Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Cross-cultural validation of the Worries about COVID-19 and its consequences Scale (W-COV) in adolescents and young people

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ABSTRACT

The pandemic context presents remarkable psychological challenges for adolescents and young adults. The aim of the present work was to construct and study the psychometric properties of a scale in Spanish language (W-COV) to measure their worries related to the pandemic. Participants were 5559 people aged between 14 and 25 years old (M = 19.05; SD = 3.28). Self-report data were collected using a cross-sectional and cross-cultural design. Participants were from 5 Spanish-speaking countries. Instruments were W-COV to assess worries about COVID-19 and its consequences; DASS-21 for anxiety, depression and stress; and SWLS for life satisfaction. Exploratory, confirmatory and multi-group factor analyses were conducted to determine the factorial structure of the W-COV and its measurement invariance (configural, metric, scalar and error variance). Correlational and regression analyses were also performed to study convergent and predictive validity. The results suggest that W-COV presents a bifactorial structure: (1) a general factor of worries about COVID-19; and (2) three different factors: worries about health, economic and psychosocial consequences from COVID-19. The internal reliability indices Cronbach's α and Omega were adequate. With respect to the invariance results, the instrument can be used interchangeably in the five countries considered, in both genders and in two different age groups (12–17 and 18–25). Regarding validity, W-COV factors were positively associated with anxiety, depression and stress, and negatively predicted life satisfaction. In conclusion, W-COV is a reliable and valid instrument for researchers and health care professionals to assess the psychological impact of the pandemic on mental health of young Ibero-Americans.

The coronavirus disease (COVID-19) outbreak has had a profound impact worldwide since the World Health Organization (WHO) announced its pandemic status on March 11, 2020 (World Health Organization, 2020). Particularly in Spain, there have been 219 thousand confirmed cases and 25.600 deaths due to COVID-19 at the end of April 2020, being one of the most affected countries in the world by the first wave of the virus (Pastor-Barriuso et al., 2020). Latin America has also been heavily hit by the virus, with severe consequences such as the collapse of sanitary systems and notable economic recession (Lanchimba et al., 2020).

Infectious disease epidemics not only affect the physical health of patients (Brooks et al., 2020). In fact, the European Union remarked not only the need to reduce the number of COVID-19 infected cases, but also the importance of dampen as much as possible the strong impact of the pandemic on mental health (Priesemann et al., 2021). Multiple sources of stress have emerged from the pandemic, such as the immediate health

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threat, job or academic uncertainty, economic concerns, and changes in social routines (Park et al., 2020; Wilson et al., 2020). Consequently, recent studies have highlighted the negative impact of the pandemic on people's mental health, informing of increased levels of anxiety, depression, insomnia, irritability, and alcohol consumption, among others (Justo-Alonso et al., 2020; Rajkumar, 2020).

However, it seems that COVID-19 does not impact the mental health of all people equally, since not everyone is equally concerned about the pandemic. Many people manifest worries about the immediate and long-term consequences of the virus (Panchal et al., 2020). These worries range from getting sick or dying from coronavirus (both oneself and family members) to the potential consequences in sanitary, economic, and psychosocial areas. Although it is natural to be concerned about this critical situation, if such worries become disproportionate in intensity, frequency, or duration, they could interfere with personal functioning, affecting one's emotional state, problem-solving skills, or goal-driven behaviors (Baiano et al., 2020; Bergman et al., 2020; Boyraz et al., 2020; Kämpfen et al., 2020; Moore & Lucas, 2020; Wilson et al., 2020). Thus, the increase in worries may be dysfunctional and counterproductive not only for the individual, but also for the society (Kämpfen et al., 2020). For instance, excessive worry about one's health can lead to inappropriate health care seeking behavior that may add further pressure to the already burdened health care system (Asmundson & Taylor, 2020; Garfin et al., 2020).

