Taylor & Francis
Taylor & Francis Group

RESEARCH ARTICLE

🔓 OPEN ACCESS | Check for updates
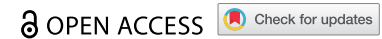
Rethinking the frontiers of vaccine acceptance: Impact of visual messages in promoting the actual intake of COVID-19 vaccines among vulnerable populations

Ngozi Agujiobi-Odoh[a], Itiav Vershima Joseph[a], Chinweobo-Onuoha Blessing[b], Chidi Amaechi[c], Obinna Muoh[c], Peter Nwokolo[b], and Gever Verlumun Celestine 🔟 [b]

[a]Department of Fine and Applied Arts, University of Nigeria, Nsukka, Nigeria; [b]Department of Mass Communication, University of Nigeria, Nsukka, Nigeria; [c]Department of History and International Studies, University of Nigeria, Nsukka, Nigeria

ABSTRACT

Studies on COVID-19 vaccine mainly focused on behavior intention and rarely on actual intake. This study attempted to fill this gap by assessing the impact of visual artistic messages on COVID-19 vaccination among victims of insecurity. The study was a quasi-experiment involving 362 victims of insecurity. There were two groups in the quasi experiment known as control and treatment groups. The former did not receive the intervention while the latter did. The results of the study revealed that vaccination among the participants in the visual intervention improved from 12% before the visual intervention to 74% after the intervention and 95% after 6 months of follow-up assessment. On the contrary, COVID-19 vaccination for the no visual intervention only slightly improved from 13% to 18% and 19%, respectively, within the same time framework. The study expands the argument on security discourse by highlighting the need to consider the health welfare of victims of armed conflict as part of the larger security discourse. Doing so will not only improves existing literature but also provides the needed empirical data that will guide policies and program on security issues. Theoretically, the study has offered fresh understanding regarding variables from the health belief model, such as perceived severity and perceived vulnerability.

Introduction

Vulnerable populations can be defined as people who lack access to health and other social amenities that will make them less vulnerable to diseases and infections. They are individuals who have a higher propensity to contract diseases because of their low socio-economic status or peculiar conditions. A team of researchers[1] affirm that vulnerable populations are normally disadvantaged when it comes to health care and this makes it important to suggest ways of delivering health-care services to them. Examples of vulnerable populations include the elderly, the homeless, victims of disasters such as conflict and natural disasters, the unemployed, the unemployed, among others.[2] Victims of conflict, as part of vulnerable populations are disadvantaged when it comes to access and utilization of health-care services. A team of researchers say that access to health-care information is one of the important needs of victims of conflict.[3]

Over the years, discourse on security issues, especially from the perspective of less developed countries, has paid less attention to health promotion vis-à-vis victims of insecurity. Rather, greater attention is paid to causes of insecurity, solutions to security challenges as well as impact of conflict on victims. Researchers[4–10] have examined these areas significantly and provided rich and robust findings. While these areas are important in widening our understanding of security challenges and suggesting ways of making society a better

place, it is essential to understand ways of assisting armed victims of conflict and insecurity in developing and sustaining useful health behavior in times of emergencies like COVID-19.

Victims of conflict are generally vulnerable and psychologically imbalanced. This is particularly so for those who have been displaced from their places of residence. In most cases, victims of conflict are suffering from losses that make them sad and uncomfortable. A researcher[11] affirms that the psychological impact of conflict on victims is huge, and this cuts across all victims, irrespective of age, gender, location, or career. A team of researchers[12] corroborate that conflict leads to mental instability and also results in a distortion in reasoning. Suffice it to say that conflict results in imbalance and instability in the psyche of the victims, then it follows logically that during outbreaks, such as the case with COVID-19, victims of violent conflict need to be assisted so that they can develop and sustain health behavior that will assist them in taking decisions that will not worsen their already precarious situation.

Victims of conflict require help during COVID-19 because they can be regarded as high-risk individuals. This is because so for those of them who are in internally displaced persons camps where life-saving health behavior practices are difficult to implement. For example, it is very difficult for internally displaced persons (IDPs) to observe physical distancing because of the lack of space and the overcrowding that takes place in internally displaced persons camps. A researcher[13] affirms that in most IDP camps, there is overpopulation and

an obvious lack of social amenities. IDP camps also lack running water to enable victims of insecurity to practice regular hand washing while also maintaining personal hygiene. The implication is that it is very easy for the COVID-19 virus to spread among this vulnerable population. The implication also is that isolation will be difficult at IDP camps. This, thus, makes prevention the most practicable health intervention approach for victims of conflict.

Clearly, COVID-19 is a severe public health emergency, and everyone is at risk of contracting it. According to the World Health Organization,[14] as of October 7, 2022, the world has recorded 617,597,680 cases of COVID-19 while 6,532,705 people have died of the virus. Because of the severity of the virus, WHO has approved a number of vaccines to reduce vulnerability to the virus. Examples of the approved vaccines include The Pfizer/BioNTech Comirnaty vaccine, the SII/COVISHIELD and AstraZeneca/AZD1222 vaccines, the Janssen/Ad26.COV 2. S vaccine developed by Johnson & Johnson, the Moderna COVID-19 vaccine (mRNA 1273), among others.[15] Although vaccines have been acknowledged as essential for making people less vulnerable to COVID-19, people will need to be convinced about the severity of the virus and the benefits of vaccination.

