Original article

Perception of exaggeration or fear propagated by the media among the Peruvian population during the COVID-19 pandemic

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ABSTRACT

Introduction: In global health crises the media is important for reporting on important issues to the population.

Objective: To characterize and find associations of perceived fear or exaggeration conveyed by the media in the COVID-19 pandemic.

Methods: Analytical and multicenter cross-sectional study. A virtual survey was conducted among 4009 people, in 17 cities of Peru, from March 15-20, 2020. The instrument, previously validated, evaluated three factors: the exaggeration of the media; the fear generated and the communication coming from health personnel, family members and friends. Relationship coefficients and p-values were calculated through the use of generalized linear models, with Gaussian family and identity linkage function. Values of $p < 0.05$ were considered statistically significant.

Results: Social networks (64%) and television (57%) were perceived by all participants as exaggerating information; also, television (43%) and social networks (41%) increased the perception of fear. As for their family/friends, they perceived that they exaggerated the situation (39%) and generated fear (25%). In the multivariate analysis, women ($p<0.001$), those who had completed high school ($p=0.023$), were university students ($p=0.037$) and those with a postgraduate degree ($p=0.002$) had a lower total score of fear and perception of exaggeration.

Conclusions: The perception of exaggeration and fear generation in the population were mostly caused by television and social networks.

Keywords: Coronavirus, pandemic, social media, fear, Peru.

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Introduction

The mass media become the main source of information for citizens and they have an obligation to provide reliable and trustworthy information.[1] Media can play an important role in sending public health messages around the world and piquing communities' interest.[2] On several occasions, adequate media information has helped international organizations, such as the World Health Organization, to ensure that each person at risk is able to make informed decisions and mitigate the effects/threats during various pandemics.[3]

However, some media have been reported to have negative effects on the health of the population, such as what happened in Brazil in 2018 during the yellow fever vaccination campaign. Rumors on social networks that the vaccines could kill, worked against achieving the vaccination goal, reducing the reach from 95% to 76%.[4] Also, during the AH1N1 influenza pandemic, misconceptions about the mode of transmission and preventive measures precipitated the onset of the peak phases, thus highlighting the harm of media misinformation.[5] Chew C. et.al. describe that, among the media, the social network Twitter is the main source consulted by the public,[6] so misinformation on it can be quite dangerous. This was most evident with the report of the death of two people in Nigeria, after consuming large amounts of salt water to protect themselves from Ebola, after seeing a social media post.[7]

The coronavirus disease (COVID-19) pandemic is a global health emergency and many countries are currently affected, with thousands of deaths and a major economic impact. [8,9] In this context, the media should inform the population appropriately and provide data that will enable appropriate decisions to be taken, through the veracity and quality of the information they provide.[10] Good use of the media can help to understand and implement drastic health measures, such as quarantine. This is evidenced by the high acceptance (>95%) that the Peruvian population has of the government's health policies, which included social isolation and curfews. According to a survey conducted at the national urban level,

16% of people report feelings of fear.[11] In this sense, it is important to evaluate the exaggerated information and, in the worst case, false information that circulates through social networks and is disseminated by the media. This is why effective communication and adequate risk communication are necessary.[12] The objective of the research was to characterize and find associations of the perception of fear or exaggeration disseminated by the media during the COVID-19 pandemic in a population not yet studied—the Peruvian population.

Methods

Studio design

An observational, cross-sectional, analytical, and multicenter study was conducted between March 15 to 20, 2020.

Population and sample

The study includes 4,009 surveys, conducted virtually in the most important cities of Peru: Arequipa, Ayacucho, Cajamarca, Cerro de Pasco, Chiclayo, Chimbote, Cusco, Huancayo, Huánuco, Ica, Iquitos, Lima, Piura, Pucallpa, Puno, Tacna y Trujillo.

People who answered the virtual survey voluntarily, in a complete and appropriate manner (no patterns or anomalous responses), were included. We excluded 323 surveys for being incomplete (not having one or more of the media perception responses) and 193 for being taken by minors.

A non-randomized sampling was conducted, which led to a snowball type sampling, where each respondent requested the participation of their family, friends, fellow students and acquaintances, so that they could share it with other people at the same time.