The review of literature on worries and COVID-19 revealed that concerns about COVID-19 seem to be related to sleep problems (Grossman et al., 2021), traumatic stress (Boyraz et al., 2020), psychological distress (Moore & Lucas, 2020), anxiety symptoms (Baiano et al., 2020; Bergman et al., 2020; Wilson et al., 2020) and depression symptoms (Kämpfen et al., 2020). In addition, studies suggested that level of worries is related to how people get information about the virus (Ho et al., 2005; Liu, 2020).

Although research on COVID worries has developed strongly in a short time, there are significant gaps in this area. Most of the research has been conducted in general adult population above 18 years old (e. g. Boyraz et al., 2020; Ho et al., 2005; Moore & Lucas, 2020), while only a few studies have been carried out with particularly vulnerable populations (e.g., Maxfield & Pituch, 2020), healthcare workers (e.g., Puci et al., 2020) and people with chronically diseases (e.g., Joensen et al., 2020). There are some recent studies that have examined worries about COVID in adolescents (e.g., Jamieson et al., 2021; Lessard & Puhl, 2021; Vogel et al., 2021) and young people (e.g., Lehmann et al., 2021; Shukla et al., 2021; Yıldırım et al., 2020), stressing that concerns about the pandemic have a considerable impact on the negative affectivity of adolescents and young adults.

In fact, age has been found to be a relevant factor moderating the relationship between concern about COVID-19 and anxiety (Barber & Kim, 2020). According to the literature, older people are more capable of reorienting their emotions and cope with the stress caused by the disease, while young people seem to be especially susceptible to the development of anxiety and depression because of concern about COVID (Schilling & Diehl, 2014; Wilson et al., 2020). Age also seems to be relevant for other issues, such as the risk of contagion, being higher in younger people (Hâncean et al., 2021).

The pandemic context presents remarkable psychological and emotional challenges for adolescents and young adults (Zolopa et al., 2022). Worries related with the possible consequences of a new disease, as well as the limitations of social interactions, particularly influenced young people lives (Brasso et al., 2022). According to the review by Brasso et al. (2022), as a result of the pandemic a considerable number of young people have experienced symptoms of depression, anxiety and distress, post-traumatic stress symptoms, obsessive-compulsive symptoms, eating problems, changes in sleep patterns and substance abuse. Considering that youth is a time when the consolidation of mental disorders can take place, the attention to these sub-clinical symptoms becomes especially important for their prevention (Maxfield & Pituch, 2020).

A relevant question arises from the review of previous research: how are worries about COVID-19 measured in these studies? Indeed, the majority of previous investigations used ad hoc questions (e.g., Barber & Kim, 2020; Kämpfen et al., 2020; Liu, 2020), while other relied on unvalidated adaptations of earlier questionnaires, such as the Penn State Worry Questionnaire (Zysberg & Zisberg, 2020).

However, some studies have developed their own questionnaires to assess COVID-19 worries in populations with specific characteristics, such as Type 1 Diabetes (Joensen et al., 2020; Salah et al., 2021). Furthermore, other new developed scales measure variables closely related to worry, such as fear (FCV-19S; Lin et al., 2021) or adjustment (HACS; Becker et al., 2020). To our knowledge, the only questionnaire that has been developed to measure worry regarding COVID-19 is the new 7-item COVID-19 Worries Scale (CWS; Ahmed et al., 2020; Moore & Lucas, 2020), which assesses the level of concerns regarding being infected or infecting others by COVID-19. The validity of this questionnaire has been replicated in Bangladeshi population and shows adequate psychometric properties (Faisal et al., 2020). However, this instrument measures worries about the disease itself, it does not assess worries about economic or psychosocial consequences of the pandemic.

There are no studies that provide information about people's worries about COVID-19 of the Ibero-American population. Research on COVID-19 related worries has been conducted in North American population (United States and Canada), European population (Italy, Denmark, Sweden), Asian population (Singapore, Bangladesh, Israel), and Australian population. Only one cross-cultural study has been identified (Ammar et al., 2020), carried out on health workers from different countries over the world, although it does not include neither Spanish nor Latino populations.

