



SOCIAL SCIENCES
ORIGINAL ARTICLE

Factors associated with fatalism in the face of COVID-19 in 20 Peruvian cities in March 2020

Factores asociados al fatalismo ante la COVID-19 en 20 ciudades del Perú en marzo 2020

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ABSTRACT

Introduction: The COVID-19 pandemic has generated diverse reactions, but these have not yet been measured in the Latin American population.

Objective: To determine the factors associated with the perception of fatalism in the face of COVID-19 infection in inhabitants of 20 cities in Peru.

Material and Methods: A cross-sectional, multicenter study with a sample size of 2 466 people from 20 cities of Peru that measured fatalism during the COVID-19 pandemic was conducted through a validated survey (Cronbach's alpha: 0,78) consisting of 7 items. Statistical analysis was conducted in terms of each city, and $p < 0,05$ was considered significant.

Results: Of the 2 466 respondents, 36 % were depressed, 26 % thought that they might die, 17 % say that this was evidence of the end of the world, and 9 % could make a fatal decision. Women were more likely to engage in three of the fatalistic behaviors (becoming infected,

$p=0,020$; infecting others, $p = 0,004$, and becoming depressed, $p = 0,020$). At an older age there were 5 perceptions (infecting others, $p = 0,007$; becoming complicated, $p < 0,001$; becoming depressed, $p < 0,001$, thinking they would die, $p < 0,001$; or committing suicide, $p = 0,014$). Those at risk of complications of COVID-19 had 4 perceptions (infecting others, $p = 0,024$; becoming complicated, $p = 0,002$; thinking they would die, $p < 0,001$; and thinking that this is a sign of the end of the world, $p = 0,039$). Respondents who were agnostic exhibited a lower frequency in 5 perceptions, while atheist respondents showed a lower frequency in 2 perceptions.

Conclusion: Many fatalistic ideas are found among the population in the face of the coronavirus pandemic.

Keywords: Coronavirus, pandemic, perception, Peru, SARS, COVID-19.

RESUMEN

Introducción: La pandemia del COVID-19 ha generado reacciones diversas, pero estas aún no han sido medidas en la población latinoamericana.

Objetivo: Determinar los factores asociados a la percepción de fatalismo ante la infección del COVID-19 en pobladores de 20 departamentos del Perú.

Material y Métodos: Estudio transversal analítico, de tipo multicéntrico que con una muestra de 2466 personas en 20 departamentos del Perú midió el fatalismo ante la pandemia del

COVID-19 a través de una encuesta validada (Alpha Crombach: 0,78) que consistía en 7 ítems. El análisis estadístico fue realizado en función de cada ciudad y se consideró significativos $p < 0,05$.

Resultados: De los 2466 encuestados, el 36 % se deprimirían, el 26 % piensa que podrían fallecer, el 17 % dice que esto es evidencia del fin del mundo y el 9 % podrían tomar una decisión fatal. Las mujeres tuvieron mayor frecuencia de 3 de las conductas fatalistas (contagiarse $p=0,020$; contagiar a otros $p=0,004$ y deprimirse $p=0,020$). A mayor edad hubo 5 percepciones (contagiar a



otros $p=0,007$; complicarse $p<0,001$; deprimirse $p<0,001$, pensar que morirían $p<0,001$ o suicidarse $p=0,014$). Los que tenían un riesgo para complicación por COVID-19 tuvieron 4 percepciones (contagiar a otros $p=0,024$; complicarse $p=0,002$; pensar que morirían $p<0,001$ y que esto es señal del fin del mundo

INTRODUCTION

There have been reports of patients from all over the world facing a disease or condition who have had fatal ideas and even actions. For example, in Denmark an association was found between attempted suicide and neurological diseases such as stroke (OR: 3,1), Huntington's (OR: 8,8), amyotrophic lateral sclerosis (OR: 5,0), Parkinson's (OR: 2,9) and Alzheimer's (OR: 4,8), among others.⁽¹⁾ In France, it was reported that Parkinson's patients exhibited frequencies of 1 % and 4 % for completed and attempted suicide, respectively.⁽²⁾ In Gran Canaria, 30 % of patients attempted suicide and 49 % exhibited suicide ideation.⁽³⁾ In Shandong, it was found that 69 % of older adults with chronic disease had suicidal thoughts.⁽⁴⁾ In Taiwan, 60 % of patients with heart failure died by suicide.⁽⁵⁾ In the USA, it was shown that patients with cardiovascular disease have more suicidal ideation ($p < 0.001$).⁽⁶⁾

Multiple investigations have revealed several such instances of fatalism in Peru as well. For instance, it has been reported that one out of every four older adults with chronic disease has established depression,⁽⁷⁾ 28 % of the patients within the age group of 16-30 years presented with death by suicide associated with severe

$p=0,039$). El ser agnóstico tuvo menor frecuencia de 5 percepciones, el ser ateo en 2.

