Prevalence of post-traumatic stress disorder (PTSD) risk post-COVID-19 in 12 countries in Latin America: a cross-sectional survey

Christian R. Mejia[1], VICTOR SERNA-ALARCÓN[2, 3], Martín Vilela Estada[2, 3], Jose Armada[4], Milward Ubillus[5], Jose Beraún-Barrantes[5], Shyla Del-Aguila-Arcentales[6*], Aldo Álvarez-Risco[7], Neal M. Davies[8, 9], Dr. Jaime A. Yáñez, Ph.D.[7]

[1]Universidad Norbert Wiener, Peru, [2]Hospital Regional José Cayetano Heredia, EsSalud, Peru, [3]Antenor Orrego Private University, Peru, [4]Universidad Continental, Peru, [5]Universidad de Huanuco, Peru, [6]Saint Ignatius of Loyola University, Peru, [7]Universidad Peruana de Ciencias Aplicadas, Peru, [8]University of Alberta, Canada, [9]Asociación Médica de Investigación y Servicios en Salud, Peru

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Scope Statement

The manuscript is focused on the impact of COVID-19 y mental health as post-traumatic stress disorder. The analysis is relevant because was done in 12 countries in Latin America. These outcomes are relevant to the infectious diseases arena and epidemiology issues.

Conflict of interest statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest

CRedIT Author Statement

Christian R. Mejia: Conceptualization, Formal Analysis, Investigation, Methodology, Software, Supervision, Visualization, Writing – original draft, Writing – review & editing. Dr. Jaime A. Yáñez, Ph.D.: Supervision, Visualization, Writing – original draft, Writing – review & editing. Jose Armada: Investigation, Methodology, Supervision, Visualization, Writing – original draft, Writing – review & editing. Jose Beraún-Barrantes: Resources, Supervision, Visualization, Writing – original draft, Writing – review & editing. Martín Vilela Estada: Conceptualization, Investigation, Supervision, Visualization, Writing – original draft, Writing – review & editing. Milward Ubillus: Resources, Validation, Visualization, Writing – original draft, Writing – review & editing. Neal M Davies: Resources, Visualization, Writing – original draft, Writing – review & editing. Aldo Álvarez-Risco: Formal Analysis, Methodology, Visualization, Writing – original draft, Writing – review & editing. Shyla Del-Aguila-Arcentales: Formal Analysis, Visualization, Writing – original draft, Writing – review & editing. VICTOR SERNA-ALARCÓN: Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing.

Keywords

COVID-19, Mental Health, Post-traumatic stress disorder, Latin America, Peru, PTSD

Abstract

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Latin America was the region most affected by COVID-19 in the second quarter of 2020 and consequently the impact on mental health must be evaluated. The aim is to assess the risk of post-traumatic stress disorder (PTSD) caused by bereavement due to COVID-19 in 12 countries in Latin America. The current study is an analytical cross-sectional study. Validated tests were applied for PTSD, depression, anxiety, and stress (DASS-21), questions about the respondent's condition or their environment, and demographic questions, as well as the suffering mourning period.. The outcomes demonstrate that the PTSD risk increased for woman ($p < 0.001$), when a friend or acquaintance had COVID-19 ($p = 0.002$), when a close relative died from COVID-19 ($p = 0.010$), having severe depression ($p < 0.001$), severe anxiety ($p < 0.001$), severe stress ($p < 0.001$), residing in Chile ($p < 0.001$), Paraguay ($p < 0.001$), Bolivia ($p < 0.001$), Costa Rica ($p < 0.001$) or El Salvador ($p = 0.005$), on the other hand, there was less risk of PTSD at an older age ($p < 0.001$) or if respondents had a sentimental partner ($p = 0.025$). In the case of severe PTSD, there was a greater gender risk for woman ($p < 0.001$), a close relative dying from COVID-19 ($p = 0.017$), having severe depression ($p < 0.001$), severe anxiety ($p < 0.001$), severe stress ($p < 0.001$), residing in Chile ($p < 0.001$), Paraguay ($p < 0.001$), Bolivia ($p < 0.001$) and Costa Rica ($p = 0.002$), on the other hand, there was less risk of severe PTSD at an older age demographic ($p < 0.001$). It is concluded that the percentages of PTSD are high in its severe presentation, especially, among Latin American women.

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Studies involving animal subjects

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Studies involving human subjects

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Inclusion of identifiable human data

Generated Statement: No potentially identifiable images or data are presented in this study.

