Fear Message and Adoption of Barrier Measures: A Study of COVID 19 in the Cameroonian Population

ABSTRACT

Fear appeals have long been a means of persuasion to promote favorable health behaviors. In the case of COVID-19 in particular, the mere presence of this epidemic seems to have the psychological consequence of fear in many individuals. Resorting to fear appeals becomes an adjunct in the fight against this disease, which is characterized by uncertainty despite the vaccine proposals that litter the horizon. The purpose of this paper is to identify variables that may promote the adoption of barrier measures related to COVID-19. To accomplish this, we conducted an online survey and processed the resulting data via SPSS.21 and Amos software. The results show that perceived efficacy, self-efficacy, and fear messages based on cultural practices are relevant for promoting adoption of recommendations against COVID-19. In contrast, repeated fear messages and government statistics were not found to be very effective. On this basis, we recommended that persuasive communication actors focus on fear messages in relation to the cultural aspects to which the population is much more attached. They should amplify communication about compliance with anti-Covid-19 barrier measures.

1. INTRODUCTION

Many humanitarian crises have put the world on alert, but disease outbreaks are inevitable and often unpredictable (WHO, 2005). SARS (Severe Acute Respiratory Syndrome), the Black Death, Ebola or cholera have claimed victims alongside AIDS, which has been indexed as the greatest health catastrophe known to humanity (Larsen, 1998). Despite more than 32.7 million deaths worldwide (UN AIDS, 2020), all the attention that AIDS and similar epidemics have received has been redirected to CORONA in view of the disasters it has caused. The "corona virus ~~deseasedisease~~" (COVID-19) appeared in China in late 2019 before spreading to all continents. Transmitted by SARS-CoV-2, this disease spreads very quickly with high risks of mortality in several people. At the center of all health debates at present, the WHO (2021) counts nearly 3,419,568 deaths in the world as of May 19, 2021, including 124,789 deaths in Africa and 1,189 in Cameroon. Given the powerlessness of governments to respond immediately, the interim solution is to stop the circulation of the virus by reducing or limiting human travel followed by awareness raising on a number of anti-Covid measures. These are commonly referred to as "barrier measures". They consist of "frequent hand washing with running water and soap or a hydroalcoholic solution", "maintain a distance of at least 1 meter from others", "avoid touching eyes, nose and mouth", "cover mouth and nose when coughing or sneezing", "blow your nose in a single-use handkerchief", "stay at home and limit outings", "wear a mask". The dissemination of these guidelines and their implementation calls for public health communication mechanisms.

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Comment [AK2]: I suggest rewording this as "Avoid crowding -maintain a distance…."

Comment [AK3]: This recommendation is questionable. Any reference of where it is recommended? I suggest revising this statement in line with current evidence as provided in the following publications (you may cite these for evidence):
A) Hartley DM, Perencevich EN. Public Health Interventions for COVID-19: Emerging Evidence and Implications for an Evolving Public Health Crisis. *JAMA.* 2020;323(19):1908–1909. doi:10.1001/jama.2020.5910

B) Güner R, Hasanoğlu I, Aktaş F. COVID-19: Prevention and control measures in community. Turk J Med Sci. 2020 Apr 21;50(SI-1):571-577. doi: 10.3906/sag-2004-146. PMID: 32293835; PMCID: PMC7195988.

C) Ayouni I, Maatoug J, Dhouib W, Zammit N, Fredj SB, Ghammam R, Ghannem H. Effective public health measures to mitigate the spread of COVID-19: a systematic review. BMC Public Health. 2021 May 29;21(1):1015. doi: 10.1186/s12889-021-11111-1. PMID: 34051769; PMCID: PMC8164261.

The development of informative and persuasive communications was the only viable strategy to reduce the rate of spread of the AIDS virus in the 1990s (Brown, 1991) and this seems to be true today for COVID-19. Indeed, through awareness and prevention campaigns, social marketing has proven itself in several areas of public health: smoking (Gallopel and Petr, 2000), alcoholism (Becheur et al, 2007), dental hygiene (Janis and Feshbach, 1954), etc. Besides these scourges, the COVID-19 pandemic is still waiting for a definitive vaccine or official carrier treatment. In the meantime, it benefits from a proliferation of awareness campaigns encouraging the adoption of "barrier measures". For example, FIFA and WHO have initiated a campaign ("Spread the word to eliminate the coronavirus"), involving world-renowned footballers as bearers of a message to the entire planet on key measures to stop the spread of the virus. The EttuJamm platform launched the "AAR JIGEEN AAR SA REW TAKAL SA MASK" campaign to urge governments to implement strategies that take into account the specific needs of women and girls in terms of prevention and protection against COVID-19. In Africa, the Red Cross and MINUSCA are also multiplying actions in this direction. In addition to these organizations, the fight against this disease is also being waged at the local level. In Cameroon, for example, city authorities and non-governmental organizations are raising awareness about the adoption of "barrier measures". The cell phone companies provide the relay by using the "funtones" linked to the respect of these measures. All media outlets have slots to broadcast awareness messages. Statistics on the evolution of this disease are made available to the population on a daily basis via the different media. This information can have among other objectives the activation of fear in the audience.