Visual illustration is the utilization of visual elements for the purposes of communicating meaning. Examples of visuals that can be used to communicate meaning include screenshots, videos, animated GIFs(Graphics Interchange Format), slide deck presentations and infographocs. A study[16] was carried out to examine the effect of visual messages in memory enhancement among undergraduates in Thailand. The researchers used online training sessions involving 19 undergraduates and found that visual communication effectively enhanced memory and learning among the sample examined. Although the study did not link visual communication with health promotion, the study offers an important perspective regarding the important role that visuals play in influencing people's thinking. A researcher[17] assessed the effect of pictures on health promotion. The researchers found that information presented through pictures increases understanding of diseases' severity more than information presented in other formats. The limitation of Chang's study is that it did not examine victims of insecurity vis-à-vis public health emergencies.

Vaccine intake is one of the most suitable ways of preventing people from contracting COVID-19. To be prevented from contracting the virus, victims of insecurity need to take the required number of doses for COVID-19.

Vaccine acceptance is one of the surest ways of overcoming the problem of resistance to vaccination. A team of researchers[18] say although vaccines remain a dependable way of addressing the challenges posed by COVID-19, this can only be achieved if the problem of vaccine refusal is addressed. A team of researchers[19] say promoting COVID-19 vaccine acceptance remains a herculean challenge, but it is also a viable strategy of ensuring that the virus is defeated. A team of researchers[20] in a study reported a COVID-19 acceptance rate of 65% in Nigeria compared to 81.6% in South Africa.

Despite this, limited studies have been conducted regarding how to craft messages that will encourage victims of conflict to take COVID-19. This study will expand the boundaries of security by highlighting the need to assist victims of conflict in adopting and sustaining helpful security behavior in times of global pandemics.

Objectives of the study

The goal of this study is to measure the effect of visual messages as interventions for assisting victims of conflict in Nigeria to take COVID-19 vaccine. Victims of conflict as used in this study are those who have been affected by the armed conflict that results in their displacement from their places of residence.

Outlook on Nigeria's security challenges

Nigeria is facing multiple security challenges that have had a severe negative impact on the populace. Nearly every part of the country has its peculiar security challenges. For example, in northern Nigeria, there is terrorism championed by Boko Haram insurgency, Islamic State of West Africa province, banditry, ethno-religious conflict as well as the conflict between farmers and herders. These security challenges have had a significant negative impact on the welfare and daily activities of people from the region.

For example, Boko Haram, though substantially degraded, according to Institute for Peace and Economics[21] still poses a serious security threat to the people of northern Nigeria. Boko Haram sect has been terrorizing Nigeria for some time, leading to the death of 350,000 persons.[22] Activities of the group have also led to the displacement of many more 2.9 million people.[23] Addressing the welfare of these victims of conflict remains a major concern in security discourse. Closely related to Boko Haram is Islamic State of West Africa Province (ISWAP). The group is regarded as a breakaway of Boko Haram and is also responsible for the death of Boko Haram's late leader Abubakar Shakau. However, details of its attacks are still sketchy, but ISWAP is still a serious security threat to Nigeria.

Another serious security threat confronting Nigeria is that of banditry. As a result of the severity of the bandit's activities, the Federal Government of Nigeria designated them as terrorists. The Institute for Peace and Economics[21] attributed the growing banditry in Northern Nigeria to poor governance and public dissatisfaction with government's handling of public finance, as well as corruption. Institute for Peace and Economics adds that there are as many as 30,000 bandits in Nigeria with 100 gangs. Bandits have caused the death of 3,125 people in 2021 alone.[24] According to a team of researchers,[25] banditry has led to disruptions in the daily activities of people with a corresponding negative impact on their income, psyche and behavior of people in the affected areas.

Another disturbing security concern is the conflict between farmers and herders. For many years, farmers and herders have been clashing over disagreements linked to grazing and cattle rustling. Amnesty International[26] says that attacks by Fulani herders have resulted in the deaths of about 4000 people

in different states of the federation like Benue, Enugu, Adamawa, Kaduna, Ondo, Delta, Oyo, Taraba, Plateau and Edo. A researcher[27] chronicles the attacks carried out by Fulani herders and reported that Fulani herdsmen perpetuated 654 attacks, resulted to the death of 2,539 and abducting of 253 people in Nigeria. This took place between 2017 and 2020 only. Researchers hold the view that the conflict between farmers and herders has led the economic losses and loss of lives and negatively impacted the unity and progress of Nigeria.

The ethno-religious conflict in Southern Kaduna is another dark spot in Nigeria's security architecture. According to researchers,[4,28] the conflict in Southern Kaduna has claimed many lives and many more have been displaced. A researcher[29] attributed the conflict in Southern Kaduna to deep-rooted feeling of mutual suspicion and division among people of the area. A researcher[30] says that the conflict in Southern Kaduna has led to the death of 30, 000 people in the area.

Connecting security with health education

There is a link between the security of lives and property and the health system of a country as well as the overall health status of its people. Security architecture and its impact on the health system of a country can assume different dimensions. The first way that security is linked with the health-care system is that insecurity sometimes leads to attacks on health facilities like hospitals, clinics, and other medical installations aimed at providing medical services to the populace. A researcher[31] regrets that hospitals have become soft targets for terrorists and other anarchists who launch attacks on health-care facilities aimed at recording high casualty numbers. The implication, therefore, is that security discourse is closely related to health-care system. A team of researchers[32] conducted a study with the goal of evaluating the instances of hospital attacks and incidence globally over a time frame of 50 y. The researchers sourced for data for the study through the Global Terrorism Database from 1970 to 2019. The researchers found that 454 terrorist attacks against hospitals took place in 61 countries. The researchers reported further that 52.6% of such attacks aimed at a particular individual. The researchers also found that the number of attacks have continued to grow since 2008. The type of attacks were reported to include the use of explosives and armed assaults while 276 people sustained injuries and 1631 people lost their lives. Based on their results, The team concluded that security challenges are linked to health care because they deny people access to good health-care services.