Conclusión: Se halló muchas ideas fatalistas entre la población ante la pandemia de coronavirus.

Palabras clave: Coronavirus, pandemia, percepción, Perú, SARS, COVID-19

depression⁽⁸⁾ and 12 % and 100 % of patients diagnosed with HIV had suicidal ideation or some degree of depression, respectively.⁽⁹⁾

This can be seen not only in cases of proven disease, but also in stressful situations that have been experienced in recent years, such as the epidemics of zika, chinkunguya, dengue, non-communicable diseases, and psychological morbidities.⁽¹⁰⁾ This could be due to the high transmission capacity and the declaration of a global health emergency, among others.⁽¹¹⁾ In addition, panic levels are often enhanced by the proclamation of extraordinary measures such as the closing of borders, social isolation, cancellation of massive events, and temporary shortages in some cases in different countries which provokes negative reactions such as panic, fear, and fear of being infected themselves or their families getting infected in the population.⁽¹²⁾ All of this together could lead to thoughts and even fatal decisions, such as suicide.

The **objective** of this research is to determine the characteristics and factors associated with the perception of fatalism in the face of COVID-19 infection in inhabitants of 20 cities in Peru.



MATERIAL AND METHODS

An analytical multicentric transversal study was carried out in March 2020 in 20 Peruvian cities: Arequipa, Ayacucho, Cajamarca, Pasco, Lambayeque, Ancash, Cusco, Junín, Huánuco, Ica, Loreto, Lima, Piura, Ucayali, Puno, Tacna, Moquegua, San Martín, Huancavelica, and La Libertad, which are the largest and most important in the country.

For the study, a non-random sample was taken, through a snowball type sampling, where each of the authors sent the survey (in a virtual format) to their close contacts (family and friends from medical school). The survey was subsequently passed on to others by these contacts, to create a chain of sampling, until a minimum sample size of 2 422 people was reached. This sample size was calculated based on the minimum amount required for a 3 % difference between the crosses (48 % versus 51 %), with a statistical power of 84 %, at a 95 % confidence level and for a single sample (due to the analytical cross-sectional design).

The following inclusion criteria were then applied: people residing in the above-mentioned sites at the time of the study who showed interest in participating in the research; and who reported having or not having any risk for a COVID-19 complication (being elderly, an oncology patient, or with a hypertensive disease). There were no exclusions.

The research was based on the application of a questionnaire that measures the perception or belief of possible situations after COVID-19 infection, through 7 items (figure 1). Each

respondent was provided 5 possible answers (strongly disagree, disagree, indifferent, agree and strongly agree). Validation was performed in 5 steps. Firstly, literature from international journals was surveyed and the opinions of 30 experts (infectologists, internists, intensivists, epidemiologists, among others) were taken into account. Subsequently, the collected data was submitted for a statistical check, where the evidence of validity and the quantification of relevance were performed in almost 400 respondents at the national level, which suggested that the data was clear and representative of the population.⁽¹³⁾

The statistics showed that the KMO (0.779) and Bartlett ($p < 0.001$) were good and statistically adequate. The observed total variance of almost 60 % could be explained by 2 factors. Factor 1 was composed of survey items 4, 5, 6, and 7, and factor 2 was composed of survey items 1, 2, and 3. In addition, with robust analysis, a satisfactory factor structure was found ($X^2 = 21,161$; $p = 0,007$; IFC = 0,984; GFI = 0,996; TLI = 0,957; RMSEA = 0,067 and RMSR = 0,033). Collection of some important variables was also considered in order to generate analytical statistics, such as sex (male or female), age (in years), educational level (which for statistical purposes was categorized as up to secondary school or higher; this last category included technical studies, university studies and postgraduate studies), religion (categorized according to the most frequent) and being associated with some risk of complications from



the disease (older adults, cancer patients, immunodeficiencies, liver diseases, and pregnant women, autoimmune diseases, and cardiovascular diseases).

Fig. 1 - Questions contained within the data collection instrument

If you were to get Coronavirus, what would your opinion be of following statements?
1. I think at my job/university I would get the Coronavirus.
2. I think I will infect my family/friends.
3. I think I will be admitted to a hospital for a complication.
4. I think getting this virus will make me depressed.
5. I believe that by catching this virus, I could die (I will die from the virus).
6. I think that by catching it I could make a fatal decision (like suicide).
7. I think this is evidence that the “end of the world” is coming.