Data availability statement

Generated Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Prevalence of post-traumatic stress disorder (PTSD) risk post-COVID-19 in 12 countries in Latin America: a cross-sectional survey

Christian R. Mejia[1], Víctor Serna-Alarcón[2,3], Martín A. Vilela-Estrada[2,3], Jose Armada[4], Milward Ubillus[5], Jose Beraún-Barrantes[5], Aldo Álvarez-Risco[6], Shyla Del-Aguila-Arcentales[7*], Neal M. Davies [8,9], Jaime A. Yáñez[10]

1. Universidad Norbert Wiener. Lima, Peru
2. Universidad Privada Antenor Orrego. Piura, Peru
3. Hospital Regional José Cayetano Heredia, EsSalud, Piura, Peru
4. Universidad Continental. Lima, Peru
5. Universidad de Huánuco, Huánuco, Peru
6. Universidad Peruana de Ciencias Aplicadas, Lima, Peru
7. Escuela de Posgrado, Universidad San Ignacio de Loyola, Lima, Peru.
8. Faculty of Pharmacy and Pharmaceutical Sciences University of Alberta, Edmonton, Alberta, Canada
9. Asociación Médica de Investigación y Servicios en Salud, Lima, Peru
10. Universidad Peruana de Ciencias Aplicadas. Facultad de Educacion, Carrera de Educacion y Gestion del Aprendizaje, Lima, Peru

Correspondence
Corresponding Author
sdelaguila@usil.edu.pe

Keywords: COVID-19, mental health, post-traumatic stress disorder, Latin America, Peru, PTSD

Abstract

Latin America was the region most affected by COVID-19 in the second quarter of 2020 and consequently the impact on mental health must be evaluated. The aim is to assess the risk of post-traumatic stress disorder (PTSD) caused by bereavement due to COVID-19 in 12 countries in Latin America. The current study is an analytical cross-sectional study. Validated tests were applied for PTSD, depression, anxiety, and stress (DASS-21), questions about the respondent's condition or their environment, demographic questions, as well as the suffering mourning period.. The outcomes demonstrate that the PTSD risk increased for woman ($p < 0.001$), when a friend or acquaintance had COVID-19 ($p = 0.002$), when a close relative died from COVID-19 ($p = 0.010$), having severe depression ($p < 0.001$), severe anxiety ($p < 0.001$), severe stress ($p < 0.001$), residing in Chile ($p < 0.001$), Paraguay ($p < 0.001$), Bolivia ($p < 0.001$), Costa Rica ($p < 0.001$) or El Salvador ($p = 0.005$), on the other hand, there was less risk of PTSD at an older age ($p < 0.001$) or if respondents had a sentimental partner ($p = 0.025$). In the case of severe PTSD, there was a greater gender risk for woman ($p < 0.001$), a close relative dying from COVID-19 ($p = 0.017$), having severe depression ($p < 0.001$), severe anxiety ($p < 0.001$), severe stress ($p < 0.001$), residing in Chile ($p < 0.001$), Paraguay ($p < 0.001$), Bolivia ($p < 0.001$) and Costa Rica ($p = 0.002$), on the other hand, there was less risk of severe PTSD at an older age

demographic ($p < 0.001$). It is concluded that the percentages of PTSD are high in its severe presentation, especially, among Latin American women.

Introduction

COVID-19 has become a major global socio-economic and health problem comparable to what could be caused by a large-scale war (Humphries 2014). The beginning of this pandemic arose at the end of 2019 (Petzold et al. 2020; Chan et al. 2020), having a significant impact on Europe during the first quarter of 2020 (Alifano et al. 2020) and affecting the American continent in the subsequent months (Garcia et al. 2020; Burki 2020; Kirby 2020). The pandemic caused significant morbidity and mortality in millions, as well as social and economic repercussions, sich as isolation, restrictions, and a host of additional problems and sequelae (Hiscott et al. 2020; Zhang et al. 2020). In addition, through mainstream and social media additional fear has been generated and exacerbated. (Bendau et al. 2021; Sasaki et al. 2020; Naeem 2021).

There is evidence that several illnesses such as hypertension (Sumner et al. 2016), diabetes (Trief et al. 2006; Agyemang et al. 2012); and ebola (Vyas et al. 2016; Cénat et al. 2020; Bah et al. 2020), SARS (Alberque et al. 2022), and H7N9 (Tang et al. 2017), and H1N1 (Elizarrarás-Rivas et al. 2010) can generate PTSD. Measurement of PTSD using DASS-21 (Kok et al. 2014; Guest et al. 2018; Chudzicka-Czupała et al. 2023; Li et al. 2020) has previously been undertaken. Howeverm few studies linking PTSD and COVID-19 in survivors (Kaseda and Levine 2020; Liu, Erdei, and Mittal 2021) and healthcare workers (Carmassi et al. 2020; Blekas et al. 2020) have been published.