Another dimension of security that is linked to health is the impact of security on the health of the citizens. Security challenges such as armed result in bodily harm to people, hence it can lead to permanent or temporary disability. A study[33] affirms that armed conflict has a substantial impact on health and the delivery of health-care services to the people.

Security challenges also have implications on the mental health of victims. People who suffer from insecurity are at the risk of developing symptoms of post-traumatic stress disorder (PTSD) as a result of the impact of the violent incidence. A study[34] was conducted to examine the impact of war on the mental health of victims in countries affected by armed conflict and reported that those who suffer from violent attacks reported symptoms of PTSD as well as depression. This means that violent attacks also lead to mental health impact that may negatively affect the reasoning and mental coordination of those affected. A study of researchers[35] in a study reported that exposure to security challenges resulted in feelings of helplessness and fear. The point, therefore, is that victims of insecurity are not typically mentally coordinated to process information and make decisions that will help them. During global pandemics such as COVID-19, victims of insecurity need help to assist them in making decisions regarding their safety.

Reaching vulnerable populations as part of larger health discourse

Access to information is a fundamental human rights of every individual, irrespective of their race, religion, socio-economic status and nationality. Article 21 (2) of the Universal Declaration of Human Rights[36] states, "Everyone has the right to equal access to public service in his country." Access to information is part of the public service that the government of a country renders to their citizens. The citizens have rights to information on security, and public health among others. Perhaps, it is in the exercise of its responsibility that the government of countries took it open themselves to circulate information to the general public to assist them in developing and sustaining life-saving health behavior practice. It is also in the exercise of that role that the government carried information in different media platforms to educate the general public on COVID-19 vaccine and to encourage them to make themselves available for vaccination.

Vulnerable populations, such as victims of insecurity, just like any other members of society, have the right to access information on COVID-19 and the eventual intake of the vaccine. The government has a responsibility to ensure that vulnerable populations are not cheated in an effort to ensure that they are well-educated on the benefits of taking the COVID-19 vaccine so that they will protect themselves against the virus. This is so because COVID-19 virus does not discriminate against socio-status. Also, the peculiar situation of victims of conflict requires that they should be given special attention so that they will not be misled. The delivery of information to victims of conflict has been examined in the literature.

Among the studies to be considered is that of team of researchers[37] who tested the use of theater for development as a useful communication medium for reaching victims of insecurity and persuading them to embrace weaving and painting as a source of income. The researchers examined 470 victims of conflict who were in IDP camps and reported that theater for development was a useful communication intention for assisting victims of insecurity in engaging in painting and avoiding over-dependence on donations for survival.

A team of researchers[38] conducted a study where in they used a quasi-experimental design to determine the usefulness of small group communication intervention in influencing intention to engage in painting as a source of income among victims of

conflict. The researchers examined 470 victims of conflict who were in IDP camps and found that small group communication was a useful communication approach for reaching victims of conflict. It is important to add here that although the studies reviewed above offered information regarding the centrality of packaging and delivering communication interventions to victims of conflict, less attention has been paid to influencing vaccine intakes. Therefore, in this study, attention was paid to vaccine intake among vulnerable populations such as victims of insecurity. Also, the central argument of the current study is that focusing on victims of insecurity vis-à-vis information on public issues like the COVID-19 vaccine is a part of the larger vaccination discourse.

Theoretical framework and hypotheses

This study was anchored on the health belief model. The central argument of the model is that the effectiveness of health information can depend on how they can convince the target receivers that the messages are helpful. The assumption of the model is that people will not adhere to health messages if they are not convinced that there are benefits accruable to adhering to such messages. The model was developed in the 1950s by Rosenstock and his colleagues who tried to explain why health messages succeed or fail.[39] The model outlined the following requirements that determined the effectiveness of health messages-perceived seriousness, perceived susceptibility, perceived benefits of taking action, self-efficacy, barriers to actions and cues to action. According to the model, perceived seriousness explains the degree to which people perceive a health issue as dangerous. Perceived susceptibility explains the degree to which people are vulnerable to contracting health emergence. Perceived benefits explain the thinking regarding the usefulness of practicing health behavior. Barriers to actions are those limitations that will prevent a person from taking action. Self-efficacy is the ability to implement desired actions, irrespective of challenges while cue to actions are those messages that propel actions.[4–42] Researchers[43–45] have applied the health belief model and their results showed that it is a useful framework for assessing health promotion and health behavior.

Based on the health belief model and the studies reviewed, the researchers hypothesized:

H1: Visual illustration messages will be effective in propelling the perceived severity of COVID-19 among victims of armed conflict in Nigeria.

H2: Visual illustration messages will be effective in propelling perceived vulnerability to COVID-19 among victims of armed conflict in Nigeria.

H3: Perceived severity and perceived vulnerability to COVID-19 among victims of armed conflict, will predict intake of COVID-19 vaccine.

