with Analysis of Variance (ANOVA)

RESULT

Table 3. Respondents' Awareness of Heat Waves

			Have you heard about heat waves?		
			YES	NO	Total
Responents	Anambra	Count	161	121	282
		% within Responents	57.1%	42.9%	100.0%
	Ebonyi	Count	0	152	152
		% within Responents	0.0%	100.0%	100.0%
	Enugu	Count	106	123	229
		% within Responents	33.3%	66.7%	100.0%
Total		Count	267	396	663
		% of Total	30.0%	70.0%	100.0%

Source Field Survey, 2024

The crosstabulation of responses to the question "Have you heard about heat waves?" reveals distinct patterns in awareness among women from three regions: Anambra, Ebonyi, and Enugu. Awareness is highest in Anambra with more than half of the respondents aware of heat waves. Ebonyi women show the lowest awareness, with no respondents aware of heat waves. Enugu has moderate awareness, with one-third of respondents aware of heat waves. Overall, awareness of heat waves is limited, with a significant majority of respondents across all regions unaware of the issue

Table 4. Source of Information About Heat Waves

			How did you first learn about heat waves?			
			TV	Community Meeting	Friends/ Family	Total
Responents	Anambra	Count	81	201	0	282
		% within Responents	28.6%	71.4%	0.0%	100.0%
	Ebonyi	Count	0	87	65	152
		% within Responents	0.0%	57.1%	42.9%	100.0%
	Enugu	Count	0	0	229	229
		% within Responents	0.0%	0.0%	100.0%	100.0%
Total		Count	81	288	294	663
		% of Total	10.0%	45.0%	45.0%	100.0%

Source Field Survey, 2024

The data from Table 4 indicates how respondents from Anambra, Ebonyi, and Enugu first learned about heat waves, with three primary sources: TV, community meetings, and friends/family. Community meetings are the most common source of information about heat waves, particularly in Anambra and Ebonyi. Friends and family are the primary source in Enugu, with no respondents from Anambra or Ebonyi reporting this source. TV is a source of information only in Anambra, with no respondents from Ebonyi or Enugu reporting it as their first source. Overall, community meetings and friends/family are equally significant sources, each accounting for 45% of the total responses, while TV accounts for a smaller proportion (10%)

Table 5. Awareness of any Messages from the Nigeria Federal Ministry of Environment About Heat Waves in 2024?

			Have you seen or heard any messages from the Nigeria Federal Ministry of Environment about heat waves in 2024?		
			YES	NO	Total
Responents	Anambra	Count	282	0	282
		% within Responents	100.0%	0.0%	100.0%
	Ebonyi	Count	87	65	152
		% within Responents	57.1%	42.9%	100.0%
	Enugu	Count	153	76	229
		% within Responents	66.7%	33.3%	100.0%
Total		Count	522	141	663
		% of Total	75.0%	25.0%	100.0%

Source Field Survey, 2024

The data from Table 5 indicates the awareness of respondents from Anambra, Ebonyi, and Enugu regarding messages from the Nigeria Federal

Ministry of Environment about heat waves in 2024.Anambra women show the highest awareness, with all respondents having seen or heard messages from the Nigeria Federal Ministry of Environment about heat waves. Ebonyiwomen have the lowest awareness, with a significant portion (42.9%) of respondents not having seen or heard the messages. Enugu has moderate awareness, with two-thirds of respondents aware of the messages. Overall, the majority of respondents (75%) across all regions are aware of the messages about heat waves, indicating a broad reach of the Ministry's communication efforts. However, targeted strategies may be needed to improve awareness in Ebonyi.