The possible impact on population mental health (Sakib et al. 2023) especially those who suffered from the disease, had relatives who were infected or even died from this pathology have been addressed (Torales et al. 2020). In highly affected populations, such as Peru, which became the country with the world's highest per-capita mortality (Mas-Ubillus et al. 2022; Dyer 2021) significant mental health issues have arisen. In addition, other Latin American countries have also been significantly affected. (Sakellariou, Malfitano, and Rotarou 2020; Rodriguez-Morales et al. 2020; Andrus et al. 2020). The objective of this stydt was to evaluate the risk of PTSD according to the immediate environment's suffering or grief after exposure to COVID-19 in 12 countries in Latin America.

Material and methods

Study design

We conducted an online cross-sectional multicenter survey in Spanish-speaking countries (Peru, Chile, Paraguay, Mexico, Colombia, Bolivia, Panama, Ecuador, Costa Rica, El Salvador, Honduras and Guatemala) between June 7 to August 30, 2021, which were the pandemic months with the most significant impact in Latin America. It was determined that a minimum sample size of 3,204 was necessary to achieve a minimum percentage difference of 2.5% (49.0% versus 51.5%), a statistical power of 80%, and a confidence level of 95% (data not shown). The sample size was calculated using power analysis (Schmidt, Lo, and Hollestein 2018) and based on a previous study in Peru that assessed PTSD after a natural phenomenon (Iglesias-Osores et al. 2020).

The actual survey consisted of an online questionnaire in Google surveys that was sent via WhatsApp, Messenger, and Facebook, and it was configured to enable submission of an email at the end of the survey so that investigation group to insure individual data submitted. . The shared questionnaire

was made anonymous ensuring data confidentiality and reliability. This survey was undertaken in Spanish since we surveyed only Spanish-speaking countries in Latin America. The survey was performed from June 7 to August 30 2021 after approximately 3 to 5 months of lockdown and social distancing measures in Latin America due to the COVID-19 outbreak. At the beginning of the survey (June 7) the number of COVID-19 confirmed cases in the surveyed countries totaled 625 495 with 36 287 confirmed deaths, while at the end of the survey (August 30) the confirmed cases increased to 2 685 447 and the deaths increased to 136 068. We surveyed the general public with adults (over 18 years old) in all countries that participated in the survey (Peru, Chile, Paraguay, Mexico, Colombia, Bolivia, Panama, Ecuador, Costa Rica, El Salvador, Honduras and Guatemala). Participants were recruited through the FELSOCEM-ASOMEDISS COVID-19 Latam (which is an organization of physicians and medical students from almost every country of Latin America), a network of investigators that include physicians, health professionals and students performing COVID-19 social epidemiological studies in Peru and Latin America.

Outcomes and Covariates

The survey (Annex 1) included 46 questions, 13 were demographic questions, 21 of the DASS-21 test and 12 questions related to suffering from post-traumatic stress and also having this pathology, but in a severe stage (with suicidal ideation), both by applying the test Short Post-traumatic Stress Disorder Rating Interview (SPRINT-E) created in 2001 to measure the symptoms of this pathology (Connor and Davidson 2001). The instrument has been used in Chile, where it obtained a value of 0.92 for Cronbach's Alpha (Leiva Bianchi and Gallardo Cuadra 2013); in the current study, an Cronbach's Alpha of 0.93 was obtained. For anxiety, stress, and depression, the DASS-21 test was used, which has been validated and used in multiple settings (Gloster et al. 2008), where the severe category was used for each case; a Cronbach's Alpha of 0.96 was obtained.

There were multiple exposure variables: if a friend or close acquaintance was afflicted with COVID-19, if a friend or acquaintance died from COVID-19, if someone at home was sick from COVID-19, if a family member was not at home, he/she became ill from COVID-19 if a close relative died from COVID-19 if a distant relative died from COVID-19 if it was suspected or it is very likely that someonee had COVID-19 (according to the report of having symptoms, but not a confirmatory test) and had or became ill with COVID-19 (confirmed with rapid or molecular test). The demographic questions included city where they live, gender, age, marital status, education level, job status, and type of job.

Also, the variables of gender (male or female), age (in completed years), level of education (university / postgraduate or a lower academic level), if they had a romantic partner (yes or no), and the country of residence (of the 12 countries already mentioned). There were multiple exposure variables: if a friend or close acquaintance became sick from COVID-19, if a friend or acquaintance died from COVID-19, if someone at home fell ill from COVID-19, if a family member was not at home, became ill from COVID-19 if a close relative died from COVID-19 if a distant relative died from COVID-19 if it was suspected or it is very likely that they had contracted COVID-19 (according to the report of having symptoms, but not a confirmatory test) and had or became ill with COVID-19 (confirmed with rapid or molecular test).

