Fear Perception of the COVID-19 Pandemic in Peru

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ABSTRACT

Introduction: Fear is a natural response to something unknown. In the current scenario, it is important to assess it in relation to the coronavirus disease-19 (COVID-19) pandemic in Latin American countries.

Objective: To determine the fear perception according to factors associated with the COVID-19 pandemic in Peru.

Methods: An analytical cross-sectional study was conducted based on a virtual questionnaire. The main question was “how much fear people had of COVID-19?”, using a scale from zero (without fear) to 10 (very fear). This scale was divided into tertiles, and the upper tertile was the reference category (compared to the middle and lower tertiles). Statistical significances between fear perception of COVID-19 and sociodemographic data were calculated.

Results: A total of 3887 participants responded the questionnaire about fear perception. In the multivariate analysis was found that women (adjusted prevalence ratio (aPR): 1.37; 95% confidence interval (CI): 1.26-1.48; p<0.001), people aged 20-29 (aPR: 1.84; 95% CI: 1.06-1.50; p=0.005), 30-39 (aPR: 1.53; 95% CI: 1.28-1.82; p<0.001), 50-59 (aPR: 1.43; 95% CI: 1.12-1.84; p=0.005), and with 60 or more years (aPR: 1.46; 95% CI: 1.03-2.07; p=0.032), as well as respondents who had some risk for complications due to COVID-19 (aPR: 1.49; 95% CI: 1.32-1.69; p<0.001) were very afraid of the disease. On the other hand, people affiliated with evangelical religions (aPR: 0.79; 95% CI: 0.65-0.96; p=0.018), agnostics (aPR: 0.80; 95% CI: 0.68-0.94; p=0.008), atheists (aPR: 0.67; 95% CI: 0.48-0.95; p=0.024), and health professionals (aPR: 0.81; 95% CI: 0.70-0.93; p=0.003) were less afraid of COVID-19.

Conclusion: There was a notorious fear perception of the COVID-19 pandemic by the Peruvian population. In this context, the fear was associated with important variables. Thus, the provision of further emotional support services for this population should be considered in the face of the current pandemic.

Keywords: fear, perception, COVID-19, pandemic, Peru

INTRODUCTION

Coronavirus disease-19 (COVID-19) has generated a pandemic that has affected almost all countries in the world, being declared a global health emergency [1,2]. This pandemic has had a great impact on the society, as well as it has tested the capacity of the best health systems, including those of France (1st), Italy (2nd), and Spain (7th) [3]. Regarding the situation in Latin America, Brazil, Colombia, and Peru are the countries with the highest number of affected people, respectively. Peru currently ranks sixth among the countries with the largest number of confirmed cases of COVID-19 cases in the world, accounting for more than 800,000 cases of the disease and 32,000 deaths [4].

The current scenario has created several economic and political problems [5], which together with the spread of the disease may cause great fear in the population. In this context, it is worth mentioning that in the last 30 years at least 30 infectious diseases have appeared, with different etiologies and forms of transmission [6]. Among these diseases, we highlight the novel 2009 influenza A (H1N1) (2009), severe acute respiratory syndrome (SARS) (2002), and Middle East respiratory syndrome (MERS) (2012) [7]; however, the situation due to COVID-19 has been more catastrophic than in all of them [8].
The emergence of fear has been reported in serious epidemic, such as Ebola, period when the population was so anxious to the point of people accepting to use unauthorized or experimental drugs [9]. On the other hand, it is worth remembering that the same did not happen in the H1N1 post-pandemic period, in which restrictive measures were accomplished only by people with respiratory diseases or chronic diseases that affect the immune system while the rest of the population did not fully comply with these recommendations and did not even perceive risks of transmission to their family members [10].

At present, the COVID-19 emergency is leading to serious health problems, including stress, anxiety, depressive symptoms, and fear [11,12]. Mental health issue during the pandemic has been addressed by several studies with the main objective of verifying the impact on people’s emotional state in order to prepare appropriate interventions [13-15]. To understand the psychological and psychiatric impacts of a pandemic, the emotions involved in it, such as fear, must be considered and observed [16]. For all these reasons, it should be important to measure the fear generated by this pandemic in the population. Therefore, the objective of this research study is to determine the fear perception according to factors associated with the COVID-19 pandemic in Peru.