Methodology

A quasi-experimental design was used in this study to examine the effect of visual illustrations messages on COVID-19 vaccination among victims of insecurity in Nigeria. The researchers applied a quasi-experimental design because the goal of the study was to assess the impact of an intervention in a non-laboratory condition. The type of quasi experiment that was used was nonequivalent groups design. This type of design requires selecting different groups that have the same attributes but exposing only one group to the treatment condition. The groups in the study were IDP camps where vulnerable populations are taking refuge.

Therefore, through the utilization of a quasi-experiment, the researchers were able to detect the impact of visual messages on actual vaccination among victims of insecurity in Nigeria. The target population of this study was victims of conflict who were in internally displaced person camp as at the time of the study. This set of people was regarded as useful for the study because they have experienced armed conflict and are living in harsh environments that may not allow them access to sufficient information on COVID-19 vaccine.

Sample size

A total of 362 victims of conflict in Nigeria constituted the sample size for the study. The researchers arrived at the sample size after conducting a *priori* power analysis to determine the adequacy of the sample size. This was done with the utilization of G*power program. To be properly guided, the researchers set the effect size (f) as 0.19; the power $(1 − \beta)$ was set at 0.95 while the alpha level (α) as set as $\alpha = .05$. Also in the parameters, the researchers set the test family as *F*-tests, the statistical family was set as ANCOVA repeated measures between factors. The analysis showed that a sample size of 362 was required to determine a statistical relationship between visual messages and COVID-19 vaccination among victims of insecurity. Figure 1 illustrates our results.

Sampling technique

The researchers combined simple, quota and snowball sampling techniques to arrive at the sample size. The researchers combined these sampling techniques using three stages as shown below:

Stage 1

During this stage of the sampling, the researchers randomly selected the IDP camps where the intervention took place. Therefore, IDP camp Area One was selected for the visual intervention group while IDP camp Lugbe was selected for the control group. Both IDP camps were located in Abuja, the Federal capital territory, Abuja. Abuja is one of the locations with the highest number of COVID-19 confirmed cases in Nigeria, hence the reason for the selection of the area. Both camps were selected because they have one highest concentration of IDPs in Abuja. The researchers also selected different camps to reduce the chances of participants from the control group mixing up with those from the treatment group.

It should be noted that victims of conflict from Lugbe and Area One IDP camps are from North-East Nigeria who are displaced by the Boko Haram insurgency.
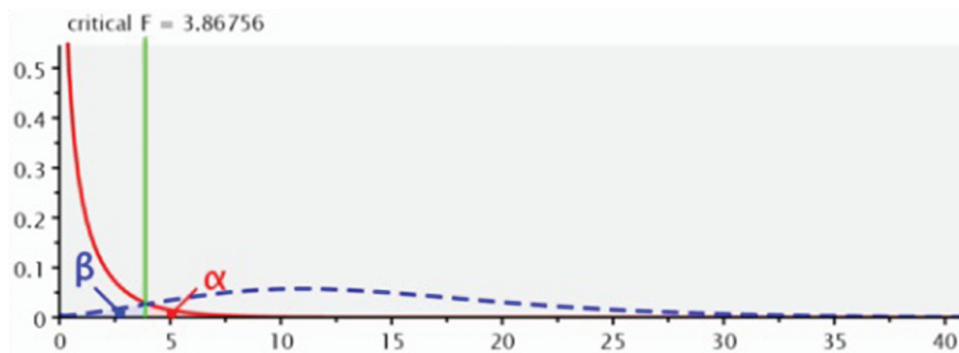
Figure 1. Result of the power analysis.

State 2

The researchers sampled the individual participants. This was done through announcements at the selected camps. Participants who indicated interest registered their intention in the study register that was coordinated by the camp officials.

State 3

The researchers used quota sampling technique to assign respondents to control ($n = 181$) and visual message groups ($n = 181$), respectively. The reason was to ensure even assignment of the participants to the groups. It should be noted that the assignment was done randomly.

Instrument for data collection

The researchers used a structured questionnaire to collect data for the study. This was because of the capacity of the questionnaire to collect data in large amounts. The questionnaire was translated into Hausa following the procedure of a team of researchers.[46] An expert translator in Linguistics and lecturer at University of Abuja who spoke Hausa as a native language translated the questionnaire. Hausa language is the common language spoken by the IDP camps examined. The translated Hausa version of the instrument was back-transferred into English Language by an Hausa PhD holder in English who also lectures in English Department at the University of Abuja. The researchers compared the back-translated with the original version and areas of difference were discussed with constant speakers of the Language at the IDP camps along with one expert translator. After this, suggestions were made and the final version was produced.

Perceived severity items

   (1) COVID-19 can kill.
   (2) COVID-19 can cause serious health discomfort.
   (3) COVID-19 does not pose any public health threat.
   (4) COVID-19 can limit a person from performing his or her daily activities once contracted.
   (5) COVID-19 spreads very fast.

Perceived vulnerability items

   (1) I can contract COVID-19.
   (2) COVID-19 is for only rich people.
   (3) It is difficult for me to contract COVID-19.
   (4) I cannot contract COVID-19 because I hardly go out.
   (5) Anybody can contract COVID-19.

Note: This was a five-point (1–5) Likert scale.

Vaccination

Have you taken COVID-19 vaccine? Yes or No?

Data collection

The researchers collected data for this study three times. The first time was before the intervention to collect baseline data. The second time was after the intervention, which took place 2 weeks after the intervention. There was a 6-month follow-up assessment for greater understanding of the intervention.