Ethics approval

The research has the approval of a human ethics committee in Peru (Resolution of the bioethics committee No. 0240-2020-UPAO). The same endorsement could not be made in other countries since the pandemic generated the closure of most of these institutions that housed researchers at the pandemic. After obtaining approval in Peru, we proceeded with the respondents in the various countries; in each one, a non-random sample was obtained (due to the difficulty of having official lists). The participants remained anonymous and had the option to finish the survey at any time, and their information was kept confidential. All the survey participants were well-versed on the study intentions and were required to consent before the enrollment. The participants were not involved in any of the planning, execution and reporting stages of the study.

Statistical analysis

Data analysis was done in STATA version 14 (Stata Corp) with a significance level set at $p<0.05$. The instrument validity was assessed with the known-groups validity approach by fitting multivariate analysis. Univariate statistics was performed using frequencies and percentages for categorical variables. A description of the variables was made in each country, showing the percentages of the dependent variables and anxiety, depression, and stress (in its severe form). Then, the bivariate models were carried out, where each independent variable was crossed with the two dependent variables, from which they were statistically significant ($p<0.05$) and they were entered into the multivariate model. For analytical statistics, adjusted prevalence ratios (aPR) and 95% confidence intervals (CI) were obtained using generalized linear models (GLM), with Poisson family, log-link function, robust models to adjust for the large sample size; all this with the use of generalized linear models, with the Poisson family, the log link function and with models for robust variances (to adjust for the large sample size).

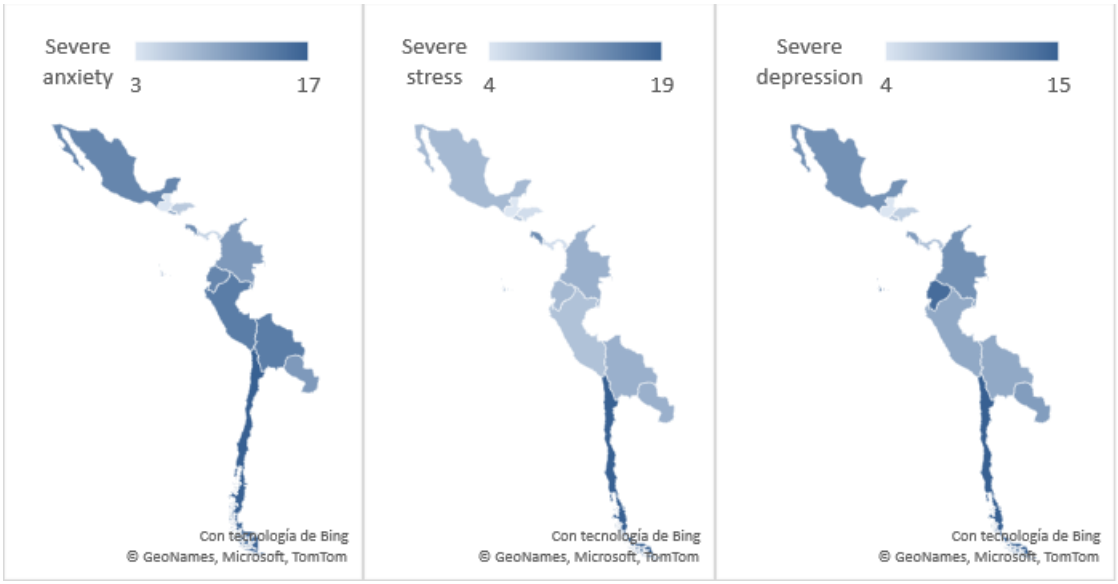
Results

Sociodemographic characteristics of the respondents

The survey was sent to 9000 people in Peru, Chile, Paraguay, Mexico, Colombia, Bolivia, Panama, Ecuador, Costa Rica, El Salvador, Honduras and Guatemala, in order to achieve the minimum sample size of 3,204 calculated based on power analysis. Out of the 9000 surveys sent online, we received 8194 responses indicating a 91.0% response rate. Most participants were female (4854 [59.2%]), aged 18 to 89 years, single (6699 [81.8%]), had some university studies or higher (5750 [70.2%]) and had a romantic partner (3669 [44.8%]) The country evaluated with highest response was Peru with 4026 surveys and has had the most deaths/infections (19,20). The population was also evaluated in: Chile (738), Mexico (647), Paraguay (583), Colombia (435), Bolivia (385), Panama (374), Ecuador (279), Costa Rica (256), El Salvador (199), Honduras (162) and Guatemala (110).