Table 6. Frequently of Encounter with These Messages

		How Frequently do You Encounter These Messages?					
		Daily	Monthly	Weekly	Rarely	Never	Total
Anambra	Count	0	0	0	81	201	282
	% within Responents	0.0%	0.0%	0.0%	28.6%	71.4%	100.0%
Ebonyi	Count	22	0	22	108	0	152
	% within Responents	14.3%	0.0%	14.3%	71.4%	0.0%	100.0%
Enugu	Count	38	76	115	0	0	229
	% within Responents	16.7%	33.3%	50.0%	0.0%	0.0%	100.0%
Total	Count	60	76	137	189	201	663
	% within Responents	10.0%	10.0%	20.0%	35.0%	25.0%	100.0%

Source Field Survey, 2024

The data from Table 6 provides insights into how frequently respondents from Anambra, Ebonyi, and Enugu encounter messages from the Nigeria Federal Ministry of Environment about heat waves. Anambra respondents predominantly encounter the messages with an unspecified frequency (71.4%), with no reports of daily, monthly, or rare encounters. Ebonyi respondents mainly do not encounter the messages (71.4%), with some encountering them daily or rarely. Enugu respondents have a more balanced distribution, with daily (16.7%), monthly (33.3%), and rare (50%) encounters, but no reports of never encountering the messages. Overall, 35% of respondents never encounter these messages, highlighting a significant gap in message dissemination. Only a small proportion (10%) encounter the messages regularly (daily or monthly).

Table 7. Clarity and Understandability of Heat Wave Messages Provided by the Ministry

		How Clear and Understandable are the Heat Wave Messages Provided by the Ministry?				
		Very Clear	Clear	Unclear	Very Unclear	Total
Anambra	Count	161	121	0	0	282
	% within Responents	57.1%	42.9%	0.0%	0.0%	100.0%
Ebonyi	Count	0	0	130	22	152
	% within Responents	0.0%	0.0%	85.7%	14.3%	100.0%
Enugu	Count	0	0	38	191	229
	% within Responents	0.0%	0.0%	16.7%	83.3%	100.0%
Total	Count	161	121	168	213	663
	% within Responents	20.0%	15.0%	35.0%	30.0%	100.0%

Source Field Survey, 2024

The data from Table 7 shows respondents' perceptions of the clarity and understandability of heat wave messages from the Nigeria Federal Ministry of Environment across Anambra, Ebonyi, and Enugu. Anambra respondents predominantly find the messages clear or very clear, indicating high levels of comprehension and satisfaction with the Ministry's communication efforts. Ebonyi and Enugu respondents face significant challenges with message clarity: Ebonyi has a majority finding the messages unclear (85.7%) and some finding them very unclear (14.3%). Enugu shows the highest dissatisfaction, with the majority finding the messages very unclear (83.3%).Overall, there is a notable divide in message clarity perceptions, with Anambra respondents finding them clear, while respondents from Ebonyi and Enugu report substantial difficulties in understanding the messages, highlighting a need for improved communication strategies in these region.

Table 8. Relevance of Messages to Daily Life

			How relevant do you find these messages to your daily life?			
			Very Relevant	Relevant	Irrelevant	Total
Responents	Anambra	Count	201	81	0	282
		% within Responents	71.4%	28.6%	0.0%	100.0%
	Ebonyi	Count	0	87	65	152
		% within Responents	0.0%	57.1%	42.9%	100.0%
	Enugu	Count	0	0	229	229
		% within Responents	0.0%	0.0%	100.0%	100.0%
Total		Count	201	168	294	663
		% within Responents	25.0%	30.0%	45.0%	100.0%

Source Field Survey, 2024

The data from Table 6 indicates how relevant respondents from Anambra, Ebonyi, and Enugu find the heat wave messages from the Nigeria Federal Ministry of Environment to their daily lives. Anambra respondents predominantly find the messages relevant, with the majority (71.4%) finding them very relevant and the remainder (28.6%) finding them relevant. Ebonyi respondents have a mixed perception, with a majority (57.1%) finding the messages relevant, but a significant portion (42.9%) finding them irrelevant. Enugu respondents uniformly find the messages irrelevant, highlighting a significant disconnect between the message content and the daily life relevance in this region. Overall, while a portion of respondents (55%) find the messages relevant to some extent (either very relevant or relevant), a significant proportion (45%) find them irrelevant, indicating a need for more targeted and contextually appropriate messaging, especially in Enugu and parts of Ebonyi.