The Intervention

The intervention that was used in this study was a visual message strategy that was delivered to the treatment group while also counseling them at the same time on the need for them to take COVID-19 vaccine. The intervention was organized into seven episodes, and each episode lasted for 1 hour. The intervention was delivered in 7 d with one episode per day. The content of the intervention was visual messages that were presented to the participants with the use of a computer and a projector. The visual messages combined video clips, pictures and animations. During the intervention, there was a facilitator who was a certified guidance counselor. The facilitator explained some aspects of the visual messages that needed explanations and also encouraged the participants to take the COVID-19 vaccine. The seven episodes are explained below:

Episode 1

During this episode, the focus was on trying to make the participants to understand the severity of COVID-19.

Therefore, the attention was paid to the number of death recorded and the number of people who have contracted the virus.

Episode 2

Here, the focus was on making the participants understand that they are also vulnerable to COVID-19. The message was to convince them that they can contract the virus and when that happens, they are at the risk of experiencing the consequence.

Episode 3

This episode was aimed at correcting the myth and misinformation regarding COVID-19 and the vaccine. The participants were made to understand that the virus is real and it does not affect only rich people as they may believe. The participants were also made to understand that the vaccine is safe and does not alter their NDA or any of their biological makeup.

Episode 4

The focus of this episode was to assist the participants in building resistance to anyone or group who may attempt to discourage them from taking the vaccine. Participants were made to understand that they were likely to face challenges, but that ability to overcome limitations was needed for them make effort to take the vaccine.

Episode 5

During this episode, the focus was on explaining the benefits of taking the vaccine to the participants. The visual messages focused on letting the victims of conflict understand what they stand to benefit by getting vaccinated.

Episode 6

Here, the participants were exposed to visual messages of COVID-19 vaccine from prominent government officials, including the president of the Federal Republic of Nigeria and how vice. The testimonials also revealed the experiences of those who have taken the vaccine.

Episode 7

The last episode was a summation of all the other six episodes. It was like a revision regarding the intervention. The goal was

Table 1. ANCOVA result on the effect of visual messages on perceived severity of COVID-19.

Time	Condition	Mean	SD	p-value	Decision
Time 1	No visual message group	1.9	.77	.61	Not sig
	Visual message group	1.9	.75		
Time 2	No visual message group	2.0	.80	.001	Sig
	Visual message group	4.1	.71		
Time 3	No visual message group	2.1	.91	.001	Sig
	Visual message group	4.2	.75		

to refresh the memory of the participants and ensure that the messages were well-internalized.

Data analysis

The researchers used percentages, mean and standard deviation among the descriptive statistics. Among the inferential statistics, the researchers made use of analysis of covariance and multiple regression. The independent variable was visual messages, the dependent variable was COVID-19 vaccination while covariate was baseline scores on COVID-19 vaccine intake.

Results

Among the 362 victims of conflict that took part in the study, 351 participants, representing 97% completed the study. Also, 11 participants representing 3%, dropped out of the study. Therefore, the analysis in this study is based on the 351 participants that completed the study. A further break of the return rate showed that 98% ($n = 177$) of the return rate was from the treatment group while 96% ($n = 174$) was from the control group. The results of the study are presented below:

H1: Visual illustration messages will be effective in propelling the perceived severity of COVID-19 among victims of armed conflict in Nigeria.

The researchers computed Table 1 to ascertain the impact of visual messages on the perceived severity of COVID-19 among victims of conflict and it was found that there was a significant main effect of the treatment condition and perceived severity of COVID-19 among the victims of conflict in took part in the study, $F(1,348) = 909.938$, $p = .001$, eta squared .723. The result further revealed a significant moderating role of baseline results on the main effect, $F(1,348) = 52.741$, $p = .001$. Based on these results, the first hypothesis was supported and it is concluded that visual messages were effective in propelling the perceived severity of COVID-19 among victims of conflict in Nigeria.

H2: Visual illustration messages will be effective in propelling perceived vulnerability to COVID-19 among victims of armed conflict in Nigeria.

The results of Table 2 revealed the impact of visual messages on the perceived vulnerability to COVID-19 among the victims of conflict in Nigeria. The result showed a significant main effect of the treatment condition and perceived vulnerability to COVID-19 among the victims of conflict who took part in the study, $F(1,348) = 727.941$, $p = .001$, eta squared .774. The result further revealed a significant moderating role of baseline results on the main effect, $F(1,348) = 9.806$, $p = .002$. Based on these results, the second hypothesis was supported and it is concluded that visual messages were effective in propelling perceived vulnerability to COVID-19 among victims of conflict in Nigeria.

Table 2. ANCOVA result on the effect of visual messages on perceived vulnerability to COVID-19.

Time	Condition	Mean	SD	p-value	Decision
Time 1	No visual message group	1.9	.77	.75	.670
	Visual message group	1.9	.75		
Time 2	No visual message group	2.0	.80	.001	Sig
	Visual message group	4.0	.48		
Time 3	No visual message group	2.3	.76	.001	Sig
	Visual message group	4.1	.61		

H3: Perceived severity and perceived vulnerability to COVID-19 among victims of armed conflict, will predict intake of COVID-19 vaccine.