Comment [AK4]: This statement could be edited to be more specific. Perhaps the author meant a definitive preventive vaccine? For example it is not clear what the author means by stating "waiting for a definitive vaccine or official carrier treatment" . Today vaccines are playing an important role in protecting individuals from severe disease and reducing risk of death even though not blocking transmission of COVID19. The author may update the statement and citing the reference may be helpful: Massetti GM, Jackson BR, Brooks JT, et al. Summary of Guidance for Minimizing the Impact of COVID-19 on Individual Persons, Communities, and Health Care Systems — United States, August 2022. MMWR Morb Mortal Wkly Rep 2022;71:1057-1064.
DOI: http://dx.doi.org/10.15585/mmwr.mm7133e1

Many studies have tested the effect of fear appeals in health responses (Janis and Feshbach, 1954; Gallopel and Petr, 2000; Becheur et al, 2007). In the realization of scenarios for fear intensity, low fear is typically materialized by text that evokes risk, suffering, or explicitly death and high fear by colorful shock images (Janis and Feschbach, 1954; Block and Keller, 1997; Courbet, 2003; Becheur et al, 2007). These studies have ignored the cultural aspects of the messages disseminated, yet each country has its own cultural specificities which could be very important for the proper management of health crises. The cultural disparities in Africa cannot be ignored in view of the importance of culture for its populations. The degree of adherence to cultural practices and the beliefs that underlie them can foster a certain way of perceiving health risks. On a practical level, persuasive communications about epidemics usually involve religious and traditional leaders in the fight against them, thus emphasizing the role of culture in the adoption of the measures advocated. Thus, it is interesting to understand how adherence to the values and practices of cultural traditions in Cameroon may affect behavior towards COVID-19. Based on these elements, this study finds it appropriate to educate the community on the effect of culturally based fear messages in the adoption of barrier measures against COVID-19. This is especially true since recommendations for mortuary procedures related to COVID-19 generally run counter to people's ideals about the management of dead bodies. In addition, like the level of fear activated, the effectiveness of the recommendations and the self-efficacy of the target are among the variables that contribute to the effectiveness of fear-based campaigns (Witte, 1992).

The messages in prevention campaigns are addressed to a target population in different forms (images, speeches, repressive actions, writings...) (Kouabenan, 1999). In the response to VTEC-19, most developed countries initially opted for total containment of the population, unlike less developed countries such as Cameroon, which reduced containment measures. Moreover, compared to what is done in Western countries where awareness is based on shocking images (images of thousands of coffins or dying patients), in Cameroon, we limit ourselves to the dissemination of statistics on the evolution of the disease. In view of these contradictions in the fight against COVID-19, we find it appropriate to analyze the

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effectiveness of recommendations and self-efficacy in a particular context with specific realities. Following this logic, the objective of this paper is to determine the variables related to fear, which are likely to promote the adoption of barrier measures related to COVID-19. After presenting a brief review of the literature on the use of fear appeals in epidemiological situations, we will review the current state of preventive measures on COVID-19 before looking at how fear appeals work in preventive communication. This will be followed by the methodology used to conduct the tests, the results and a discussion of the results.

2. LITERATURE REVIEW

2.1 Persuasive communication and the response to epidemics

In the case of health risks, prevention messages or actions aim to show the target how vulnerable it is, to draw its attention to the risks involved in order to encourage the adoption of a new behavior (Girandola, 2000; Pechman, 2001). The lack of a drug solution has encouraged the development of persuasive communication initiatives to limit the spread of epidemics. In practice, governments generally use fear appeals to encourage people to adopt measures to limit the damage. In the case of the fight against the AIDS pandemic, persuasive communication influences knowledge, attitudes, risk behaviors, and the decision to seek care or treatment (Storey et al., 2014). Thus, in response to the spread of the AIDS epidemic in the general population, the communication media available to infected countries have been saturated with shocking images (images of skeletal people devastated by the disease, images of a virus bordering on ugliness...), and slogans (AIDS kills; all together for the fight against AIDS; AIDS will not pass through me; do not use objects used or soiled with the blood of the sick; I have taken my test and you? If you don't do anything, there is nothing...). The actors in the fight have also initiated campaigns to encourage the use of condoms (pinch, unroll...), or to test for HIV for free. In the face of these multiple preventive communication initiatives, some experts believe that, as a general rule, fear-based campaigns only have the desired effect on people who are still unaware of the seriousness of the threat (Jansen et al., 2008). In particular, fear appeals can deter HIV-positive people from starting or continuing treatment (Slavin et al., 2007). In fact, a 2005 meta-analysis of fear-based campaigns to prevent HIV found that scaring people did not work (Albarracin and Gillette, 2005). However, Marchand and Filiatrault (2002) argue that negative emotional strategies related to this struggle had a more positive impact on behavioral intentions than positive emotion-based messages. These contradictions have not stopped the use of fear appeals in the prevention of other epidemics.