Table 9. Belief in Seriousness of Threat of Heat Waves to Health and Well-Being

			Do you believe that heat waves are a serious threat to your health and well-being?			
			Agree	Disagree	Strongly Disagree	Total
	Anambra	Count	201	81	0	282
		% within Responents	71.4%	28.6%	0.0%	100.0%
	Ebonyi	Count	0	87	65	152
		% within Responents	0.0%	57.1%	42.9%	100.0%
	Enugu	Count	0	76	153	229
		% within Responents	0.0%	33.3%	66.7%	100.0%
Total		Count	201	244	7	663
		% within Responents	25.0%	40.0%	35.0%	100.0%

Source Field Survey, 2024

The data from Table 9 illustrates respondents' beliefs about the seriousness of heat waves as a threat to their health and well-being across Anambra, Ebonyi, and Enugu. Anambra respondents largely perceive heat waves as a serious threat to their health and well-being, with a significant majority (71.4%) agreeing with the statement. Ebonyi and Enugu respondents show significant skepticism: Ebonyihas a majority who disagree (57.1%) or strongly disagree (42.9%) with the statement. Enugu has an even higher level of disagreement, with the majority strongly disagreeing (66.7%) and the remainder disagreeing (33.3%). Overall, the belief in the seriousness of heat waves as a health threat is notably higher in Anambra compared to Ebonyi and Enugu, indicating regional differences in perception that may need to be addressed through tailored communication and education strategies

Table 10. Feeling of Adequacy of Information on Protection of Self and Family During a Heat Wave

		Do you feel adequately informed on how to protect yourself and your family during a heat wave?			
		Strongly Agree	Disagree	Strongly Disagree	Total
Anambra	Count	0	0	282	282
	% within Responents	0.0%	0.0%	100.0%	100.0%
Ebonyi	Count	22	65	65	152
	% within Responents	14.3%	42.9%	42.9%	100.0%
Enugu	Count	76	153	0	229
	% within Responents	33.3%	66.7%	0.0%	100.0%
Total	Count	98	218	347	663
	% within Responents	15.0%	35.0%	50.0%	100.0%

Source Field Survey, 2024

The data from Table 10 indicates respondents' feelings about the adequacy of information they have received on how to protect themselves and their families during a heat wave across Anambra, Ebonyi, and Enugu. Anambra respondents uniformly feel inadequately informed, with all respondents (100%) strongly disagreeing that they have sufficient information to protect themselves and their families during a heat wave. Ebonyi respondents display a varied perception, with a minority strongly agreeing (14.3%), while the majority are split between disagreeing (42.9%) and strongly disagreeing (42.9%). Enugu respondents are the most confident in their information adequacy, with a significant portion (33.3%) strongly agreeing and the remaining (66.7%) disagreeing, indicating no respondents strongly disagreeing. Overall, there is a clear need for improved and more effective communication of protective measures during heat waves, particularly in Anambra, where respondents feel the least informed.

Table 11. Likelihood of Following Recommendations Provided in the Ministry's Heat Wave Messages

			How likely are you to follow the recommendations provided in the Ministry's heat wave messages?		
			Very Likely	Likely	Total
Responents	Anambra	Count	282	0	282
		% within Responents	100.0%	0.0%	100.0%
	Ebonyi	Count	130	22	152
		% within Responents	85.7%	14.3%	100.0%
	Enugu	Count	38	191	229
		% within Responents	16.7%	83.3%	100.0%
Total		Count	450	213	663
		% within Responents	70.0%	30.0%	100.0%

Source Field Survey, 2024

The data from Table 11 assesses respondents' likelihood of following the recommendations provided in the Nigeria Federal Ministry of Environment's heat wave messages across Anambra, Ebonyi, and Enugu. Anambra respondents show complete confidence in the Ministry's heat wave recommendations, with all respondents indicating they are very likely to follow them. Ebonyi respondents are also highly likely to follow the recommendations, with a significant majority (85.7%) being very likely and a small portion (14.3%) being likely to follow them. Enugu respondents display a more moderate stance, with the majority (83.3%) being likely and a smaller portion (16.7%) being very likely to follow the recommendations. Overall, there is a strong inclination among the respondents to adhere to the Ministry's recommendations, especially in Anambra and Ebonyi, suggesting effective communication and trust in the Ministry's guidance in these regions.