METHODS

Study Design

This is an analytical and multicenter cross-sectional study conducted in 20 cities of 17 departments in Peru: Arequipa, Ayacucho, Cajamarca, Cercos de Pasco, Chiclayo, Chimbote, Cusco, Huancayo, Huánuco, Ica, Iquitos, Lima, Piura, Pucallpa, Puno, Tacna, and Trujillo. It should be noted that they correspond to the largest and most important cities and departments in the country. Thus, this investigation included a wide sample, which represents different characteristics of the Peruvian population.

Population and Sample

In this research, we include people residing in some of the cities mentioned above, who showed interest in participating in the study and who had or had not comorbidities related to complications of COVID-19 (such as, being elderly, cancer patient, or with any hypertensive disease). A total of 596 participants were excluded from the study, given that they did not answer the main question (about fear perception), or they had different nationality and/or were minors.

The type of sampling was non-probabilistic aiming to maintain the homogeneity in each of the locations of the study. An initial calculation of a minimum of 2867 respondents was performed to find a minimum percentage difference of 4% (statistical significance p<0.05) were calculated. After that, we performed a quality control of the data and those that did not meet the selection criteria were excluded. Thereafter, the data were encoded and tabulated in a Microsoft Excel spreadsheet (Microsoft, Redmond, CA, USA). A second filtering of the information and the quality control for each study site were also performed using the spreadsheet. After that, the data was exported to the STATA version 11.1 (StataCorp, College Station, TX). Research ethics were carefully considered, and ethical approval was granted before data collection. Moreover, all respondents were previously informed about the purpose and the objectives of the research and their participation was voluntary for the study.

Data Analysis

A table of frequencies and percentages of the crossing between the three levels of fear intensity and the other variables were created. In this case, statistical significances were calculated with Chi-square test. Tables of the bivariate and multivariate models were constructed using generalized linear models, with the Poisson distribution and a logarithmic link function, and models for robust variance adjusted according to the city of respondents. Crude and adjusted prevalence ratios (aPR), 95% confidence interval (CI), and p-values (statistical significance p<0.05) were calculated.

RESULTS

A total of 3887 participants were divided into tertiles according to their perceived fear. 1275 (32.8%) had little fear, 1277 (32.8%) had moderate fear, and 1335 (34.4%) a lot of fear. The considered sociodemographic data were gender (male or female), degree of education (up to secondary education or technical/higher education), age (18-19 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years, and 60 years or older), religion (catholic, evangelical, christian, adventist, Jehovah’s witness, latter-days, mormon, buddhist, other religions, agnostics, and atheists), the city of respondents (according to the cities previously mentioned), and type of respondent (without risk of complications due to COVID-19 - without comorbidities, with risk of complications due to COVID-19, healthcare staff, and healthcare staff considered at risk).

Procedures and Ethics

An electronic version of the questionnaire was sent to the participants through creation of a form using Google Drive. After that, we performed a quality control of the data and those that did not meet the selection criteria were excluded. Thereafter, the data were encoded and tabulated in a Microsoft Excel spreadsheet (Microsoft, Redmond, CA, USA). A second filtering of the information and the quality control for each study site were also performed using the spreadsheet. After that, the data was exported to the STATA version 11.1 (StataCorp, College Station, TX). Research ethics were carefully considered, and ethical approval was granted before data collection. Moreover, all respondents were previously informed about the purpose and the objectives of the research and their participation was voluntary for the study.

Variables and Assessment Tools

The main variable of the study was the fear perceived by the participants related to COVID-19, which was obtained in a quantitative form, using a scale from zero (indicating "not afraid") to 10 (indicating "very afraid"). After completion of data collection, the studied population was divided into tertiles according to the obtained scores (Tertile of least fear perception - composed by people who had a score of 0-3 points in the questionnaire; Middle tertile- composed by people who had a score of 4-5 points; Tertile of highest fear perception- composed by people who had a score of 6-10 points). The variable was also dichotomized into two categories: with a lot of fear (6-10 points) or with little fear (0-5 points).