In view of the number of deaths caused by Ebola between 2014 and 2016 (11,308 deaths according to the WHO), a series of measures were taken by Ivorian leaders, including a ban on hugging; a ban on shaking hands; a ban on eating bushmeat; and a ban on touching people who have been infected with and/or died from the disease. In terms of communication, the promotion of behaviors favorable to the control and prevention of the disease was on the agenda. In fact, several messages regarding preventive measures for the population were developed and disseminated through the media and any other possible channel, followed by the establishment of a hotline available to the population as is usually the case in health emergencies.

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Cholera continues to be rampant despite the development of three cholera vaccines. There are 1.3 to 4 million cases of cholera each year, and 21,000 to 143,000 deaths from the disease worldwide (WHO, 2017). WHO in its recommendations encourages the use of fear messages and emphasizes the importance of people's engagement in eradicating the epidemic. It advocates hygiene promotion and social mobilization in cholera prevention. Indeed, communities must be educated on the potential risks, the symptoms of cholera, the

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precautions to take to protect themselves against the disease, but especially on the need to consult immediately when symptoms appear.

Concerning the H1N1 flu, awareness campaigns in France promoted the idea that protecting oneself would protect others ("everyone's actions make everyone healthy"). To promote the H1N1 vaccine, the daily broadcast of statistics on the evolution of the disease was combined with announcements on the extreme contagiousness and the specific fatal risk of this infection. This persuasion by fear has been criticized by Ferron (2010), who questions the scope of fear mongering in the context of this flu, and finally concludes that such a campaign was ineffective in France. At this level, the observation is that the use of fear appeals is an obvious way to fight against epidemics, especially since the population is always aware of the risks of epidemics that they face.

2.2 State of the art on persuasive communication in the case of COVID-19

The topic of COVID-19 has already attracted the interest of several authors. In a short period of time, the number of works that have contributed to the fight against this disease has multiplied. In persuasive communication, authors such as Addo et al. (2020), The Khoa et al. (2021), Yang et al. (2020) and Pakpour et al. (2020) have each experimented with variables that have reiterated the contribution of fear appeals in the promotion of healthy behaviors. In this regard, Kiigatira et al. (2020) find that fear appeals have promoted the adoption of barrier measures in the fight against COVID-19 in Kenya. Indeed, in Kenya, the fear engendered by quarantining suspects, multiple police arrests, charging fines, and impounding motorcycles that were being ridden contributed to the adoption of the recommendations. The Khoa et al. (2020) attempted to demonstrate that prevention-based messaging was more persuasive than promotion-based and conventional messaging in reinforcing compliance with physical restraint. In other words, prevention through negative messages was more effective in promoting engagement in physical distancing in services than promotion through positive messages. This finding is consistent with Meyerowitz and Chaiken (1987), who note that negatively worded information is more persuasive than positively worded information in changing health behaviors. The work of Yang et al. (2020) demonstrates that message repetition does not influence perceived susceptibility; perceived effectiveness is very low in influencing behavioral intention. The scientific contribution of this work only complements what is actually being done in the field.

Thus, raising awareness in the case of COVID-19 through fear appeals has required a plethora of message delivery channels. The media and social networks continuously feed the fear of the corona virus through broadcasts and information on the status of the pandemic. In all media, there are slots for broadcasting awareness messages on compliance with barrier measures. TV talk shows are sometimes organized to analyze the government's response to COVID-19 and make new suggestions. Regular statistics on the status of the disease are made available to the public, as well as the various measures taken by the government to respond effectively to the crisis. Communication through the media is reinforced by non-media communication.

Contributions to the fight against COVID-19 come from different actors. The cell phone companies ensure the relay by using the "funtones" linked to the respect of these measures. These companies are also the preferred channel for the various ministries involved in the fight to convey their expectations to the population during this period of crisis, in the form of SMS (MINSANTE, MINPROF, MINESEC, etc.). Freephone numbers are available to the public (1510) in case of emergency. The administrative authorities (governors, SDOs and DOs) traditional and religious authorities have not remained indifferent to this situation. The

various communiqués to the public have several objectives: to raise awareness about the consequences of not respecting the recommendations and to formulate prohibitions to the inhabitants of their district. Newspapers take over from television news with the broadcasting of all information related to the pandemic. The virulence of COVID-19 required another form of persuasive communication: outreach, Political party activists, Red Cross volunteers, or so-called "citizen companies" have taken initiatives in the field. They inform the population orally about the importance of applying the barrier measures.

The sensitization of the population against COVID-19 is also done through several initiatives to facilitate the adoption of barrier measures by the population. This ranges from the distribution of masks, hydroalcoholic solutions, buckets or soaps to the installation of water stations for regular hand washing in different street corners. The health centers also benefit from the government or private individuals who donate the necessary materials to treat the patients. In spite of all these initiatives, there is still a timidity in the adoption of barrier measures, hence the relevance of the choice of variables to be used to increase the awareness of the populations on the health issue.