Table 12. ANOVA Test of Differences in Women's Responses

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Have you heard about heat waves?	Between Groups	1.152	2	.576	3.214	.065
	Within Groups	3.048	17	.179		
	Total	4.200	19			
How did you first learn about heat waves?	Between Groups	16.379	2	8.189	5.666	.013
	Within Groups	24.571	17	1.445		
	Total	40.950	19			
Have you seen or heard any messages from the Nigeria Federal Ministry of Environment about heat waves in 2024?	Between Groups	.702	2	.351	1.959	.172
	Within Groups	3.048	17	.179		
	Total	3.750	19			
How frequently do you encounter these messages?	Between Groups	21.260	2	10.630	8.331	.003
	Within Groups	21.690	17	1.276		
	Total	42.950	19			
How clear and understandable are the heat wave messages provided by the Ministry?	Between Groups	20.345	2	10.173	50.792	.000
	Within Groups	3.405	17	.200		
	Total	23.750	19			
How relevant do you find these messages to your daily life?	Between Groups	10.057	2	5.029	27.200	.000
	Within Groups	3.143	17	.185		
	Total	13.200	19			
Do you believe that heat waves	Between Groups	7.324	2	3.662	13.907	.000
	Within Groups	4.476	17	.263		

are a serious threat to your health and well-being?	Total	11.800	19			
Do you feel adequately informed on how to protect yourself and your family during a heat wave?	Between Groups	9.010	2	4.505	6.282	.009
	Within Groups	12.190	17	.717		
	Total	21.200	19			
How likely are you to follow the recommendations provided in the Ministry's heat wave messages?	Between Groups	2.510	2	1.255	12.618	.000
	Within Groups	1.690	17	.099		
	Total	4.200	19			

Source Field Survey, 2024

The analysis of variance (ANOVA) tests the differences in responses across various groups for different questions related to heat waves and the communication from the Nigeria Federal Ministry of Environment. There are significant differences between groups for most questions, indicating that responses vary significantly across the different regions or demographics analyzed. For the questions "Have you heard about heat waves?" and "Have you seen or heard any messages from the Nigeria Federal Ministry of Environment about heat waves in 2024?", no significant differences were found between groups, suggesting a more uniform awareness or exposure to these aspects. Questions about the clarity, relevance, and likelihood of following recommendations showed highly significant differences, highlighting varied perceptions and potential impacts of the Ministry's messages in different groups.

DISCUSSION

The study investigated attitude of women to heat wave messages from the Nigeria Federal Ministry of Environment, focusing on three southeastern states: Anambra, Ebonyi, and Enugu. Awareness levels varied significantly across the states, with Ebonyi showing a particularly low awareness rate. This aligns with research indicating that awareness of climate-related issues can vary widely depending on regional outreach efforts and local media coverage (Adah et al, 2019). The disparity in awareness might be influenced by the effectiveness and reach of local information dissemination channels. Previous studies have found that awareness of climate risks like heat waves is often influenced by media exposure and public education campaigns (Cecinati et al, 2019). Regional differences in these factors can explain the observed variance in awareness levels.

The predominant sources of information reflect local information dissemination practices. Community meetings in Anambra suggest an active community engagement approach, while reliance on friends and family in

Ebonyi and Enugu points to informal information networks. This is consistent with findings that community-based communication can be effective in spreading environmental awareness (Zander et al., 2023). Research has shown that community-based and interpersonal communication methods can significantly influence public awareness and behavior regarding environmental issues (Ileyemi, 2024).

High exposure rates in Anambra compared to other states suggest effective message dissemination in this region. The varying exposure rates could be due to differences in media outreach, public campaigns, or community engagement strategies used by the Ministry (Moisoglou et al., 2024). Effective communication strategies are crucial for raising awareness about climate risks (Moisoglouet al., 2013). Variability in exposure can impact the overall effectiveness of these strategies. The low frequency of message encounter, especially in Anambra and Ebonyi, suggests that while messages are reaching some people, they might not be reaching the wider population consistently. This is a concern as frequent exposure is essential for effective message retention and behavioral change (Ileyemi, 2024). Studies highlight the importance of consistent and frequent communication in ensuring that public health messages are effective (Ileyemi, 2024).