The surveys were conducted through a virtual test on Google Drive. After the closing of the survey, data quality control was carried out by excluding those who did not meet the selection criteria (21 people who did not answer most of the questions, 23 people who lived abroad, and 110 who were minors). The data were then coded and transferred to a spreadsheet in Microsoft Excel (for Windows 2019). On this sheet, a second screening of the information was carried out, and a quality control check for each location was performed. The data were then exported to the Stata Statistical Software (version 11.1).

Cronbach's Alpha was evaluated and a score of 0,78 was obtained for the 7 items, which were represented using a bar plot. In order to obtain adjusted prevalence ratios, 95 % confidence

intervals and p-values, generalized linear models were used; this was done with Poisson's family, log-link function, models for robust variances and with adjustment for each of the locations of respondents (each population is particular in its customs, social environments and even in the way it perceives and reacts to the disease). P-values below 0.05 were considered statistically significant.

The ethical parameters of the research were respected at all times. The respondents were informed that their participation was voluntary, and the surveys were anonymous (to respect the privacy of the respondents and to give them certainty that we would not be able to identify them; so that they could respond freely about their perceptions).

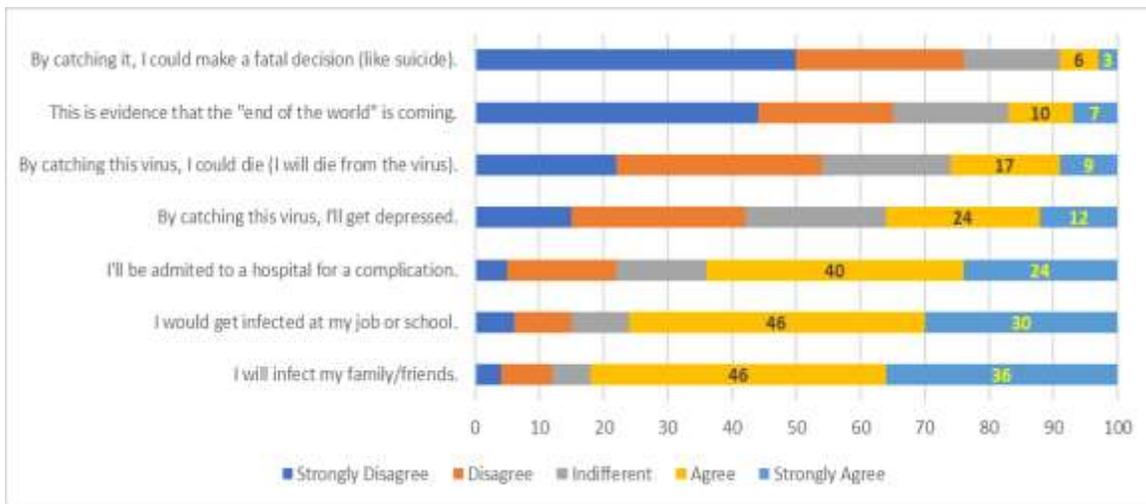


RESULTS

Of the 2 466 respondents, 86 % perceived that they would infect their family and friends (36 % and 46 % strongly agreed and agreed, respectively), 76 % perceived that they would be infected at work or school (30 % and 46 % strongly agreed and agreed, respectively) and 64 % thought that they would have a complication

(24 % and 40 % strongly agreed and agreed, respectively). In addition, a large number of respondents agreed that they would become depressed (36 %), that they might die (26 %), that this is evidence that the end of the world is coming (17 %) or that they might make a fatal decision (9 %). (Figure 2).

Fig. 2 - Perceptions of fatalism due to COVID-19 infection in inhabitants of 20 cities in Peru



In the factors associated in the multivariate model, it was found that women perceived that they would be infected at work/school (p-value = 0,020) or that they could then infect their relatives/friends (p = 0,004); the older they got, the more they perceived that they could infect their relatives/friends (p = 0,007) or that they

would get complicated (p < 0,001). Those at risk for complications from COVID-19 had a greater perception of being able to infect their relatives/friends (p = 0,024) or that they would get complications (p = 0,002); agnostics had a lower perception of getting complications (p = 0,012). (Table 1).