The result of Table 3 revealed the predictive capacity of perceived severity and perceived vulnerability on the intake of COVID-19 vaccine among victims of conflict who took part in the study. It was found that the model contributes 69.2.% in explaining COVID-19 vaccination among victims of conflict in Nigeria, $R^2 = .692$, $p = .001$, $F(3,411)$ 59.524. Therefore, the last hypothesis was upheld. Comparatively, perceived vulnerability ($\beta = .558$) contributed more than perceived severity ($\beta = .381$). Table 4 shows the actual COVID-19 vaccination between the control and treatment groups.

The result of Table 4 examined the impact of visual messages in actual COVID-19 vaccination among victims of conflict in Nigeria. The result showed that participants who received the intervention reported been vaccinated while those who did not receive the intervention largely remained unvaccinated.

Discussion of findings

The goal of this study was to examine the effect of visual messages in propelling actual COVID-19 vaccination among victims of insecurity in Nigeria. The researchers focused on people who have been displaced by violent conflict. The study tested three hypotheses at 0.05 level of significance. In the first hypothesis, it was assumed that visual illustration messages will be effective in propelling the perceived severity of COVID-19 among victims of armed conflict in Nigeria. This hypothesis was supported because the result showed that visual messages were effective in propelling the feeling of perceived severity of COVID-19. This result agrees with that of Okpara

Table 3. Regression analysis of the predictive power of perceived severity and perceived vulnerability on COVID-19 vaccination.

Perception	Constant	β Value	R square	F value	p-value
Perceived severity	3.302	.381	.692	59.524	.001
Perceived vulnerability		.558			.001

Table 4. COVID-19 vaccination among the victims of conflict in Nigeria.

Time	Condition	Vaccinated	Not vaccinated	Total
Time 1	No visual message group	13%	87%	100%
	Visual message group	12.%	88%	100%
Time 2	No visual message group	18%	82%	100%
	Visual message group	74%	26%	100%
Time 3	No visual message group	19%	81%	100%
	Visual message group	95%	5%	100%

et al.[44] who found that exposure to appropriate messages will be effective in promoting feeling of perceived seriousness of public health issues.

In the second hypothesis, the researchers hypothesized that visual illustration messages will be effective in propelling perceived vulnerability to COVID-19 among victims of armed conflict in Nigeria. This hypotheses was also supported and the researchers concluded with 95% confidence that visual messages will trigger feeling of vulnerability to COVID-19. This result is consistent with that of team of researchers who reported that communication interventions are important health promotion strategies for fueling perceived vulnerability.

In the final hypotheses, the researchers hypothesized that perceived severity and perceived vulnerability to COVID-19 among victims of armed conflict will predict intake of COVID-19 vaccine. This hypotheses was also supported and it is concluded that variables from health belief model contribute in influencing health behavior. This result is consistent with that of Oyeoku et al.[45] who reported that variables from health belief model life perceived severity and perceived vulnerability influence health behavior initiation and sustenance.

The result of the study also showed that visual messages were effective in increasing COVID-19 vaccination among victims of conflict. We found that vaccination among the participants in the visual intervention improved from 12% before the visual intervention to 74% after the intervention and 95% after 6 months' follow-up assessment. However, vaccination for the no visual intervention slightly improved from 13% to 18% and 19% respectively within the same time framework. The implication of these result is that visual messages were effective in promoting actual COVID-19 vaccination among victims of conflict in Nigeria.

The result of this study has extended previous studies that have examined the impact of visual messages without linking it to health promotion among victims of conflict. This addition has provided fresh perspectives in the literature concerning the impact of pictures on peoples' thinking as well as their behavior. This new perspective could serve as a blueprint in designing and implementing interventions aimed at assisting victims of conflict to modify their behavior based on realities within their immediate environment.

The results of this study have broaden the dimensions of security discourse by showing that victims of conflict require special interventions to meet their information needs, especially during public emergencies as is the case with COVID-19. Addressing the challenges facing victims of conflict is part of a larger security discourse as doing so will deepen our understanding of all the aspects of security issues. This is important because security does not begin and end with causes, and solutions, those who are victims of insecurity are also part of the larger discourse issues and their welfare needs to be treated with every seriousness.

Conclusion/Recommendations

The researchers conclude that visual messages are effective communication tools for reaching victims of conflict. When

victims of conflict are presented with information through visual messages, it enhances their understanding and, eventually, influences their behavior. The researchers equally conclude that visual messages are effective in triggering victims of conflict to understand the severity of COVID-19 and their vulnerability to it. The additional conclusion is that perceived severity and perceived vulnerability to COVID-19 predict actual vaccination among victims of conflict. The result of this study has theoretical, scholarly and practical implications. In the area of theory, the result of this study has offered a fresh perspective related to the health belief model by explaining how visual messages propel the feeling of perceived severity and perceived vulnerability among victims of conflict. This understanding could be useful for other researchers who may want to apply this model in the study of health promotion among the less privileged in society. The result of the study equally has implications on scholarship by providing new perspectives regarding the usefulness of visual messages on health promotion vis-à-vis victims of insecurity. This evidence could shape future debates related to the impact of visual messages, especially in reaching vulnerable groups. Finally, the result of this study has implications on security discourse by expanding beyond the causes and solution to insecurity but focusing on ways of providing important health information to victims of conflict during public health emergencies like COVID-19. Further studies are recommended to examine broader issues related to victim of insecurity such as family planning, distance learning, among others.