Furthermore, perceived clarity varies significantly, with many respondents in Ebonyi and Enugu finding the messages unclear. This indicates potential issues with message design or delivery, which could affect comprehension and impact (Zander et al, 2016). Effective communication must ensure that messages are clear and understandable to all target audiences (Kline, 2018). Poor clarity can undermine the effectiveness of communication efforts. In addition, the perceived relevance of messages was high in Anambra but low in Enugu. This discrepancy highlights the importance of tailoring messages to local contexts and needs to enhance their relevance (Ileyemi, 2024). Research shows that tailoring messages to local conditions and personal relevance can significantly improve their impact (Ileyemi, 2024).

Belief in the seriousness of heat waves varies, which can affect the perceived importance of following recommendations. Lower belief in the threat in Enugu might contribute to lower engagement with the messages. Perceptions of threat are closely linked to engagement with risk mitigation behaviors (Perkins, 2012).

The perceived inadequacy of information in Anambra and mixed responses in Ebonyi suggest gaps in providing actionable guidance. This reflects challenges in communicating complex information effectively (Ileyemi, 2024). Effective communication of protective measures is crucial for public health preparedness. The high likelihood of following recommendations in Anambra and Ebonyi suggests a positive reception to the Ministry's messages. However, the lower likelihood in Enugu could be related to perceived irrelevance or clarity issues. The likelihood of following health recommendations is influenced by message credibility, relevance, and clarity (Ajzen, 1991). Overall, the study highlights significant regional differences in awareness, perception, and response to heat wave messages. These differences underscore the need for tailored communication strategies that address local contexts, enhance message clarity,

and ensure frequent exposure to effectively manage and mitigate the impacts of heat waves.

CONCLUSIONS AND RECOMMENDATIONS

The findings from the study provide a nuanced understanding of how heat wave messages from the Nigeria Federal Ministry of Environment are perceived and acted upon across three southeastern states—Anambra, Ebonyi, and Enugu. Awareness of heat waves is uneven, with Anambra showing relatively higher awareness compared to Ebonyi and Enugu. Despite some progress, overall awareness remains limited. Moreover, exposure to Ministry messages also varies, with Anambra exhibiting higher exposure rates than other regions. This suggests that while some areas have robust information dissemination channels, others may require more effective outreach. Clarity and understandability of the messages are significant issues. While respondents in Anambra generally found the messages clear, many in Ebonyi and Enugu did not, indicating potential shortcomings in message design or delivery. Also, the perceived relevance of messages is also inconsistent. High relevance in Anambra contrasts with the low relevance reported in Enugu, pointing to the need for region-specific content that aligns with local conditions and concerns.

There is a mixed perception of the seriousness of heat waves. While many in Anambra and Ebonyi view heat waves as a serious threat, a substantial number in Enugu do not. This disparity affects how seriously the messages are taken and the likelihood of adhering to recommendations. The likelihood of following recommendations varies, with high adherence in Anambra and Ebonyi but less certainty in Enugu. This suggests that improving message clarity, relevance, and perceived threat could enhance compliance. Feelings about the adequacy of information on protective measures are varied. In Anambra, there is a notable gap in perceived adequacy, while respondents in Enugu feel better informed. This indicates a need for more comprehensive and actionable guidance across all regions. The effectiveness of the messages in informing and changing behavior is evident in the higher likelihood of following recommendations in certain areas. However, to maximize impact, improving clarity, relevance, and frequency of messages is crucial.By addressing these areas, the Nigeria Federal Ministry of Environment can enhance the effectiveness of its heat wave messaging, improve public awareness and preparedness, and ultimately better protect the health and well-being of communities across the southeastern states.
Based on the findings, the following are recommended:

1. The Ministry should review and revise the content of heat wave messages to ensure they are clear, actionable, and relevant to local contexts. It should tailor messages to address specific regional concerns and conditions.
2. Ministry should develop strategies to increase the frequency of message exposure, especially in regions with lower engagement. It should utilize diverse communication channels to reach a broader audience.
3. Ministry should strengthen efforts to communicate the seriousness of heat waves and provide comprehensive information on protective measures and ensure that messages are perceived as urgent and important.

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