Of the 8194 respondents in Latin America, a higher frequency of severe episodes of anxiety (Chile 17%, Peru 14%, and Bolivia 14%), stress (Chile 19% and Costa Rica 14%), and depression (Chile 15% and Ecuador 14%). Also, there was a high frequency of PTSD (Chile 37%, Paraguay 30%, and Bolivia 30%) and severe PTSD (Chile 22%, Costa Rica 16%, and Bolivia 16%) (Figure 1).

Figure 1. Severe anxiety, severe stress, severe depression, PTSD, and severe PTSD in 12 Latin American countries during the COVID-19 pandemic.



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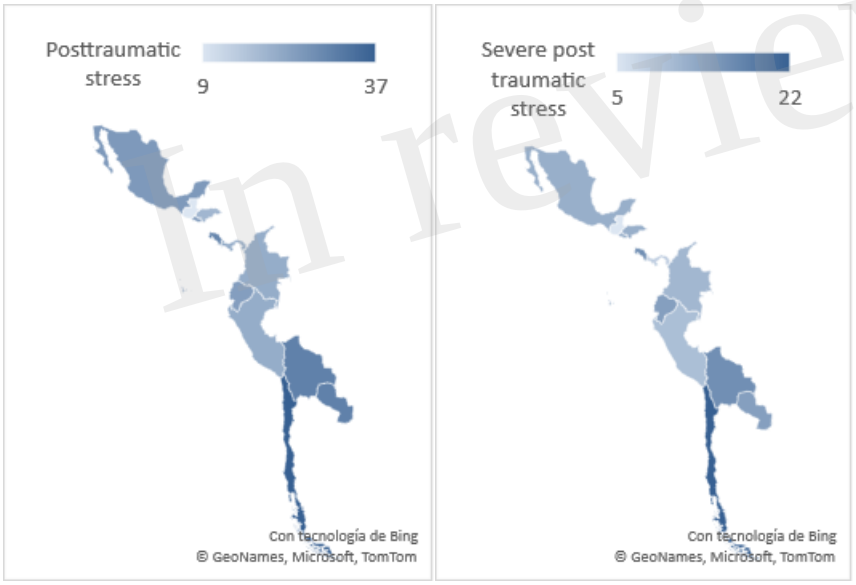

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166 In the bivariate analysis, it was determined that there was more PTSD or severe PTSD among
167 women ($p < 0.001$ for both), among those who had a friend or acquaintance with the diagnosis of COVID-
168 19 ($p < 0.001$ for both), among those who had a relative outside the home with COVID-19 ($p < 0.035$ for
169 both), if a close relative died from COVID-19 ($p < 0.002$ for both), if a distant relative died from COVID-
170 19 ($p < 0.001$ for PTSD), if the respondent suspected COVID-19 ($p = 0.002$ for both), if the respondent
171 confirmed that they had COVID-19 ($p = 0.008$ for severe PTSD), yes is that at the time of the survey he
172 had severe depression ($p < 0.001$ for both), severe anxiety ($p < 0.001$ for both) or severe stress ($p < 0.001$
173 for both); likewise, compared to Peru, there was greater prevalence amongst those who resided in Chile
174 ($p < 0.001$ for both), Mexico ($p = 0.019$ for PTSD), Paraguay ($p < 0.002$ for both), Bolivia ($p < 0.001$ for
175 both), Costa Rica ($p < 0.008$ for both) or Guatemala ($p = 0.005$ for PTSD); on the contrary, the risk was
176 reduced with advanced age ($p < 0.001$ for both) and by having a romantic partner ($p < 0.001$ for EPT)
177 (Table 1).
178

Table 1. Bivariate analysis of risk factors for post-traumatic stress disorder (PTSD) and severe PTSD in 12 Latin American countries during the COVID-19 pandemic (n=8194)