Therefore, the aim of the present study was to construct and validate an instrument to assess worries about COVID-19 and its sanitary, economic, and psychosocial consequences in adolescent and young population of Ibero-America using a cross-cultural approach. For this purpose, the instrument was tested first in Chilean population, given the large sample size, and its psychometric properties were validated for Colombian, Ecuadorian, Mexican and Spanish population, testing also wheatear the factor structure was equivalent for both men and women across different age groups.

Method

Participants

Regarding total sample, participants were 5559 adolescents and young adults (83.2 % female; 15.6 % male, 1.2 %; non-binary gender) aged between 12 and 25 years (M = 19.05; SD = 3.28). The distribution of participants across countries was as following: 66.5 % of the participants were from Chile, 11.2 % from Colombia, 8.4 % from Ecuador, 5 % from Mexico and 5.6 % from Spain. Table 1 shows sample characteristics for each country. The study included a convenience sample, using a snowball-sampling technique.

Table 1
Sample information for each country.

Country	N	Female (%)	Male (%)	Non-binary (%)	Age *M (SD)*
Chile	3699	87.4 %	10.9 %	1.6 %	19.42 (3.26)
Colombia	621	82.8 %	17.1 %	0.2 %	19.93 (2.69)
Ecuador	558	69.4 %	30.1 %	0.5 %	17.68 (2.74)
México	334	69.8 %	30.2 %	0 %	17.31 (3.69)
Spain	347	74.4 %	25.4 %	0.3 %	17.38(3.11)

The table shows frequencies of participants from each country, their gender and age (mean and standard deviation).

Instruments

Worries about COVID-19 and its consequences

Worries about COVID-19 and its consequences were assessed using the Worries about COVID-19 and its consequences Scale (W-COV), developed in an original Spanish form (Online Resource 1). The scale consists of 16 items with 5-points Likert scale (*1 = Almost never; 5 = Almost always*). This instrument is composed by three factors: (1) *Health worries*: worries about getting sick or dying from COVID (both oneself and/or a family member), quality health care, using hygienic measures properly and lack of information about the virus (5 items; e. g. "*I worry about getting sick or dying from COVID-19*"); (2) *Economic worries*: worries about the economic situation due to COVID-19, not being able to meet basic needs, having product shortages, losing one's job or having to drop out of school (5 items; e. g. "*I am worried that COVID-19 will harm my or my family's economic situation*"); (3) *Psychosocial worries*: worries about the situation of confinement, uncertainty about the consequences of COVID-19, worries about the impact of the pandemic on social relationships, psychological state, and academic/work performance (6 items; e. g. "*I am worried about my psychological state –anxiety, insomnia, irritability, sadness–*").

Psychological distress

Psychological distress was assessed by the short-form version of the Depression Anxiety Stress Scales (DASS-21; Henry & Crawford, 2005; adapted and validated to Spanish by Bados et al., 2005). The scale consists of 21 items with a 4-points Likert scale assessing the symptoms during the last week. This instrument is composed of three factors: depression; anxiety; and stress. The internal consistency of the Spanish version of the instrument is good ($\alpha = 0.84$ for depression; $\alpha = 0.70$ for anxiety; and $\alpha = 0.82$ for stress).

Satisfaction with life

The Satisfaction with Life Scale (SWLS; Diener et al., 1985; Spanish version by Vázquez et al., 2013) was used to assess the individual's overall evaluation of their own life. The 5-item scale, with seven response alternatives, consists of one global dimension calculated by the sum of all items. The internal consistency of the Spanish version of this scale is good ($\alpha = 0.88$).

Procedure

The study was carried out following the guidelines of the Helsinki Declaration and the Council of Europe Convention on Human Rights (World Medical Association, 2013).

The first step of this research consisted of developing the instrument to assess a wide range of public worries about COVID-19 and its consequences on people's life. This instrument was developed according to an expert group formed by four psychologists, who proposed possible areas of concern for adolescents and young adults. From the initial proposal, 16 items were selected to be part of the scale. All items were positively formulated in order to facilitate the easy understanding of the scale.