Table 1 - Factors associated with the perception of infection, contagion and complication by COVID-19

Variables	I would catch it	I would infect others	It would make it difficult for me
Women	1,05 (1,01-1,10) 0,020	1,06 (1,02-1,10) 0,004	Not significant
Age (Years)*	Not significant	1,002 (1,001-1,003) 0,007	1,006 (1,004-1,008) <0,001
Higher education	Not significant	Not significant	Not significant
Religion**			
Evangelical	Not significant	Not significant	Not significant
Christians	Not significant	Not significant	Not significant
Adventists	Not significant	Not significant	Not significant
Last days	Not significant	Not significant	Not significant
Agnostics	Not significant	Not significant	0,77 (0,63-0,94) 0,012
Atheists	Not significant	Not significant	Not significant
Others	Not significant	Not significant	Not significant
With risk of complication	Not significant	1,07 (1,01-1,13) 0,024	1,16 (1,05-1,27) 0,002

*This variable was taken in its quantitative form. Prevalence ratios (95 % confidence intervals) and p-values were obtained with generalized linear models, with the Poisson family, log-link function, robust models and adjusting by residence site.

**The Catholic religion served as a comparison group versus the other religions (the results are shown against this category in each religion).

Another multivariate model also found that women perceived that they could become depressed if they were infected ($p = 0,020$); the older they were, the more they perceived that they could become depressed ($p < 0,001$) or that they could die ($p < 0,001$); those at risk for

complications from COVID-19 had a higher perception that they might die ($p < 0,001$); agnostics had a lower perception of being depressed ($p = 0,007$) or that they might die ($p = 0,002$); atheists also had a lower perception of being depressed ($p = 0,045$). (Table 2).



Table 2 - Factors associated with the perception of depression or death in case of infection by COVID-19 in inhabitants of 20 Peruvian cities

Variables	I would be depressed	I think I would die
Women	1,16 (1,02-1,32) 0,020	Not significant
Age (Years)*	1,010 (1,006-1,014) <0,001	1,013 (1,007-1,018) <0,001
Higher education	Not significant	Not significant
Religion**		
Evangelical	Not significant	Not significant
Christians	Not significant	Not significant
Adventists	Not significant	Not significant
Last days	Not significant	Not significant
Agnostics	0,69 (0,53-0,90) 0,007	0,55 (0,38-0,80) 0,002
Atheists	0,76 (0,57-0,99) 0,045	Not significant
Others	Not significant	Not significant
With risk of complication	Not significant	1,71 (1,35-2,15) <0,001

*This variable was taken in its quantitative form. Prevalence ratios (95 % confidence intervals) and p-values were obtained with generalized linear models, with the Poisson family, log-link function, robust models and adjusting by residence site.

**The Catholic religion served as a comparison group versus the other religions (the results are shown against this category in each religion).

We also found in the multivariate model with the two final questions that the older the respondents were, the greater was the perception to make a fatal decision if they were infected ($p = 0,014$); those at risk for COVID-19 complications had a greater perception that this is proof of the end of the world ($p = 0,039$); the propensity to consider suicide if they were

infected was higher among evangelicals ($p = 0,048$) but lower among agnostics ($p = 0,011$); and perceiving this as proof of the end of the world was higher among evangelicals ($p < 0,001$), Christians ($p = 0,025$), Adventists ($p < 0,001$), and those in the latter-day church ($p < 0,001$); but it was lower among agnostics ($p = 0,026$) and atheists ($p = 0,038$). (Table 3).



Table 3 - Factors associated with the possibility of making a fatal decision or thinking that this situation is proof of the end of the world

Variables	I would kill myself	This is proof of the end of the world
Women	Not significant	Not significant
Age (Years)*	1,013 (1,002-1,023) 0,014	Not significant
Higher education	Not significant	Not significant
Religion**		
Evangelical	1,44 (1,00-2,07) 0,048	2,64 (2,06-3,38) <0,001
Christians	Not significant	1,95 (1,09-3,50) 0025
Adventists	Not significant	3,98 (2,75-5,74) <0,001
Last days	Not significant	3,30 (2,20-4,97) <0,001
Agnostics	0,47 (0,26-0,84) 0,011	0,43 (0,20-0,90) 0,026
Atheists	Not significant	0,69 (0,49-0,98) 0,038
Others	Not significant	Not significant
With risk of complication	Not significant	1,58 (1,02-2,44) 0,039

*This variable was taken in its quantitative form. Prevalence ratios (95 % confidence intervals) and p-values were obtained with generalized linear models, with the Poisson family, log-link function, robust models and adjusting by residence site.

**The Catholic religion served as a comparison group versus the other religions (the results are shown against this category in each religion).