Variables	Post-traumatic stress disorder (PTSD)	Severe PTSD
Women	1.80 (1.65-1.96) <0.001	1.94 (1.70-2.21) <0.001
Age (years)	0.97 (0.97-0.98) <0.001	0.97 (0.96-0.97) <0.001
University studies	1.01 (0.93-1.10) 0.836	1.09 (0.96-1.24) 0.175
Has a sentimental partner	0.86 (0.80-0.93) <0.001	0.91 (0.81-1.03) 0.126
Friend or acquaintance with COVID-19	1.26 (1.16-1.37) <0.001	1.31 (1.16-1.48) <0.001
Friend or acquaintance who died from COVID-19	1.07 (0.98-1.18) 0.132	1.07 (0.93-1.23) 0.321
Family at home with COVID-19	1.11 (0.93-1.33) 0.241	1.19 (0.92-1.54) 0.178
Family away from home with COVID-19	1.17 (1.07-1.28) 0.001	1.16 (1.01-1.34) 0.034
Close family died from COVID-19	1.32 (1.15-1.51) <0.001	1.41 (1.15-1.73) 0.001
Distant family died of COVID-19	1.23 (1.10-1.37) <0.001	1.03 (0.86-1.24) 0.720
Respondent could have COVID-19	1.25 (1.08-1.45) 0.002	1.39 (1.13-1.72) 0.002
Surveyed with confirmed COVID-19	1.19 (0.93-1.52) 0.159	1.55 (1.12-2.14) 0.008
With severe depression (DASS-21 test)	4.01 (3.77-4.27) <0.001	7.74 (7.00-8.56) <0.001
With severe anxiety (DASS-21 test)	3.85 (3.61-4.11) <0.001	6.48 (5.83-7.20) <0.001
With severe stress (DASS-21 test)	4.20 (3.95-4.46) <0.001	7.54 (6.82-8.33) <0.001
Country of residence		
Peru	Comparison category	Comparison category
Chile	1.72 (1.54-1.93) <0.001	2.14 (1.82-2.52) <0.001
Mexico	1.19 (1.03-1.37) 0.019	1.13 (0.90-1.42) 0.293
Paraguay	1.38 (1.20-1.59) <0.001	1.44 (1.16-1.78) 0.001
Colombia	0.99 (0.82-1.20) 0.938	1.04 (0.78-1.38) 0.784
Bolivia	1.39 (1.18-1.64) <0.001	1.55 (1.21-1.98) <0.001
Panama	0.97 (0.78-1.19) 0.745	0.80 (0.56-1.13) 0.206
Ecuador	1.11 (0.89-1.38) 0.350	1.31 (0.96-1.78) 0.085
Costa Rica	1.36 (1.11-1.66) 0.003	1.50 (1.12-2.03) 0.007
El Salvador	1.15 (0.90-1.48) 0.258	1.11 (0.75-1.65) 0.595
Honduras	0.87 (0.63-1.21) 0.402	1.13 (0.73-1.74) 0.580
Guatemala	0.43 (0.24-0.77) 0.005	0.53 (0.24-1.15) 0.107

Relative risks (left), 95% confidence intervals (within parentheses), and p-values (right) were obtained with generalized linear models, with the log link function and models for robust variances.

Multivariate analysis was performed, a higher risk of suffering PTSD was maintained among women ($p < 0.001$), if a friend or acquaintance had COVID-19 ($p = 0.002$), if a close relative died from COVID-19 ($p = 0.010$), if they had severe depression ($p < 0.001$), severe anxiety ($p < 0.001$) or severe stress ($p < 0.001$) at the time of the survey, as well as, among those who resided in Chile ($p < 0.001$), Paraguay ($p < 0.001$), Bolivia ($p < 0.001$), Costa Rica ($p < 0.001$) or El Salvador ($p = 0.005$), on the other hand, there was less risk of PTSD at ad advanced age ($p < 0.001$) or if the respondent had a sentimental partner ($p = 0.025$); adjusted for three variables (Table 2).

For severe PTSD, there was a higher risk among women ($p < 0.001$), if a close relative died from COVID-19 ($p = 0.017$), among those with severe depression ($p < 0.001$), severe anxiety ($p < 0.001$), severe stress ($p < 0.001$); also, among those who resided in Chile ($p < 0.001$), Paraguay ($p < 0.001$), Bolivia ($p < 0.001$) and Costa Rica ($p = 0.002$), on the other hand, there was a lower risk of severe PTS at an older age ($p < 0.001$); adjusted by four variables (Table 2).