The considered sociodemographic data were gender (male or female), degree of education (up to secondary education or technical/higher education), age (18-19 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years, and 60 years or older), religion (catholic, evangelical, christian, adventist, Jehovah’s witness, latter-days, mormon, buddhist, other religions, agnostics, and atheists), the city of respondents (according to the cities previously mentioned), and type of respondent (without risk of complications due to COVID-19 - without comorbidities, with risk of complications due to COVID-19, healthcare staff, and healthcare staff considered at risk).

To prepare appropriate interventions [13-15]. To understand the psychological and psychiatric impacts of a pandemic, the emotions involved in it, such as fear, must be considered and observed [16]. For all these reasons, it should be important to measure the fear generated by this pandemic in the population. Therefore, the objective of this research study is to determine the fear perception according to factors associated with the COVID-19 pandemic in Peru.
Religion

Education level

Age categorized

Type of respondent

Table 1. Fear perception according to socio-educational characteristics before the COVID-19 pandemic in Peru

| Variables       | Fear perception | p-value |
|-----------------|-----------------|---------|
|                | Little          | Moderate | A lot    |
| Sex            | Male            | 688 (40.1%) | 543 (31.7%) | 484 (28.2%) | <0.001 |
|                | Female          | 575 (26.7%) | 730 (33.9%) | 848 (39.4%) |
| Age categorized | 16-19 years old | 202 (34.6%) | 223 (38.3%) | 158 (27.1%) | <0.001 |
|                | 20-29 years old | 819 (33.4%) | 805 (32.9%) | 825 (33.7%) |
|                | 30-39 years old | 118 (31.1%) | 105 (27.7%) | 156 (41.2%) |
|                | 40-49 years old | 59 (29.8%) | 69 (34.9%) | 70 (35.3%) |
|                | 50-59 years old | 37 (23.0%) | 54 (33.5%) | 70 (43.5%) |
|                | 60 years or older | 27 (30.0%) | 14 (15.6%) | 49 (54.4%) |

Note: p-values were obtained with Chi-square test.

Table 2. Bivariate analysis of the factors associated with being very afraid of the COVID-19 pandemic in Peru

| Variables                        | Prevalence ratio | 95% Confidence intervals | p-values |
|----------------------------------|------------------|---------------------------|----------|
| Female                           | 1.39             | 1.28-1.51                 | <0.001   |
| Primary or secondary education   | 0.97             | 0.84-1.14                 | 0.797    |
| Age categorized                  |                  |                           |          |
| 18-19 years old                  |                  |                           |          |
| 20-29 years old                  | 1.24             | 1.04-1.47                 | 0.018    |
| 30-39 years old                  | 1.52             | 1.27-1.81                 | <0.001   |
| 40-49 years old                  | 1.32             | 1.05-1.65                 | 0.014    |
| 50-59 years old                  | 1.61             | 1.25-2.06                 | <0.001   |
| 60 years or older                | 1.98             | 1.98-3.01                 | 0.001    |
| Religion                         |                  |                           |          |
| Catholic                         | 0.77             | 0.64-0.93                 | 0.006    |
| Evangelist                       | 0.71             | 0.58-0.87                 | 0.001    |
| Agnostics                        | 0.62             | 0.44-0.88                 | 0.006    |
| Atheists                         | 0.74             | 0.49-1.10                 | 0.138    |
| Christian                        | 0.70             | 0.39-1.26                 | 0.239    |
| Jehovah’s witness                | 1.59             | 0.69-3.68                 | 0.278    |
| Latter-days                      | 1.22             | 0.82-1.80                 | 0.327    |
| Mormon                           | 1.18             | 0.62-1.70                 | 0.397    |
| Buddhist                         | 0.22             | 0.05-0.95                 | 0.042    |
| Another                          | 0.74             | 0.55-0.99                 | 0.041    |
| Type of respondent               |                  |                           |          |
| No risk                          | 1.60             | 1.36-1.89                 | <0.001   |
| At risk                          | 0.85             | 0.74-0.99                 | 0.032    |
| Health personnel                 | 0.86             | 0.45-1.62                 | 0.632    |

The dependent variable is the perceived fear of the COVID-19 pandemic. This variable was crossed with other variables using generalized linear models (with the Poisson distribution and a logarithmic link function, and models for robust variance adjusted according to the city of respondents).
become more evident in the context of the pandemic due to public health crisis [17]. Furthermore, in most households, the COVID-19 pandemic could be explained taking into account that women present greater subjective distress related to a health risk [18]. In our study, the fact that women were the most fearful of COVID-19 could not only have thoughts about death, but they can also have more frequent thoughts about life after death generated greater anxiety [26].