2.3 Prevention through fear: what synergy to ensure effectiveness?

It is imperative that the response be organized in an optimal manner in view of the importance of the economic, social and health costs of epidemics. Despite controversies about the use of fear appeals, they have already proven successful in a variety of areas: dental hygiene (Janis and Feschback, 1953), tobacco control (Girandola, 2000), alcohol abuse control (Becheur and Valette-florence, 2014), influenza vaccination (Ferron, 2010). COVID-19 is an appropriate field for experimentation as governments have overwhelmingly adopted fear appeals as a means of raising awareness. Several methods of fear appeals have been considered. These include repetition of messages, daily dissemination of statistics on the number of cases, and messages that question the habits and customs of the population, particularly in the case of the management of COVID-19 decedents.

The repetition of fear messages is almost unavoidable in persuasive communication. During epidemics, populations are exposed even involuntarily several times through different communication channels to fear messages. The work of authors such as Courbet (2003); Chappé et al. (2007); Girandola and Michelik (2008); Courbet et al. (2013), testify to this and prove the effectiveness of the repetition of fear messages in promoting healthy behaviors. Currently, as part of the health response to COVID-19, the global population and Cameroonian population in particular is exposed to recurrent awareness messages. The relevance of this repetition of fear messages has been previously proven in similar contexts and we are optimistic about their effect on the adoption of the barrier measures enacted for the fight against COVID-19.

Statistics on COVID-19 are made available to the public to confront them with the danger of this disease. The WHO publishes on its website the state of play on this disease and the data are updated regularly. The Cameroonian government also informs the public about the evolution of the disease through the media (numbers of infected, deaths, cured...). Moreover, according to Lévy-Leboyer and Moser (1977), the effectiveness of fear messages also depends on the style of the message (statistics, figures, images, etc.). Based on these statements, we assume a similar effect in this pandemic context.

Victims in epidemiological situations have generally been given special burials in order to limit the damage. In the case of this COVID-19 pandemic, specific measures have been adopted for the deceased in several countries. In Cameroon, consecutive communiqués from the authorities state the posture to adopt in case of death related to COVID-19. Among others, we have the burial within 48 hours of death by a medical team within two days, the

limitation of the number of people at all events to 50. These measures constitute an obstacle to the fulfillment of local customs and usual funeral rites, which are fundamental in African customs. Indeed, for the most part it is desirable to bury any deceased in his locality of origin and by his relatives. In addition, funerals are places of meeting and reunion of all the people concerned by the death. Thus, the appreciation of funeral ceremonies also depends on the popular mass that has participated. Some studies show that cultural beliefs inhibit intentions to engage in risky health behaviors (Goggin et al., 2007). Finally, while in some cultures mortuary practices are negligible, in others they are of particular interest. For example, fear of uncertainty about the location of burial and/or the conduct of the funeral may influence decisions to adopt barrier measures. We therefore assume that the adoption of barrier measures varies according to the forms of fear activation, hence the hypotheses below:

H1: Fear emotion due to message repetition promotes adoption of barrier measures against COVID-19

H2: The emotion of fear due to statistics on COVID-19 positively influences the adoption of barrier measures

H3: Fear messages based on cultural practices promote the adoption of barrier measures against COVID-19.

Questions about the ability of fear to induce a change in attitude or behavior are not new. Lévy-Leboyer and Moser (1977) concluded that the effectiveness of fear as a persuasive argument varies greatly depending on the situation. It depends, among other things, on the nature of the message (numbers, statistics, images, etc., the effectiveness of the recommendations, etc.) and on the criteria for effectiveness (arousing interest, changes in opinion or attitude, behavioural intentions, compliance of the behaviour with the instructions given). Moreover, the success of a prevention campaign based on fear appeal depends on the perceived threat, the perceived effectiveness of the proposed prevention measures and, above all, the self-efficacy of the recipients (Leventhal, 1971; Witte, 1992). Witte's model (1992) emphasizes the importance of accompanying high fear messages with effective recommendations. With regard to self-efficacy, the literature agrees on the importance of reinforcing the subject's ability to put the recommendations into practice (Girandola, 2000). For example, fear-based AIDS strategies were more effective with people who had a higher sense of self-efficacy (Hasting et al., 2004). Studies also show that self-efficacy has a positive influence on intentions to adopt the solution recommended by the threatening message (Block & Keller, 1997). Thus, we posit that,

H4: Self-efficacy positively influences the adoption of COVID - 19 recommendations

H5: The more effective the recommendations are, the more individuals adopt them in the COVID - 19 framework.

Based on the above hypotheses, the following research model is proposed:

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Comment [AK9]: What is the definition of Self Efficacy?