Variables and tools

The survey consisted of 12 questions to measure the perception of the media, which was previously validated in the following phases. First, a bibliographic search was conducted with scientific articles and other sources of grey literature. In the absence of instruments that fit our reality, we decided to propose our own; the first measurement instrument was constructed with 13 items with answers in a Likert type scale (from very much in agreement to very much in disagreement). Later, an expert judgment was carried out for validation, with 30 experts from different specialties (infectious diseases experts, epidemiologists,

health professionals, internists, nurses, and psychologists). Then a pilot survey was conducted with more than 380 people in 17 cities of Peru. Finally, a statistical validation of the survey was carried out, where three factors were found, all with adequate statistical and validity measures.

Post-survey implementation, the Cronbach's global alpha (0.92) was measured as well as the Cronbach's alpha for each of the three factors. Exaggeration of means (items 2, 4, 6, and 8 of the survey), with alpha of 0.90; generated fear (items 1, 3, 5, and 7 of the survey), with alpha of 0.92; and communication of health personnel, family, and friends (items 9, 10, 11, and 12 of the survey), with alpha of 0.84. These were contained in the survey and were adjusted for the variables of sex, age, and educational level.

Procedure

After the development of the project and the pilot, the survey was conducted using a Google Drive sheet. The privacy of the respondents was respected at all times, in the interest of preserving their anonymity in the research. Also, at the beginning of the survey, it was mentioned that the overall results would be published in a scientific journal and that by filling out the survey, the participants understood that they were giving their consent. Later, a spreadsheet was generated in the Microsoft Excel program (version for Windows 2019), where at first manual debugging was performed and then the information was passed to a database in the Stata v.11.1 statistical program (StataCorp LP, College Station, TX, USA), where a second quality control was performed.

Statistical analysis

The analysis was done in three phases. In the first phase, the descriptive analysis of the variables was done, for which the frequencies/percentages for the categorical variables and the median/interquartile range for the numerical variables were calculated (after evaluating the normality of the variables, by means of Shapiro Wilk's statistical test). In the second phase, a bivariate statistic was used, where the perception of each of the items was crossed according to the main characteristics. Finally, an analytical statistic was used, where each one of the 12 items was measured, according to the measured socio-demographic variables. This was done with the test of generalized linear models, with the Gaussian family, identity linkage function, and robust models. The adjusted coefficients, 95% confidence intervals

(CI 95%) and *p* values were obtained. It was considered statistically significant when a *p* value of less than 0.05 was obtained.

Results

Of the 4,009 properly completed surveys, 54.3% (2166) were answered by women. The median age of respondents was 23 years (interquartile range 20–28 years). Depending on the level of education, most reported undergraduate studies (67%), followed by technical studies and graduate studies (both 8% each). With respect to the perceived exaggeration of the magnitude of the situation (Fig. 1), people perceived that the media that exaggerated the most were social networks (26% strongly agreed and 38% agreed), followed by television (21% strongly agreed and 36% agreed), and newspapers/magazines (17% strongly agreed and 35% agreed).

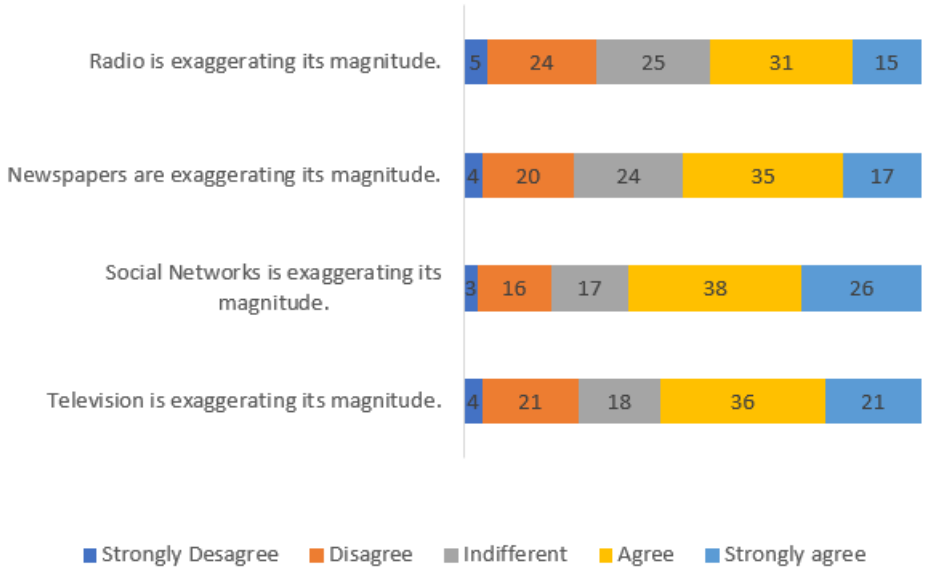

Fig. 1 - Perception of the Peruvian population about the exaggeration of the media regarding COVID-19