Disclosure statement

Funding

ORCID

Gever Verlumun Celestine http://orcid.org/0000-0003-0618-5352

References

1. Jackson L, Kuhlman C, Jackson F, Fox PK. Including vulnerable populations in the assessment of data from vulnerable populations. Front Big Data. 2019;2:2. doi:10.3389/fdata.2019.00019.
2. Wilson D, Neville S. Culturally safe research with vulnerable populations. Contemp Nurse. 2009;33(1):69–79. doi:10.5172/conu.33.1.69.
3. González-Uribe C, Olmos-Pinzón A, Leóngiraldo S, Bernal O, Moreno-Serra R. Health perceptions among victims in post-accord Colombia: focus groups in a province affected by the armed conflict. PLoS ONE. 2022;17(3):e0264684. doi:10.1371/journal.pone.0264684.
4. Asogwa CE, Okeke SV, Ezeah G, Gever VC. Television and conflict reporting: framing of ethno-religious conflict in Southern Kaduna by Nigerian television authority and channels television. Secur J. 2022;35(1):82–97. doi:10.1057/s41284-020-00267-x.
5. Chiluwa I, Chiluwa I. 'Deadlier than Boko Haram': representations of the Nigerian herder–farmer conflict in the local and foreign press. Media War Conflict. 2020;15(1):3–24. doi:10.1177/1750635220902490.
6. Kwaghtser PA. Impact of the conflict between farmers and herdsmen on food production in the agro-ecological zone-B of Benue State, Nigeria. Ianna J Interdiscip Stud. 2019;1:56–64.
7. Omaka A. Conquering the home front: radio Biafra in the Nigeria–Biafra War, 1967–1970. War Hist. 2017;25(4):555–75. doi:10.1177/0968344516682056.
8. Okeke SV, Okwumba O, Ezeah G, Gever VC. Journalism practice in a country facing division threats: newspaper framing of secession agitations in Nigeria. Lib Philos Pract. 2019;(e–journal):1–22.
9. Ogbonne PI. Cutting the head as cure for headache: exploring the economic impact of Niger Delta militancy on host communities. Ianna J Interdiscip Stud. 2019;1:76–84.
10. Obi-Ani N, Obi-Ani P. Pan – Africanism and the rising ethnic distrust in Nigeria: an assessment. Ianna J Interdiscip Stud. 2019;1:65–75.
11. Naik A. Impact of conflict on mental health with special reference to Kashmir Valley. Intl J Indian Psychol. 2018;7(1):119–129.
12. Meier LL, Semmer NK, Gross S. The effect of conflict at work on well-being: depressive symptoms as a vulnerability factor. Work Stress. 2014;28(1):31–48. doi:10.1080/02678373.2013.876691.
13. Akuto G. Challenges of internally displaced persons (IDPs) in Nigeria: implications for counselling and the role of key stakeholders. Intl J Inno Psych Soc Dev. 2017;5:21–27.
14. World Health Organization. WHO coronavirus (COVID-19) dashboard; 2022a [accessed 2022 Oct 20]. https://covid19.who.int/
15. World Health Organization. Coronavirus disease (COVID-19) vaccines; 2022b [accessed 2022 Oct 20]. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-adetail/coronavirusdisease
16. Vanichvasin P. Effects of visual communication on memory enhancement of Thai undergraduate students, Kasetsart University. Higher Educ Stud. 2021;11(1):34–41. doi:10.5539/hes.v11n1p34.
17. Chang C. Seeing is believing: the direct and contingent influence of pictures in health promotion advertising. Health Commun. 2013;28(8):822–34. doi:10.1080/10410236.2012.726403.
18. El-Ghitany EM, Ashour A, Omran EA, Farghaly AG, Hassaan MA, Azzam NFAEM. COVID-19 vaccine acceptance rates and predictors among the Egyptian general population and Healthcare workers, the intersectionality of age and other factors. Sci Rep. 2022;12(1):19832. doi:10.1038/s41598-022-23825-2.
19. Sallam M, Al-Sanafi M, Sallam M. A global map of COVID-19 vaccine acceptance rates per country: an updated concise narrative review. J Multidis Healthcare. 2022;15:21–45. doi:10.2147/JMDH.S347669.
20. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K, Kimball S, El-Mohandes A. A global survey of potential acceptance of a COVID-19 vaccine. Nat Med. 2021;27(2):225–28. doi:10.1038/s41591-020-1124-9.
21. The Institute for Peace and Economics. Global terrorism index; 2022 [accessed 2022 Oct 20]. https://www.economicsandpeace.org/wp-content/uploads/2022/03/GTI-2022-web09062022.pdf
22. Premium Times. Boko Haram: 350,000 dead in Nigeria—UN; 2022 [accessed 2022 Oct 20]. https://www.premiumtimesng.com/news/headlines/470476-insurgency-has-killed-almost-350000-in-north-east-undp.html
23. United Nations Refugee Agency. Nigeria emergency; 2021 [accessed 2022 Oct 20]. https://www.unhcr.org/nigeria-emergency.html
24. Oyero K Despite 3,125 killed by bandits in 2021, Lai Mohammed says Buhari made 'tremendous progress'. Punch; 2021 [accessed 2022 Oct 20]. https://punchng.com/despite-3125-killed-by-bandits-in-2021-lai-mohammed-says-buhari-made-tremendous-progress/
25. Ugwu C, Etumnu E, Talabi F, Fadeyi I, Aiyesimoju A, Apuke OD, Gever VC. Journalism and reportage of insecurity: newspaper and

television coverage of banditry activities in Northern Nigeria. Newsp Res J. 2022;43(3):343–57. doi:10.1177/07395329221112393.