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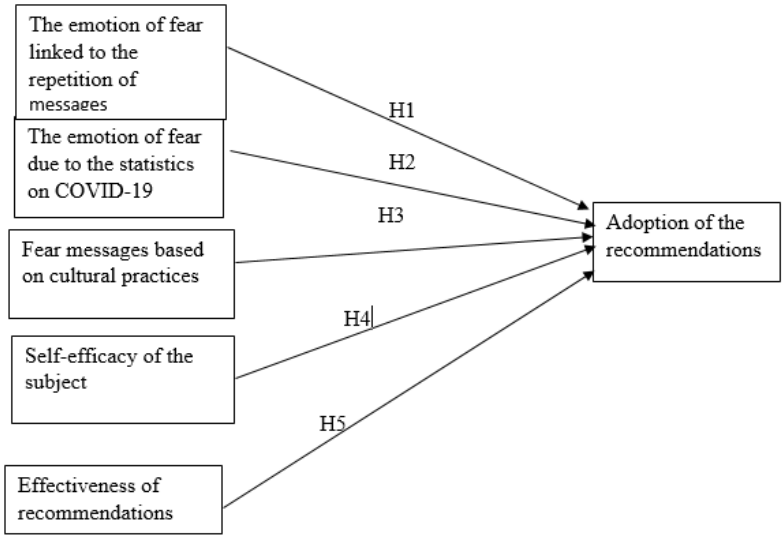
Figure 1: Conceptual model of the research



3. DATA AND METHODOLOGY

3.1 Sampling, data collection and analysis

As no one is immune to this disease, the selection criterion for the sample was the possession of a cell phone and a Whatsapp number or a Facebook account. Due to social distancing and especially the recommended barrier measures for this pandemic, it was almost impossible to administer the questionnaire face to face. The questionnaire was administered throughout the month of October 2020. We opted for online questionnaires via google forms, which allowed us to reach people from all regions of Cameroon. In fact, the principles of the snowball sampling method were applied: We sent the questionnaire beforehand to our contacts, telling them to forward it to anyone aged 18 or older in their directory. All they had to do was click on the link indicated to open, fill in and return the questionnaire. We obtained 290 questionnaires, 286 of which were usable. We had activated the "mandatory" option on all questions to limit non-responses. SPSS 21 and Amos software were used to process the data obtained. The causal model of this research legitimizes the use of structural equations to test the impact between the different constructs studied.

Comment [AK11]: Difficult to understand the ethical implications of this method since no consent was obtained and individuals were not clearly informed of the purpose of the study.

The structure of the sample is composed of 58.7% men and 41.3% women. 67.8% are between 18 and 35 years old, 21.3% between 36 and 45 years old and 10.8% are over 46 years old. As for religion, 88.8% are Christians, 5.9% are Muslims and 5.2% belong to other religions. 50% have a monthly income of less than 100,000 FCFA (about 153 Euros). 24.1% have an income between 100,000 and 300,000 CFA francs and 25.1% have more than 300,000 CFA francs (458 Euros).

3.2 variable measurement

The three-point Likert scale (1= Agree, 2 = Neutral, 3 = Disagree) was preferred for all variable measurement items. With the use of smartphones, this simplified number of points makes it easier to read the different modalities.

The emotion of fear generated by the forms of fear activation is evaluated using five items from the study of Gallopel and Valette-Florence (2002): "frightens me, tense, nervous, anxious, and uncomfortable"

The behavior promoted in the fight against COVID-19 is the application of "barrier measures". We selected seven of them corresponding to the measurement items of this variable. This approach was inspired by Gallopel's (2005) work on smoking prevention.

Witte (1992) provided several items on the effectiveness of recommendations and self-efficacy in AIDS prevention. Following this logic, we formulated seven items for each of the two constructs, incorporating barrier measures against COVID-19. The set of measurement items is given in Table 1 in the Appendix.

3.3. Reliability of measurement instruments

Through exploratory factor analysis, we relied on four commonly used tools to assess the reliability of the instruments used. These include Cronbach's alpha, the KMO index, Bartlett's test of sphericity and the percentage of total variance explained. Subsequently, confirmatory factor analysis was used to test the convergent and discriminant validity of each construct. The Joresco rho was calculated. The table below summarizes the measurement properties of the variables.

Table 1: Reliability of the measurement instruments

Variables	***Number of items***	**Cronbach's α**	**KMO Index**	**Bartlett's Sphericity Test**	**Variance Explained**
Behavior adoption	6	**0.875**	0.832	0.000	62.289
The emotion of fear due to message repetition	3	**0.766**	0.728	0.000	68.426
The emotion of fear due to statistics on COVID-19	3	**0.831**	0.721	0.000	74.931
Fear messages based on cultural practices	3	**0.771**	0.705	0.000	68.594
Effectiveness of recommendations	5	**0.867**	0.846	0.000	65.579

Subject self-efficacy	5	**0.667**	0.709	0.000	64.650

Source: the authors

From the data in this table, we can conclude that all our measurement instruments have good reliability. All Cronbach's α coefficients and KMO indices are above or close to the required threshold of 0.7; Bartlett's test of sphericity is significant at the 1% level for all variables; and the percentages of variance explained are above 60%.