Regarding the perception of fear generated by the situation (Fig. 2), people perceived that the media most conducive to such fear were television (15% strongly agreed and 28% agreed), followed by social networks (16% strongly agreed and 25% agreed) and newspapers/magazines (12% strongly agreed and 24% agreed).

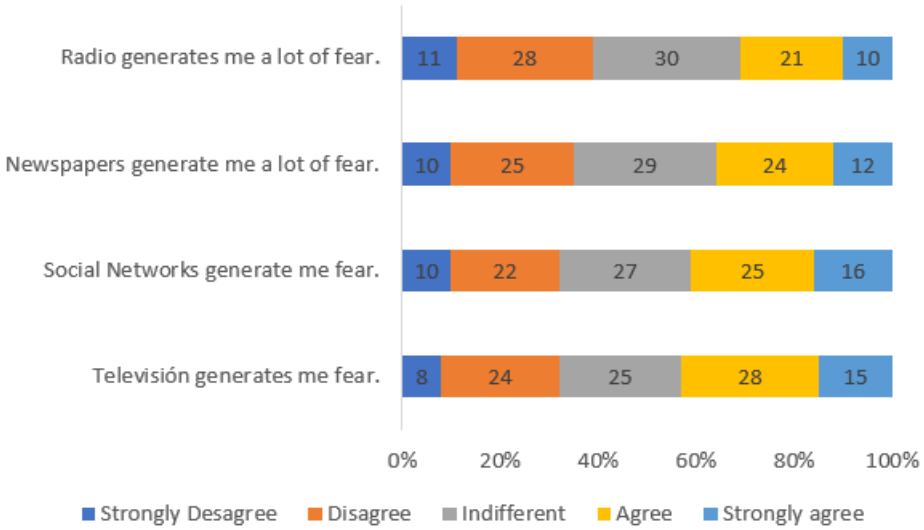

Fig. 2 - Perception of the Peruvian population about the fear generated by the media regarding COVID-19

With regard to the perception of the communication coming from the health sector or their friends/family (Fig. 3), people perceived that family/friends greatly exaggerated the situation (13% strongly agreed and 26% agreed) and generated a lot of fear in them (8% strongly agreed and 17% agreed).

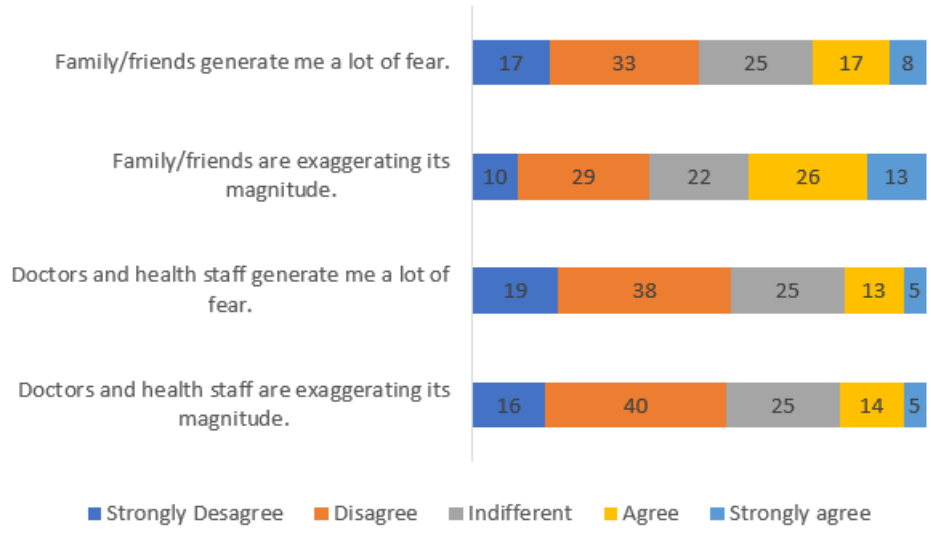

Fig. 3 - Perception of the Peruvian population about the communication of health, family, and friends regarding COVID-19