Data were collected through an online survey on the free software Limesurvey. Following the Checklist for Reporting Results of Internet E-Surveys (CHERRIES; Eysenbach, 2004), we can report some of the most relevant aspects of the online survey used. First, the survey was approved by the university's ethics committee. Data were collected from May to August 2020, during the first wave of COVID. Before answering the survey, participants were informed about the objective of the study and consented their participation. The survey did not ask about personal data. This was an open survey, available to all those who wished to answer voluntarily, so the sample used was one of convenience. The survey was disseminated through the website and social networks of the research teams, as well as among educational centers which had previous contact with researchers. There was no incentive for participation. Participants could access the survey from their own mobile or computer devices from home, and the time expected for complete the survey was approximately 15 min.

Data analysis

First, we conducted an Exploratory Factor Analysis (EFA) to determine the factorial structure of the W-COV. FACTOR software (version 10.5.01) was used to perform the EFA (Lorenzo-Seva & Ferrando, 2013). The main advantage of FACTOR in comparison to other statistical software is the possibility of performing the EFA on the basis of the tetrachoric/polychoric correlation matrix; this option is preferable when modeling dichotomous and/or ordinal data (such as in the case of the W-COV; Ferrando & Lorenzo-Seva, 2017). To determine the number of factors to be retained during the EFA, we used Parallel Analysis (PA). To verify the applicability of the EFA to the W-COV, we estimated the Kaiser–Meyer–Olkin (KMO) index and the Bartlett sphericity test. According to these indices, an EFA is applicable when the KMO is >0.80 and the significance of the Barlett's test of sphericity is $p < .05$. Once confirmed its applicability, factors were extracted through Robust Unweighted Least Squares (RULS) and applying an oblique rotation (direct oblimin). All these analyses were conducted on the basis of the polychoric correlation matrix. Due to the large sample size, the EFA was conducted using the Chilean sample. To do so, the Chilean sample ($n = 3699$) was divided into two random samples equally distributed in number of participants: the first Chilean subsample (validation sample, $n = 1849$) was used to perform the EFA, whereas the second subsample (confirmation sample, $n = 1840$) was used to confirm the initial factorial structure through CFA.

To examine the adequacy of fit of the factor model derived from the EFA, confirmatory factor analyses (CFAs) were then conducted for each country, as well as for the overall sample. These analyses were conducted through EQS 6.4 (Bentler, 2006). As factorial models derived from an EFA admit different factorial structures (e.g., a three-factor model derived from an EFA may be structured as three correlated factors, three factors under a second order factor, or both [bifactor]), we compared the fit of different factorial solutions. Non-normal distribution of categorical data was addressed by applying robust estimation methods (robust Maximum Likelihood, MLR; Finney & DiStefano, 2013). In line with best practice in Structural Equation Modeling (Hooper et al., 2008; Kline, 2013) and to ensure the comparability between countries, we did not apply any modification to the models based on modification indices, even when minor changes (e.g., correlations between error terms) significantly increased the models' fit. Goodness of fit for the CFA models was assessed through the following indices: the root mean square error of approximation (RMSEA), the comparative and incremental fit indices (CFI and IFI, respectively), and the standardized root mean square residual (SRMR). An excellent model fit was identified when the CFI and the IFI were ≥0.95, the RMSEA ≤0.05, and the SRMR ≤0.05 (Bagozzi & Yi, 2011; Schermelleh-Engel & Müller, 2003). Using less restrictive criteria, values ≥0.90 for the CFI and the IFI, ≤0.08 for the RMSEA, and ≤0.10 for the SRMR were considered acceptable (Hooper et al., 2008). For the sake of transparency, Satorra-Bentler chi-square (X^2), general model significance (p), and relative chi-square (X^2/df) were reported; however, given that X^2 is highly sensitive to sample size (Jöreskog & Sörbom, 1993; Markland, 2007), which in our study far exceeds the standards required for conducting this type of analysis (Hair et al., 2010), these indices were not employed to assess the adequacy of the CFA models.