Table 2. Multivariate Analysis of Risk Factors for PTSD and Severe PTSD in 12 Latin American Countries During the COVID-19 Pandemic (n=8194)

Variables	Post-traumatic stress disorder (PTSD)	Severe PTSD
Women	1.55 (1.42-1.68) <0.001	1.51 (1.34-1.71) <0.001
Age (years)	0.98 (0.98-0.98) <0.001	0.98 (0.98-0,99) <0.001
University studies	Did not enter the model	Did not enter the model
Has a sentimental partner	0.92 (0.85-0.99) 0.025	Did not enter the model
Friend or acquaintance with COVID-19	1.14 (1.05-1.23) 0.002	1.12 (1.00-1.27) 0.059
Friend or acquaintance who died from COVID-19	Did not enter the model	Did not enter the model
Family at home with COVID-19	Did not enter the model	Did not enter the model
Family away from home with COVID-19	1.03 (0.94-1.13) 0.483	0.99 (0.86-1.13) 0.832
Close family died from COVID-19	1.20 (1.04-1.38) 0.010	1.28 (1.05-1.58) 0.017
Distant family died of COVID-19	1.06 (0.95-1.19) 0.299	Did not enter the model
Respondent could have COVID-19	1.01 (0.88-1.16) 0.860	1.05 (0.87-1.27) 0.631
Surveyed with confirmed COVID-19	Did not enter the model	1.13 (0.81-1.57) 0.479
With severe depression (DASS-21 test)	1.74 (1.57-1.94) <0.001	2.82 (2.33-3.40) <0.001
With severe anxiety (DASS-21 test)	1.89 (1.68-2.11) <0.001	1.99 (1.63-2.42) <0.001
With severe stress (DASS-21 test)	1.50 (1.34-1.68) <0.001	1.87 (1.54-2.26) <0.001
Country of residence		
Peru	Comparison category	Comparison category
Chile	1.54 (1.39-1.70) <0.001	1.67 (1.44-1.93) <0.001
Mexico	1.07 (0.94-1.22) 0.303	1.00 (0.81-1.24) 0.968
Paraguay	1.45 (1.27-1.66) <0.001	1.48 (1.21-1.80) <0.001
Colombia	1.00 (0.85-1.19) 0.956	1.04 (0.82-1.32) 0.731
Bolivia	1.37 (1.18-1.59) <0.001	1.56 (1.25-1.93) <0.001
Panamá	1.17 (0.96-1.41) 0.112	1.06 (0.77-1.45) 0.727
Ecuador	1.01 (0.83-1.22) 0.937	1.11 (0.86-1.43) 0.410
Costa Rica	1.46 (1.20-1.77) <0.001	1.57 (1.18-2.08) 0.002
El Salvador	1.40 (1.11-1.77) 0.005	1.39 (0.97-2.00) 0.073
Honduras	0.96 (0.71-1.29) 0.763	1.38 (0.93-2.04) 0.111
Guatemala	0.60 (0.35-1.03) 0.066	0.84 (0.43-1.63) 0.605

Relative risks (left), 95% confidence intervals (within parentheses), and p-values (right) were obtained with generalized linear models, with the log link function and models for robust variances.

Discussion

Frequencies of PTSD and severe PTSD were found in up to one in three and one in five respondents, respectively. Despite not being able to extrapolate the results to the rest of the continent, these results are alarming, due to the high number of people with an alteration in the mental health plane, without counting the large percentage who have thought about committing suicide. The findings of PTSD, are approximately equiavalent to that previously reported in other places, this is consistent with a meta-analysis of more than sixty studies published in different circumstances in countries of Europe, Asia, and North America, where a clinically significant prevalence of PTSD of 32% was recorded (Rogers et al. 2020). Furthermore, the findings related to severe PTSD are striking, since even in China, the epicenter of the pandemic; and Italy, one of the countries initially most affected by COVID-19 (Lazzerini and Putoto 2020), a much lower prevalence of PTSD has been determined, and there have been very few cases of severe PTSD (Liu et al. 2020; Forte et al. 2020). The timing of the measurement, access to information about the severity of the virus, and the educational level impacted the results since it is evident that those with a lower level of education have a greater risk of psychological distress (González

Ramírez et al. 2020). All these variables should be studied further as this is a fairly accurate approximation of what has been happening in the Latin American population's mental health arena.

Women were at increased risk for PTSD and severe PTSD, as seen in previous research (Liu et al. 2020; Wang et al. 2020), where it shows that women have been more susceptible to alterations caused by the coronavirus. In parts of Latin America, women are still associated with significant domestic work and taking care of the home and its members, which also increased with the "lockdown" that families had in their homes. Also, women historically have occupied the roles of caregivers of the home, which in some similar situations, translates into symptoms such as insomnia, fatigue, anxiety, stress, and depression. Finally, it is often assumed, in addition to their salaried jobs (Martínez Pizarro 2020), subjected to changes due to the crisis. Finally, cases have been reported of women who, due to the pandemic's effects and measures, were forced to return to live with their domestic partner abusers, further increasing their access to support networks (Lorente-Acosta 2020). What is stated in this paragraph shows the null gender perspective that the general measures of the pandemic have had, which do not usually consider their direct effects on the health of women.