In the multivariate analysis (Table 1), it was found that, women (Coefficient: 0.28; CI 95%: 0.15–0.53; *p* value<0.001), those who had secondary education (Coefficient: 0.05; CI 95%: 0.01–0.67; *p* value=0.023), with a university degree (Coefficient: 0.07; CI 95%: 0.01–0.85; *p* value=0.037), and with a postgraduate degree (Coefficient: 0.02; CI 95%: 0.01–0.24; *p* value=0.002) had a lower total score, adjusted for age. Regarding the total score of the exaggeration disseminated by the media, it was women who perceived that there was less exaggeration (Coefficient: 0.49; CI 95%: 0.38–0.62; *p* value<0.001), adjusted for age and education.

Table 1 - Multivariate analysis of factors associated with the sum total and exaggeration factor that may be disseminated by the media during the COVID-19 pandemic

Variable	Total score of the questions	Exaggeration score
Female gender	0.28 (0.15-0.53) <0.001	0.49 (0.38-0.62) <0.001
Age (years)	Not significant	Not significant
Academic degree		
None or primary	This category served as a comparison for the other categories of instruction	
High school	0.05 (0.01-0.67) 0.023	Not significant
Technical	Not significant	Not significant
University students	0.07 (0.01-0.85) 0.037	Not significant
Postgraduate	0.02 (0.01-0.24) 0.002	0.30 (0.11-0.86) 0.025

Note: The age variable was analyzed in its quantitative form. The coefficients (the 95% confidence intervals) and *p* values were obtained through generalized linear models, with the Gaussian family, identity-binding function, and robust variance models.

In relation to the total score of fear generated by the media (Table 2), the older the respondents, the greater the perception of fear generated by the information sources (Coefficient: 1.018; CI 95%: 1.005–1.032; *p* value=0.008), adjusted for sex and educational level. Women (Coefficient: 0.50; CI 95%: 0.39–0.63; *p* value<0.001), those with secondary

education (Coefficient: 0.27; CI 95%: 0.09–0.79; *p* value=0.017), with a university degree (Coefficient: 0.28; CI 95%: 0.10–0.78; *p* value=0.078) or with a postgraduate degree (Coefficient: 0.17; CI 95%: 0.06–0.50; *p* value=0.001) had a lower communication score of exaggeration and fear from health personnel and friends/family, adjusted for age.

Table 2 - Multivariate analysis of factors associated with the sum of fear and communication coming from health personnel and friends/family in the COVID-19 pandemic

Variable	Total Fear Score	Direct Communication Score
Female gender	Not significant	0.50 (0.39-0.63) <0.001
Age (years)	1.018 (1.005-1.032) 0.008	Not significant
Academic degree		
None or primary	This category served as a comparison for the other categories of instruction	
High school	Not significant	0.27 (0.09-0.79) 0.017
Technical	Not significant	Not significant
University students	Not significant	0.28 (0.10-0.78) 0.015
Postgraduate	Not significant	0.17 (0.06-0.50) 0.001

Discussion

It was found that exaggeration and fear were perceived more in social networks and television. At present, television is the most important medium for the transmission of information [13,14] and social networks are becoming the preferred means of receiving information.[15] Television is so important that the time spent in front of it is used as a health indicator [16] or a dissemination strategy to spread knowledge and prevent diseases.[17,18] Social networks, on the other hand, can have a negative or positive influence on people, and can cause or exacerbate anxiety and/or depression.[19,20]

Our results coincide with those reported in a population of university students in Colombia, where, by means of inquiries, we studied the perception of fear with respect to issues of

climate change and social security, and its association with the media as a trigger. Here the factors that trigger fear were classified into four levels—fear of disease being at the third level, which was underestimated by the Colombian youth population. [21]

Silvia Barei, in her work, states that the media can be important drivers of the spread of fear, and they are even exploited by some people worldwide.[22] It is also known that the information they disseminate may be biased, which would provoke fear in the case of certain infectious diseases.[23] This can even occur in other emergency situations, such as in the context of drug trafficking, where they can also be the main propagators of fear. [24]