To assess whether the factor structure of the W-COV were valid for their use across different ages (adolescents vs. young adults), countries (Spain, Chile, Mexico, Ecuador, and Colombia), and in both genders (male vs. females), multi-group CFAs were conducted. Specifically, we tested four levels of measurement invariance: (1) configural (test whether items load on the same factor across groups), (2) metric (test whether item factorial loadings are equal across groups), (3) scalar (test

whether item intercepts are equal across groups) and (4) error variance invariance (test whether items measurement error are equal across groups). The adequacy of the increasingly constrained models was assessed through the difference between pairs of nested models (Δ) in the RMSEA, CFI and SRMR. A change ≥0.01 in the CFI, ≥0.015 in the RMSEA, and ≥0.03 in the SRMR indicates a significant decrease in the model fit when testing for measurement invariance (Chen, 2007).

Finally, the general mean score of the items, subscales, and total score of the W-COV were explored, as well as the magnitude of the differences according to the age, gender, and country. Different reliability indices were calculated; in particular, we estimated the Cronbach's α and Omega (Ω). Convergent validity was explored by correlating (Pearson's *r*) the W-COV subscales with other related measures (DASS-21). Finally, multiple regressions analysis was performed to determine the predictive power of the W-COV over life satisfaction (SWLS).

Results

Exploratory Factor Analysis (EFA)

The EFA was conducted using the Chilean validation sample (n = 1849). To verify the applicability of the EFA to the W-COV, the Kaiser–Meyer–Olkin index (KMO = 0.855) and the Bartlett's sphericity test ($\chi^2_{120} = 7520.5$, $p \leq .001$) were calculated. Both indices indicated that the W-COV admitted a factorial solution. PA suggested to retain three factors (factor eigenvalues >1.34). The factorial solution derived from the RULS factor analysis revealed that this three-factor structure explained 53 % of the total variance of the W-COV. Table 2 includes the standardized factor loadings obtained in the EFA.

Factor I ("Health worries"), which was composed of 5 items (items 1, 2, 3, 4, and 13) and had an eigenvalue of 5.37, explained a 33.56 % of the W-COV variance. Items within this factor reflect fears related to the health consequences derived from the COVID pandemic. Factor II, called "Economic Worries", comprised 5 items (items 5 to 9) assessing worries related to the economic impact of the COVID pandemic (eigenvalue = 1.78; explained variance of 11.13 %). Factor III ("Psychosocial Worries") integrated the other 6 items (items 10 to 16) and had an eigenvalue of 1.34 and an explained variance of 8.36 %. This factor comprises questions about the social and psychological impact of the pandemic.

Confirmatory Factorial Analysis (CFA) and measurement invariance

To determine the most suitable factorial structure behind the three-factor solution, we performed a CFA comparing three different models: (a) a model in which the three first-order factors derived from the EFA were correlated; (b) a model in which the three first-order factors were grouped under a second order factor (i.e., an higher order factor depicting a general COVID-worries dimension); and (3) a bifactor model comprising a non-hierarchical COVID-worries dimension in addition to the three specific factors. The adequacy of the proposed models was tested using the Chilean confirmation sample (n = 1850). Table 3 shows goodness-of-fit indices for the different models.

The factorial solution with the most satisfactory fit indices was the bifactor model. In this model, the RMSEA was <0.08 (figure required to consider a model acceptable), the CFI and the IFI reached a value of 0.918 and 0.919 respectively (close to the cut-off point established to consider that a model reaches an excellent fit), and the SRMR was 0.041 (below the 0.05 value required by the strictest criteria to consider a model parsimonious). The resulting bifactorial model is depicted in the Fig. 1.

Then, we verified the applicability of the bifactorial solution to samples from the other countries. As displayed in Table 3, the RMSEA and the SRMR were below the thresholds of 0.08 and 0.10 in all the country-based datasets as well as in the whole sample. Furthermore, in all the datasets, the CFI and the IFI were above –or close to– the threshold of 0.90 to consider a model parsimonious. The best adjustment according to these indices was obtained for the sample from Ecuador (RMSEA = 0.046; SRMR = 0.037; CFI = 0.952; IFI = 0.952).

Finally, to test measurement invariance of the W-COV according to gender, age, and country, we conducted a series of multi-group CFAs. As displayed in Table 4, gender, age, and country configural invariance of

Table 2
W-COV factorial loadings.