We also performed confirmatory factor analyses by determining Jöreskog's Rho and Convergent Validity Rho (CVP). Table 2 below presents the results of these analyses:

Table 2: Results of confirmatory analyses

Variable	Adoption of recommendations	Repeat messages	*Statistics COVID-19*	Government measures	Efficiency	Self-efficacy
Jöreskog rho	***0.887***	***0.831***	***0.863***	***0.824***	***0.898***	***0.742***
Convergent Validity Rhythm (CVP)	***0.666***	***0.627***	***0.679***	***0.610***	***0.691***	***0.521***

The information in this table shows satisfactory results for each of the dimensions of the measurement model. Indeed, the values of the Jöreskog Rhô exceed the minimum threshold of 0.7 and those of the PVC are higher than 0.05. Overall, the measurement instruments demonstrate the good psychometric properties of the scales selected.

4. RESULTS AND DISCSSION

4.1. Appreciation of the measures enacted by the government for the management of people who died as a result of COVID-19

As part of the government's response to limit cases of contamination, several measures were considered. The opinions of individuals regarding the measures enacted by the government for the management of COVID-19 decedents are summarized in the table below:

Table 3: Summary of individuals' opinions regarding the measures enacted

Mesures	Agree		Neutral		Disagree	
	Number	%	Number	%	Number	%
1. Burial of your loved ones within 48 hours of death from Covid-19	126	44.1	41	14.3	119	41.6
2. Burial in the area of death	78	27.3	55	19.2	153	53.5
3. Burial of your loved ones by strangers (medical corps)	81	28.3	51	17.8	154	53.8
4. Burial away from home village	67	23.4	59	20.6	160	55.9
5. Preventing a family from taking the	89	31.1	45	15.7	152	53.1

body of the deceased						
6. Burial without final tribute from family or relatives	55	19.2	53	18.5	178	62.2
7. Limiting the number of people at the funeral of a loved one	164	57.3	40	14.0	82	28.7

It is clear from this table that almost all the measures taken by the government regarding the management of deceased persons are not appreciated by more than half of the respondents. This could reflect the degree of adherence of the population to their customs and practices. In fact, post-mortem activities seem to be important to them. They attach importance to the place of burial and to funeral ceremonies.

4.2 Results of hypothesis testing

The goodness of fit of the structural model was tested by examining the absolute, incremental, and parsimony indices presented in the table below.

Table 4: Structural model fit indices

Index Types		Values	Empirical acceptance thresholds
Absolute indices	RMR : *Root-Mean-square Residual*	0.036	Values less than 0.05
	RMSEA : *Root-mean-square error of approximation*	0.058	Values less than 0.08
Incremental indices	CFI : *Comparative Fit Index*	0.906	Values greater than 0.9
	IFI : *Incremental fit Index*	0.908	
Parsimony index	Khi-deux normé (*Khi-deux/ddl*)	1.952	Values greater than 3

The analysis of the fit indices presented in the table above allows us to conclude that our theoretical model fits the empirical data well. Indeed, all the values of our indices respect the prescribed validation standards. Given this state of the structural model, the next step is to provide the results of the hypothesis tests. Figure 2 below summarizes the estimated model under Amos.

Figure 2: Results of hypothesis testing[1]

[1] Repmes: repetition of messages; Mesgvt: fear messages based on cultural practices; Statgvt: government statistics on COVID-19; Aueff: self-efficacy; Effrod: effectiveness of recommendations ; Adop: adoption of behaviour