In the current COVID-19 crisis, not only did the virus spread rapidly, but the misinformation about the outbreak generated panic among the public and even a lot of inaccurate/erroneous information became virulent.[25] To combat this misinformation, geographic information systems were developed, such as the Johns Hopkins University Center for Science and Systems Engineering (JHU CSSE) dashboard, the WHO ArcGIS Operations Panel for COVID-19, among others. [26]

A study carried out in China on the psychological impact of COVID-19 on the population, under similar conditions to ours (in quarantine and through virtual surveys, using the snowball method to reach a greater number of respondents), obtained the following results. The medium most used to gain information about this disease was the Internet, and the information provided was perceived to be satisfactory. In our study, the majority of the population surveyed reported that social networks exaggerate information, which differs from what was found in the Asian population. People in this study reported less fear after receiving information from health personnel. In the case of China, people who perceived that their family doctors were not trained to diagnose or recognize COVID-19, developed stress, anxiety, and depression. [27]

Among the other sources of communication, it was found that family members and friends were the ones who exaggerated the most and spread fear among the respondents, compared to health personnel, who had low percentages of these two perceptions. This can be explained by the fact that family and friends are often the closest people, and if they are misinformed or unaware of the situation, they can generate misinformation, which can be further replicated by word of mouth. In contrast, families can play an important supportive role, both emotionally and socially, which is indispensable while coping with adversity.[28]

Thus, in the case of people infected with HIV/AIDS, it has been seen that living with a person who reinforces negative stereotypes with regard to their disease, increases the fear and isolation of the infected people.[29] However, this may be influenced by education, basic

principles, moral, ethical, religious, cultural, political or other conceptions. That is why the individuals today are more informed; however, it is essential that they have digital literacy skills in health.[30,31]

Women had lower perception of different aspects of exaggeration or fear. There are reports stating that women believe that the information provided by media is reliable and true, unlike men,[31] which would explain their lower perception of exaggeration. Interestingly, in our study, the information provided by the media generated more fear in men than in women, while in other studies regarding fear, the results are contrary. For example, in a study conducted in Mexico, on types of fear and their prevalence according to gender, it was shown that in general, women feel more fear than men.[32] A review of fear of media-related crime also found that women are more fearful.[33] These results can be explained by the fact that they are more driven by feelings or emotions, either by the special education or upbringing style they receive in relation to men, this being more noticeable in Muslim cultures.[34] At other times, they are determined to care of their relatives under health risks, as happened in Uganda during the Ebola outbreak.[35]

The fact that women in our country are less afraid may be related to their practice of conducting thorough research while making decisions.[36] For example, a recent Peruvian study showed that women were the most informed when consuming products marked with octagons—which identify high levels of sugar, fat and salt in food products—with men being the most reluctant to understand and use them.[37]

The older the age, the more the fear perceived, which is understandable and even expected, since the older population is at a much greater risk of complications from the disease.[38,39] Possibly this is why the perception of fear is higher, especially if they have comorbidities for possible complications or even a possible fatal outcome, as found in some populations.[40]

On the other hand, studies show that people with a higher academic degree had lesser perceptions of exaggeration and fear.[41] Even if it is perceived that there are alterations in the emission of messages from the media, the interviewees remain calm because of their greater education of hygiene, not affecting their daily life.[42]

The study, carried out in the midst of a health emergency, has some limitations. One of them is the selection bias. Since the study does not have a representative sample, it is not possible to extrapolate the results to the entire Peruvian population. In addition, the instrument did not include variables such as the search for information to make decisions and self-medication, which should be studied in future. However, due to the size of the sample (more

than 4,000 people) and the diversity of the regions included in this project, we consider that the results constitute a good approximation of the situation in our country. At the same time, this study does not delve into the rural reality of Peru, since the respondents lived in cities. Therefore, studies that explore the perceptions of the rural population are necessary.

In conclusion, social networks and television were identified as the media that generated the most fear and exaggeration among respondents. Family and friends also contributed in the propagation of erroneous and exaggerated information. Finally, women and those with higher education perceived less exaggeration and fear caused by the media because they considered the information shared by media to be reliable.

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Conflict of interest

The authors declare that they have no conflict of interest.