In the multivariate analysis, we found that women (aPR: 1.37; 95% CI: 1.26-1.48; p<0.001), participants aged 20-29 (aPR: 1.26; 95% CI: 1.06-1.50; p=0.008), 30-39 (aPR: 1.53; 95% CI: 1.28-1.82; p<0.001), 50-59 years old (aPR: 1.43; 95% CI: 1.12-1.84; p=0.005), with 60 years or older (aPR: 1.46; 95% CI: 1.03-2.07; p=0.032), and respondents with some risk for complications (aPR: 1.49; 95% CI: 1.32-1.69; p<0.001) were very afraid of COVID-19. On the other hand, evangelical participants (aPR: 0.79; CI 95%: 0.65-0.96; p=0.018), agnostics (aPR: 0.80; 95% CI: 0.68-0.94; p=0.008), atheists (aPR: 0.67; 95% CI: 0.48-0.95; p=0.024), and healthcare personnel (aPR: 0.81; 95% CI: 0.70-0.93; p=0.003) were less afraid (Table 3).

### DISCUSSION

This cross-sectional study analyzed the association between fear perception of COVID-19 and the sociodemographic data in the Peruvian population. The multivariate analysis showed that women, people aged 20-29, 30-39, 50-59 years, and respondents who had some risk for complications due to COVID-19 had much fear of the disease. On the other hand, people affiliated with evangelical religions, agnostics, atheists, and healthcare personnel had little fear.

In our study, the fact that women were the most fearful of the COVID-19 pandemic could be explained taking into account that women present greater subjective distress related to a public health crisis [17]. Furthermore, in most households, women are the ones who care most for others [18], which may become more evident in the context of the pandemic due to increasing fear. According to the Economic Commission for Latin America and the Caribbean (ECLAC), women do their housework and care for others independently of remuneration [19].

Another relevant point in the present study is that three of the older age groups had increased fear, including young adults, mature adults, and older adults compared to the group of younger participants (18-19 years). Indeed, it was found in a global research that the older the age, the greater is the risk of mortality, complications, and poor prognosis related to COVID-19, which would explain the increased fear in these age groups [20-23]. So it is important to provide emotional support to people who are older, prioritizing older adults and those with some other risk factor, whether physical or mental; because if these groups do not know how to manage their fears, they could not only have thoughts about death, but they can also perform "bad" acts out of fear [24].

We also found that Catholics, evangelicals, agnostics, and atheists were less afraid of COVID-19. In this sense, it is worth noting that some religions, such as Christianity, have very dogmatic views, which associate life after death with the moral actions of human beings and the going of the soul to a place of reward or punishment [25]. A study carried out on anxiety in the face of death, concern about the time and fear associated with suffering from an illness, established that having religious beliefs and thinking about life after death generated greater anxiety [26].

Moreover, we observed that respondents with some risk for complications due to COVID-19 were more afraid in the face of government measures during the quarantine period, which coincides with what was reported in a study that included 1210 respondents from 194 cities in China. In this Chinese study was found that history of chronic diseases was significantly associated with higher scores in the Impact of Event Scale - Revised (IES-R), and in the DASS subscale regarding stress,