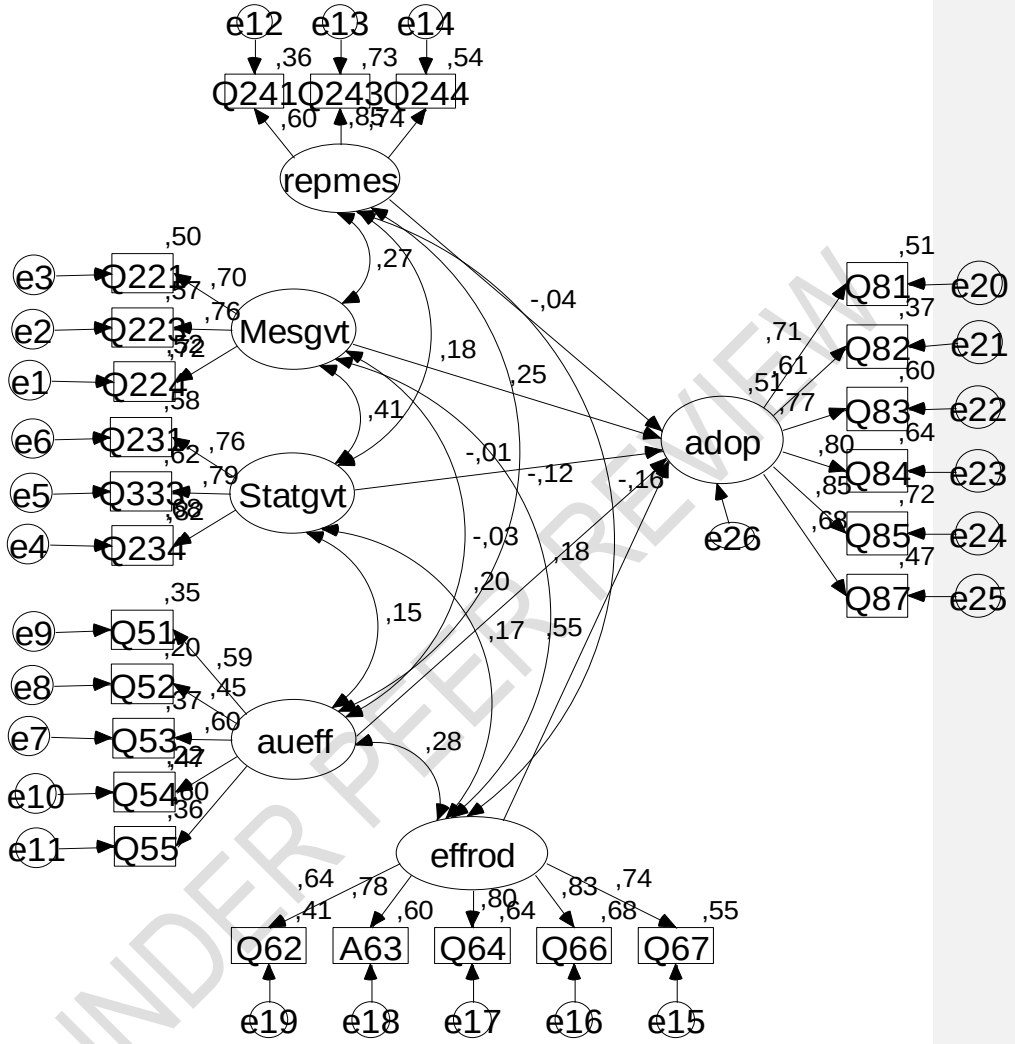


Table 5: Causal Relationship Results and Research Hypotheses

Causality Regression Coefficient	Regression Coefficient (Beta)	C,R	Statistical Significance

H1: Fear emotion due to message repetition promotes the adoption of barrier measures against COVID-19.	0,061	-0.710	0.477
H2: Fear emotion due to COVID-19 statistics positively influences adoption of barrier measures.	0.047	-0.166	0.868
H3: Fear messages based on cultural practices promote adoption of barrier measures against COVID-19.	0.217	3.540	0.000
H4: Subject self-efficacy positively influences adoption of COVID-19 recommendations.	0.089	2.880	0.004
H5: The more effective the recommendations are, the more individuals adopt them in the framework of COVID – 19.	0,063	7.425	0.000

Figure (2) and Table (5) above display the results of the tests performed on the previously formulated hypotheses. These results allow us to test the significance and importance of causal relationships between several variables and the adoption of recommendations for the control of COVID-19. The observation of this figure, as well as the reading of this table, show that the betas are all positive but not all significant. Contrary to our expectations, the effect of repeated messages and government statistics on the adoption of barrier measures, while positive, is not significant. The Beta coefficients are respectively (0.061 and 0.047) and the probabilities (0.477 and 0.868 > 0.001). These data contradict hypotheses H1 and H2. On the other hand, the coefficients on three variables are positive and significant. In particular, the government messages relating to cultural practices (Beta = 0.217; P = 0.000); the self-efficacy of the subject (Beta = 0.089; P = 0.004) and the effectiveness of the recommendations (Beta = 0.063; P = 0.000), hence the validation of the related hypotheses. These results are consistent with Witte and Allen's (2000) research findings that self-efficacy and recommendations are the most influential variables on persuasion compared to threat.

4.3 Discussion of the results and contributions of the research

Overall, the objective of this research was to determine, by using fear, the variables on which we could rely to optimize the prevention of COVID-19. This ambition led us to several conclusions. First, the effect of message repetition on the adoption of barrier measures was rejected. Yet, Courbet (2003) has previously demonstrated the effectiveness of the variable repetition of fear messages. The same is true for Yang et al. (2020) who believe that repetition guarantees the effectiveness of the response in a COVID-19 situation. Similarly, Chappé et al. (2007) found that message repetition reinforces behavioral intention, and suggested that more positively framed prevention messages should be presented to increase their effectiveness. This insignificant result could be explained by the fact that, in Cameroon, awareness-raising on any subject is usually done in a repetitive manner, and this habit unfortunately decreases the interest of the latter in the relevance of the subject. By dint of regularly listening to the same message, the subjects end up not paying the necessary attention to the message conveyed.