DISCUSSION

We found that many people thought they might die, that this is evidence that the end of the world is coming or that they might make a fatal decision (one in four, one in five or one in ten, respectively). These perceptions show that a large percentage of the population is very fearful and may think of fatal outcomes. Therefore, in pandemics like COVID-19, more information must be provided to the population through reliable and understandable methods in order to spread accurate information and avoid panic.⁽¹²⁾ This should be managed with mental health support, both during and after the crisis, since, as has been demonstrated in other disasters, it is important that post-traumatic stress is measured and interventions are planned.^(14,15)

The perception of contagion at work/study center, infecting other members of their family/friends, or becoming depressed was higher in women, suggesting that women exhibit higher anxiety and stress in these situations. This has also been reported in several investigations where young women present more stress and occupational exhaustion compared to middle-aged women and men.⁽¹⁶⁾ This could also be influenced by genetics⁽¹⁷⁾ and history; it is known that emotional stability is genetically associated with MAOA-uVNTR polymorphism, and women have the highest expression of MAO-A, and therefore, exhibit higher levels of emotional instability.⁽¹⁸⁾ In this context, they are also the ones who take responsibility for the household,



ensuring the physical, emotional and spiritual well-being of their family members, as well as for the supply of essentials and other issues associated with this emergency.^(17,18,19)

The older the respondents, the more they perceived that they could infect other family members/friends, that they could become depressed, that they could die or make a fatal decision. These data show that older adults are at the greatest risk of generating serious conditions from this disease.⁽²⁰⁾ The possibility of making a fatal decision is heightened due to their vulnerability to depression that is typical of old age, due to circumstances in which they live and other pathologies or chronic illnesses that they may suffer,⁽²¹⁾ which have been widely associated with suicidal tendencies.⁽⁴⁾ In addition, a large percentage of older adults with chronic illness have established depression.⁽⁷⁾ As a consequence, it is recommended that the government takes precautions to support the mental health of this specific population.⁽²²⁾

Those at a risk for complications from COVID-19 had a greater perception that they could infect other family members/friends, that they could die, or that this was a sign that "the end of the world" was coming. Consequently, this population perceived that they could be a factor in spreading the disease to those close to them, as they are known to be at increased risk for severe symptoms of the disease. However, it is important to note that a large fraction of this group perceived that these facts were a sign of the "end of the world." Therefore, specific studies should be conducted to determine the cause of

such perceptions in the most vulnerable population.

Agnostics and atheists were less inclined to believe that they would get complicated, that they would get depressed, that they would die, that they would make a fatal decision or that this was proof of the "end of the world." The result can be attributed to their beliefs, because it has been seen that these groups believe more in science and facts in general. This does not suggest that those who follow a religion do not believe in science or facts. However, those who follow a religious belief sometimes have thoughts that are guided by their sacred books and manuscripts, as well as by religious leaders.^(23,24)

Evangelicals may make a fatal decision or think of it is a sign that "the end of the world" is coming. Such a perception was also more common among those who believe in Christianity, Adventism, and those belonging to the latter-day Church. Some references show us that some religious people have significantly higher levels of anxiety, paranoia, obsession and compulsion than atheists, who have fewer mental problems and physical health issues than agnostics.⁽²⁵⁾

Consequently, it is not relevant to say that being religious is a risk factor in the development of a fatalistic attitude. However, there may be certain conditions that influence the perception of this group and thus directly affect their mental health.⁽²⁶⁾ It is suggested that this finding be further investigated, as it could also be the subject of in-depth studies in a large population, in order to find a causal link.

The limitation of the study was the selection bias, since the results cannot be extrapolated to the



whole of Peru. However, because of the large sample size obtained, in addition to the large diversity of sites, it is believed that this may be a good reflection of what is currently happening in

CONCLUSIONS

It is concluded that the factors associated with a fatalistic attitude in the face of COVID-19 pandemic in Peru are: being female, being older,

RECOMENDATIONS

It is recommended that the cities each evaluate the situation, carry out situational analysis studies, and collect information in this moment of crisis. Furthermore, knowing that there are logistical limitations of restricted mobility and the

our environment, and even what could be happening in other countries with similar realities.

being a patient at risk, and belonging to a religion. In contrast, atheists and agnostics had a lower perception of fatalism.

cessation of other important administrative entities, it is equally important to continue implementing strategies of data collection to bring awareness to the current situation.

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Conflict of interest

The authors declare that there is no conflict of interest.

Author contribution

All authors contributed to the conception of the project, development of the data collection instrument, development of the pilot, information collection, data processing, statistical analysis, manuscript writing and approval of the final version of the manuscript.