	EFA on the Chilean subsample (Validation subsample, n = 1849)			CFA on each country[a]				
	F1	F2	F3	Chile[b] (n = 1850)	Colombia (n = 621)	Ecuador (n = 558)	Mexico (n = 334)	Spain (n = 347)
Factor 1: health worries								
Item 1	0.80			0.72	0.76	0.43	0.58	0.80
Item 2	0.76			0.46	0.54	0.40	0.55	0.54
Item 3	0.38			0.17	0.28	0.26	0.28	0.25
Item 4	0.32			0.25	0.25	0.25	0.18	0.27
Item 13	0.28			0.08	0.09	0.02	0.11	0.09
Factor 2: economic worries								
Item 5		0.89		0.64	0.70	0.58	0.50	0.95
Item 6		0.82		0.61	0.47	0.36	0.56	0.29
Item 7		0.31		0.02	0.13	0.06	0.06	0.02
Item 8		0.43		0.13	0.12	0.21	0.18	0.26
Item 9		0.52		0.24	0.38	0.24	0.18	0.13
Factor 3: psychosocial worries								
Item 10			0.63	0.49	0.50	0.22	0.27	0.39
Item 11			0.69	0.63	0.62	0.72	0.58	0.66
Item 12			0.69	0.53	0.45	0.39	0.44	0.45
Item 14			0.53	0.32	0.30	0.20	0.25	0.05
Item 15			0.64	0.40	0.55	0.34	0.48	0.28
Item 16			0.42	0.26	0.28	0.19	0.31	0.18

The table shows the factor loadings of W-COV items in both exploratory (performed only with Chilean sample) and confirmatory analysis (with five different countries). Items were presented according the three main factors of the scale (worries about health, economic and psychosocial consequences of COVID-19).

[a] Factorial loadings from the AFC included in this table correspond to those obtained in the bifactor model (in particular, to factorial loadings of each item on a specific factor). As the bifactor model also includes a relationship between each item and a general dimension (i.e., items' variance is shared by a specific COVID-worry factor and a general COVID-worry dimension), these figures are not comparable to those obtained in the EFA.

[b] These figures correspond to the CFA conducted in the Chilean confirmation subsample.

Table 3
Results from the CFA.

	n	χ^2	*df*	*p*	χ^2/df	RMSEA (CI)	CFI	IFI	SRMR
Step 1: comparison of different factorial solutions (Chilean confirmation sample)									
Three correlated 1st order factors	1850	1050.47	101	<.001	10.40	0.071 (0.067;0.075)	0.861	0.862	0.062
Three 1st order factors under a 2nd order factor	1850	1028.62	100	<.001	10.28	0.071 (0.067;0.075)	0.864	0.865	0.062
Bifactor model	1850	646.21	88	<.001	5.27	0.059 (0.054;0.063)	0.918	0.919	0.041
Step 2: goodness of fit of the bifactor model in the different study samples									
Colombia	621	300.99	88	<.001	3.42	0.062 (0.055;0.070)	0.921	0.921	0.047
Ecuador	558	191.32	88	<.001	2.17	0.046 (0.037;0.055)	0.952	0.952	0.037
Mexico	334	233.65	88	<.001	2.65	0.071 (0.059;0.081)	0.910	0.912	0.053
Spain	347	233.18	88	<.001	2.64	0.069 (0.058;0.080)	0.892	0.894	0.056
All countries	5559	1767.62	88	<.001	20.08	0.059 (0.056;0.061)	0.925	0.925	0.037

Note. CFA = confirmatory factor analysis; χ^2 = Satorra-Bentler chi-square; *df* = degrees of freedom; *p* = general model significance; χ^2/df = normed chi-square; RMSEA = root mean square error of approximation; CFI = comparative fit index; IFI = incremental fit index; SRMR = standardized root mean square residual.
The table shows, in the first place (Step 1), the fit indices obtained for the three factorial models tested in the Chilean sample. Being the bifactorial model the one with the best fit, secondly (Step 2), the fit indices of the bifactorial model are compared for the other countries.