Subsequently, the hypothesis of the positive effect of government statistics on recommendation adoption was also not validated. Although Levy-Leboyer and Moser (1977) concluded that the ability of fear to persuade was also a function of variables such as the style of the message (numbers, statistics images...), we attribute the failure of this result to postulated hypothesis to several reasons: The first could be related to the source of the message. The reach of a fear message depends on the source of information. According to Okuhara et al. (2020), the experiment done in COVID-19 shows that recommendations from a doctor increase more significantly the intention to stay at home than those from a governor, an expert or a resident. The second reason would be trust in the sender of the message. Indeed, Fox and Duggan (2013) believe that distrust may affect the public's receptivity and reactions to public health information since clinicians are a trusted resource for information about serious health problems and support. In addition, pre-pandemic studies have also claimed that when institutional trust is high in the population, citizens tend to conform to institutional norms and guidelines (Letki, 2006) by, for example, following the instructions and recommendations of health authorities. Given the biases often contained in government information for the sake of the public good or otherwise, individuals tend not to believe the statistics disseminated by these sources.

Furthermore, we were able to confirm the positive effect of fear messages based on cultural practices on the adoption of VCT-19 recommendations. Our results go against the findings of authors such as Goggin et al. (2007) for whom beliefs constitute a brake on the intention to engage in risky health behaviors. However, we note that these authors do not specify the nature of the beliefs. We believe that when individuals are attached to their cultural practices, as is the case in Africa, messages that infringe on their habits could lead them to adopt the recommendations. This is especially true since the fear of not benefiting from cultural rites is quite high. This result sheds new light on a new direction for fear messages in social marketing.

Comment [AK12]: I could not find how this confirmation came about . In addition the conclusions here are based more on belief (sentence 5 of the paragraph) "We believe that when individuals….". The validity of the findings are not based on science but on the belief of the authors.

We also confirmed the positive effect of referral efficacy and subject self-efficacy on the adoption of COVID-19 control measures. These results are broadly consistent with previous work (Block & Keller, 1997; Witte & Allen, 2000) that has shown the prominence of these variables in a fear-based prevention campaign. However, they are at odds with the results of Yang et al. (2020) on COVID-19. According to the latter, the perceived threat of the pandemic is so high that the perceived effectiveness becomes insignificant in influencing behavioral intention.

4.4 Recommendations, Limitations and Future Research

In light of the results obtained, we recommend that persuasive communication actors, and especially members of the government, further popularize fear messages based on cultural practices. Also, traditional and religious authorities should be used as intermediaries to raise awareness about the adoption of barrier measures in their communities (outreach communication). Health care workers should also be involved in persuasive communication about the adoption of barrier measures.

To improve the effectiveness of fear messages, it would be relevant to identify variables other than statistics and repetition that may influence the persuasiveness of the message.

For example, civil society could emphasize victim testimonies and shocking images to increase awareness. However, there are a few limitations to the scope of the results. The first limitation of this study relates to the data collection method. Indeed, this study relied on an empirical sampling method (snowballing). The study should be replicated by administering the questionnaire following a random survey. This could be done by using the databases of cell phone operators as a sampling frame.

Also, this work is based on an online questionnaire and not face to face. Despite the pre-testing, it is possible that some respondents may not have understood the questions. Thus, despite the reliability and validity of the results obtained, the study should be replicated using a face-to-face questionnaire. Furthermore, this research did not focus on the moderating and mediating processes of the different variables. Finally, the fear emotion used did not incorporate the different levels of fear, which are important dimensions in the evaluation of fear messages. Future work could therefore question the different levels of fear and the relevance of socio-demographic variables (gender, age, etc.) as mediating and moderating variables.

COMPETING INTERESTS

Ethical standards. The Author declare that this research article complies with the ethical standard of this journal.

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APPENDIX

Table 6: Items used to measure the study variables

Variables	**Items**	Reliability **(α)**
Behavior adoption	- I keep my distance from people when I leave my house - I stay at home and only go out when necessary - I follow the containment rules that the government has mandated to combat COVID-19 - I wear my mask regularly when I leave my home - I regularly wash my hands with soap and clean running water or a hydroalcoholic solution - I cough into my elbow	**0.875**
Repetition of messages	- Scares me - Makes me nervous - Makes me anxious	**0.766**
Statistics on COVID-19	- Scares me - Makes me nervous - Makes me anxious	**0.831**
Fear messages based on cultural practices	- Scares me - Makes me nervous - Makes me anxious	**0.771**
Effectiveness of recommendations	-It is necessary to stay at home and only go outside if absolutely necessary -Wearing a mask is an effective solution -Regular hand washing with soap and clean running water or hydro-alcoholic gel is effective in protecting against COVID-19 -Avoiding touching the eyes, nose and mouth protects against COVID-19 -Coughing into the elbow protects against COVID-19	**0.867**
Subject self-efficacy	-I feel able to sneeze into my elbow - Wearing a mask is not a problem for me -I have no difficulty washing my hands regularly	**0.703**