At an older age, there was a lower risk of PTSD and severe PTSD. These results are striking since they are contrasted with other articles that present this age group as one of the highest risk groups. This difference can be explained by concerns about health complications for them and their close family members, along with comorbidities, the decrease in controls for chronic diseases during the pandemic, the infantilization of their decisions in this same context, among others (Lloyd-Sherlock et al. 2020). However, our study results can be further explained because older adults already lived with these daily concernsy and have been able to cope with a series of uncertain events. In addition to this, they tend to have limited access to social networks, considered a protective factor, because they would avoid being affected by news that could cause anxiety, depression, and stress (Mejia et al. 2020). The previous explanation does not mean that this is a group that must be in constant analysis to be able to detect the appearance of alarming symptoms such as isolation, anxiety, excessive worries about the disease, and excessive thinking about death, in addition to other typical signs, which tend to go unnoticed due to the global contingency.

Those respondents who had a romantic partner were at lower risk of developing PTSD in the context of the COVID-19 pandemic. Our results are similar to those found in other studies applied to the general population of China (Cai et al. 2020; Liang et al. 2020), Italy (Rossi et al. 2020), Mexico (González Ramírez et al. 2020) and Spain (González-Sanguino et al. 2020).

The reasons that probably explain this protective effect are real or perceived satisfaction, stability, understanding, attention, support, and emotional security. In turn, this depends on the quality of romantic relationships and communication (virtually or remotely in the first months and in person when the quarantines were lifted), the degree of alliance and commitment of the couple, mutual trust, and well-being generated (Pieh et al. 2020). On the contrary, the marital status of widowed, separated or divorced, have been reported as risk factors for suffering from severe PTSD (Serrano-Ripoll et al. 2020).

Severe stages of anxiety, depression, or stress had a higher risk of having PTSD and severe PTSD, which can be explained because each individual will experience and face the same event differently (Quintana Díaz and Lozano Lesmes 2020). PTSD is a chronic mental illness that generally develops after being exposed to severe trauma, intrusive memories, distressing dreams, and a negative

mood. It is estimated that approximately 6% of people exposed to psychological trauma go on to develop PTSD (Iglesias-Osores et al. 2020); according to this data and other references, it is considered that severe stages of anxiety, depression, or stress are risk factors for having PTSD and severe PTSD. These results are related to gender differences since it has been shown that women with some susceptibilities have a higher risk of suffering from PTSD (Lozano-Vargas 2020).

Residing in different countries generated an increased risk of PTSD or severe PTSD compared to those who lived in Peru, which is the country with the most significant impact worldwide, showing that mental health could be impaired in multiple realities. These outcomes have been shown in studies of the area in different countries across several continents (Marazziti et al. 2020; Thome et al. 2021; Grech and Grech 2020; Tandon 2020; Mukhtar 2020; Ibanez et al. 2020; Llibre-Guerra et al. 2020). For this reason, it is suggested that mental health measurement campaigns be generated in the various settings, as a baseline so that measures can be implemented that facilitate recovery, especially among the populations that are detected that have been the most affected.

The study had the information bias because it was based on the respondents' information, especially those who suffered (or had suspicions) if someone in their environment became ill or died due to COVID-19. It is possible that some cases did not occur, but this issue is not crucial because we wanted to capture the thoughts' and mental effect on respondents. One limitation was a small sample size in some countries, which requires a situational analysis to extrapolate the results. Our objective was to show the reality in a time period related to the significant mortality peaks in each country duing the pandemic.

Conclusion

It is concluded that the percentages of PTSD and PTSD are high in its severe presentation. This risk increased among women if they had a friend or acquaintance who suffered from COVID-19 or a close relative who died from COVID-19. Also, among those who had severe anxiety, depression, or stress and residing in Latin American countries. On the contrary, older age or having a romantic partner reduced the risk of suffering from the disease.

Author Contributions

Conceptualization, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A.; methodology, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A.; software, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A.; validation, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A.; formal analysis, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A.; investigation, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A..; resources, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A.; data curation, C.R.M., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A.; writing—original draft preparation, C.R.M., T.R.A.-R., L.D.G.-T., N.M.D., M.A.V.-E., V.S.-A., S.D.-A.-A., A.A.-R., J.A.Y.; writing—review and editing, C.R.M., N.M.D., T.R.A.-R., L.D.G.-T., M.A.V.-E., V.S.-A., S.D.-A.-A., A.A.-R., J.A.Y.; visualization, C.R.M., T.R.A.-R., N.M.D., L.D.G.-T., M.A.V.-E., V.S.-A., S.D.-A.-A., A.A.-R., J.A.Y.

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Conflict of Interest

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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