### Table 3. Multivariate analysis of the factors associated with being very afraid of the COVID-19 pandemic in Peru

| Variables                  | Prevalence ratio | 95% Confidence intervals | p-values |
|----------------------------|------------------|---------------------------|----------|
| Female                     | 1.37             | 1.26-1.48                 | <0.001   |
| Primary or secondary education | 0.96          | 0.83-1.09                 | 0.492    |
| Age categorized            |                  |                           |          |
| 18-19 years old            |                  |                           |          |
| 20-29 years old            | 1.26             | 1.06-1.50                 | 0.008    |
| 30-39 years old            | 1.53             | 1.28-1.82                 | <0.001   |
| 40-49 years old            | 1.22             | 0.96-1.54                 | 0.097    |
| 50-59 years old            | 1.43             | 1.12-1.84                 | 0.005    |
| 60 years or older          | 1.46             | 1.03-2.07                 | 0.032    |
| Religion                   |                  |                           |          |
| Catholic                   |                  |                           |          |
| Evangelist                 | 0.79             | 0.65-0.96                 | 0.018    |
| Agnostics                  | 0.80             | 0.68-0.94                 | 0.008    |
| Atheists                   | 0.67             | 0.48-0.95                 | 0.024    |
| Christian                  | 0.77             | 0.53-1.11                 | 0.160    |
| Adventist                  | 0.70             | 0.42-1.16                 | 0.162    |
| Jehovah’s Witness          | 1.89             | 0.91-3.92                 | 0.089    |
| Latter-days                | 1.23             | 0.83-1.81                 | 0.302    |
| Mormon                     | 1.19             | 0.87-1.64                 | 0.283    |
| Buddhist                   | 0.25             | 0.05-1.13                 | 0.071    |
| Another                    | 0.81             | 0.61-1.08                 | 0.159    |
| Type of respondent         |                  |                           |          |
| No risk                    |                  |                           |          |
| At risk                    | 1.49             | 1.32-1.69                 | <0.001   |
| Healthcare personnel       | 0.81             | 0.70-0.93                 | 0.003    |
| More health risks          | 0.75             | 0.38-1.47                 | 0.397    |

The dependent variable is the perceived fear of the COVID-19 pandemic. This variable was crossed with other variables using generalized linear models (with the Poisson distribution and a logarithmic link function, and models for robust variance adjusted according to the city of respondents).
anxiety, and depression [17]. Another study involving older adults from Mexico, a direct association was found between presence of comorbidities (cancer, systemic arterial hypertension, diabetes, hypercholesterolemia, depression, cerebral infarction, and cardiovascular disease) and positive self-rated health, while there was indirect association between presence of comorbidities and depressive symptoms [27]. Complementary to this, the results of a research that included patients diagnosed with type 2 diabetes mellitus from the Jonuta Community Hospital, in the Tabasco state, showed that 68.6% of the assessed patients had mild anxiety and 14.3% moderate anxiety, and a greater tendency towards depression was observed in those who experienced more anxiety [28]. In this sense, the creation of psychosocial support programs for people with comorbidities should be of paramount importance given that many of them may have better knowledge about COVID-19 and its complications, which could result in mental health disorders, putting them at greater risk.

In our study, it is also important to highlight the finding that healthcare personnel were less afraid of COVID-19; however this does not always occur similarly in different professional categories. In a cross-sectional study involving health workers from the Hospital of King Khalid University in Saudi Arabia was found that the mean anxiety score regarding MERS-CoV was similar for physicians as well as for other health workers; however, non-physicians expressed higher levels of anxiety toward the risk of transmitting MERS-CoV to their families [29].

Although the results obtained in this research are interesting, they may have been influenced by the fact that when the survey was carried out, there were not so many confirmed cases of infection or complication due to COVID-19 in Peru. In addition, there should be other important variables that may influence the fear of people related to coping with the pandemic, such as knowledge about the subject matter and perception of protective measures. This is also very important to be studied in health professionals from Peru.

Furthermore, the present study had the limitation of not being able to infer/extrapolate the results to the entire population of Peru, since a multi-stage sampling would be necessary to accomplish this objective. We cannot achieve this during the COVID-19 containment period, which corresponds to primary results of an investigation conducted by the Peruvian population. The fear was associated with the fact that Peru was under quarantine and curfew at the time of the online surveys, as well as with traffic restriction and closing of important institutions. However, the findings of this study are quite relevant, given that they correspond to primary results of an investigation conducted during the COVID-19 containment period, which corresponds to the first report of fear perception of thousands of Peruvians in relation to COVID-19. Despite this, the importance of further research is stressed, with more population, variables, and logistics.

CONCLUSION

Based on our findings, we conclude that there is an important fear perception related to the COVID-19 pandemic by the Peruvian population. The fear was associated with female sex, older age groups, some religious groups, people with some risk for complications, and healthcare professionals. We think that our results in the Peruvian population may open up new perspectives in order to investigate disorders related to mental health, such as depression, stress, and anxiety due to the current pandemic.

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