26. Amnesty International. Harvest of death: three years of bloody clashes between farmers and herders; 2018 [accessed 2022 Oct 20]. https://reliefweb.int/report/nigeria/harvest-death-three-years-bloody-clashes-between-farmers-and-herders

27. Bayo A. Report: Fulani Herdsmen killed 2,539 Nigerians in 654 attacks. *ThisDay*; 2020 [accessed 2022 Oct 30]. https://www.thisdaylive.com/index.php/2020/06/07/report-fulani-herdsmen-killed-2539-nigerians-in-654-attacks/

28. Lamorde Z. Managing ethno-religious identity conflicts in Kaduna State, Nigeria. J Hum Soc Sci. 2018;23:51–57.

29. Shiklam J The unending cycle of violence in Kaduna; 2018 [accessed 2022 Oct 30]. https://www.thisdaylive.com/index.php/2018/11/12/the-unending-cycle-of-violence-in-kaduna/

30. Hoffmann L. Violence in Southern Kaduna threatens to undermine Nigeria's democratic stability; 2017 [accessed 2022 Oct 20]. https://www.chathamhouse.org/expert/comment/violence-southern-kaduna-threatens-undermine-nigeria-s-democratic-stability#.

31. Tavares W. Impact of terrorist attacks on hospitals. J Emerg Nurse. 2018;44(2):188–90. doi:10.1016/j.jen.2017.11.012.

32. Ulmer N, Barten D, De Cauwer H, Gaakeer M, Klokman V, Van der Lugt M, Mortelmans LJ, van Osch FHM, Tan ECTH, Boin A. Terrorist attacks against hospitals: world-wide trends and attack types. Prehosp Disaster Med. 2022;37(1):25–32. doi:10.1017/S1049023X22000012.

33. Sidel VW, Levy BS. The health impact of war. Intl J Inj Contr Saf Promot. 2018;15(4):189–95. doi:10.1080/17457300802404935.

34. Hoppen TH, Priebe S, Vetter I, Nexhmedin M. Global burden of post-traumatic stress disorder and major depression in countries affected by war between 1989 and 2019: a systematic review and metaanalysis. BMJ Glob Heal. 2021;6(7):e006303. doi:10.1136/bmjgh-2021-006303.

35. Zhong B, Huang Y, Liu Q. Mental health toll from the coronavirus: social media usage reveals Wuhan residents' depression and secondary trauma in the COVID-19 outbreak. Comp Hum Behav. 2021;114:106524. doi:10.1016/j.chb.2020.106524.

36. United Nations. Universal Declaration of Human Rights, 198 [accessed 2022 Oct 20]. https://www.ohchr.org/sites/default/files/UDHR/Documents/UDHR_Translations/eng.pdf

37. Obasi T, Okpara C, Okpara F, Itiav V, Gever VC. Effect of theatre for development as a communication intervention strategy on behavioural intentions towards painting, weaving and fashion

and design among victims of conflict in Nigeria. Afri Sec Rev. 2021;30(2):139–51. doi:10.1080/10246029.2020.1857805.

38. Gever VC, Olajide T, Omowale A, Sanisu B, Talabi M. Modeling predictors of COVID-19 health behaviour adoption, sustenance and discontinuation among social media users in Nigeria. Telemat Inform. 2021; 60:101584. doi:10.1016/j.tele.2021.101584.

39. Rosenstock IM. Historical origins of the health belief model. Health Educ Mono. 1974;2:328–35. doi:10.1177/109019817400200403.

40. Champion V, Skinner CS. The health belief model. In: Glanz K, Rimer B, Viswanath K, editors. Health behavior and health education. United States of America: Jossey-Bass; 2018. p. 45–65.

41. Jones C, Jensen J, Scherr C, Brown N, Katheryn C, Weaver J. The health belief model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. Health Commun. 2015;30(6):566–76. doi:10.1080/10410236.2013.873363.

42. Scarinci I, Bandura L, Hidalgo B, Cherrington A. Development of a theory based, culturally relevant intervention on cervical cancer prevention among Latina immigrants using intervention mapping. Health Promo Pract. 2012;13:29–40. doi:10.1177/1524839910366416.

43. Gever VC, Talabi F, Anibueze A, Okparsa C, Ugwuoke J. Effect of small group communication counseling intervention strategy on knowledge and intention towards painting among internally displaced persons of the farmers/herdsmen conflict in Benue State, Nigeria. J Refug Stud. 2021;34(4):4322–35. doi:10.1093/jrs/feaa132.

44. Okpara CV, Anibueze A, Talabi OF, Omowale A, Gever VC. The moderating role of colour in modelling the effectiveness of COVID-19 YouTube animated cartoons on the health behaviour of social media users in Nigeria. Health Promot Int. 2021;36 (6):1599–609. doi:10.1093/heapro/daab001.

45. Oyeoku EK, Talabi FO, Oloyede D, Boluwatife AA, Gever VC, Ibe E. Predicting COVID-19 health behaviour initiation, consistency, interruptions and discontinuation among social media users in Nigeria. Health Promo Intl. 2021;37(1):1–12. doi:10.1093/heapro/daab059.

46. Chukwuorji JC, Ifeagwazi CM, Eze JE. Role of event centrality and emotion regulation in posttraumatic stress disorder symptoms among internally displaced persons. Anxiety Stress Copy. 2017;30(6):702–15. doi:10.1080/10615806.2017.1361936.