the W-COV was fully supported (RMSEA = 0.058; CFI = 0.925; SRMR = 0.038 [according to gender]; RMSEA = 0.061; CFI = 0.920; SRMR = 0.039 [according to age]; RMSEA = 0.060; ΔCFI = 0.920; ΔSRMR = 0.048 [according to country]), so we subsequently estimated models with increasing levels of constraints to test higher levels of invariance. Regarding metric invariance, changes in the RMSEA, CFI, and SRMR did not show a significant worsening in the model fit neither for gender (ΔRMSEA = 0.003; ΔCFI = 0.004; ΔSRMR = 0.010) nor for age (ΔRMSEA = 0.005; ΔCFI = 0.006; ΔSRMR = 0.006), or country invariance (ΔRMSEA = 0.003; ΔCFI = 0.011; ΔSRMR = 0.015). Similarly, the models' fit did not significantly decrease when subsequent levels of age invariance were tested (Δ in CFI, RMSEA, and SRMR were always below 0.010, 0.015 and 0.03, respectively), thus supporting a complete equivalence of the W-COV in adolescents and young adults. Scalar invariance according to gender was also fully supported (ΔRMSEA = 0.005; ΔCFI = 0.006; ΔSRMR = 0.024). However, the significant Δ in SRMR when scalar invariance according to country was tested (0.045) or when error invariance according to gender and country was tested (0.032 and 0.056 respectively) suggested the presence of differences at these levels of measurement according to gender and country.

Descriptive statistics and reliability

Reliability analysis showed an adequate internal consistency for all three dimensions in the five countries studied (Table 5). The instrument's Cronbach's alpha did not increase with the removal of any of the items, which indicates that all of them contribute positively to the internal consistency of the scale.

Levels of worries about COVID-19 and their consequences are similar among adolescents (aged 12–17 years) and the young adults (aged 18–25 years) (Fig. 1). In general, worries are moderate-high, scoring above 3 on a scale ranged from 1 to 5.

Validity analyses

Convergent validity was studied, comparing the square root of the AVE from W-COV dimensions (health worries, economic worries, and psychosocial worries) with values from correlations between pairs of factors, indicating adequate indexes. In addition, the trifactorial structure of the scale shows that factor loads were high and significant among cross-cultural samples (Table 2); that is, scale factors strongly correlate with the latent variable to be evaluated, worries about COVID-19 and its consequences. Furthermore, Pearson's correlations were conducted to compare the W-COV with another instrument (DASS-21) measuring emotional distress (symptoms of depression, anxiety, and stress).

The results showed that high levels of health, economic and psychosocial worries are significantly and positively correlated with symptoms of depression ($r = 0.22, r = 30, r = 0.51, p < .001$), anxiety ($r = 0.30, r = 30, r = 0.48, p < .001$) and stress ($r = 0.29, r = 31, r = 0.56, p < .001$), showing the most strongly correlations with psychosocial worries.

Multiple regression was conducted to analyse predictive validity. The results indicated that all dimensions of W-COV were significant predictors of life satisfaction explaining 11 % of its variance ($R^2 = 0.11$). Health worries were positively associated with life satisfaction (ß = 0.10, $p < .001$), while economic (ß = −0.16, $p < .001$) and psychosocial worries (ß = −0.28, $p < .001$) were negatively related to life satisfaction.

Discussion

Since the coronavirus disease (COVID-19) has been declared a global pandemic by the WHO in March 2020, it has become one of the most important health problems all around the world. It is hard to predict the course that this current health crisis is going to take and to what extend it will affect young people's future well-being and health. Therefore, reliable and valid assessment tools are needed to investigate the effects of COVID-19 on youth's mental health across different Ibero-American countries, allowing a valuable insight into the perception of the coronavirus and its consequences in such a vulnerable population.

The aim of the present study was to examine the psychometric properties of the Worries about COVID-19 and its consequences Scale (W-COV) by analysing its factor structure and measurement invariance in adolescents and young people across five countries, including Chile, Colombia, Ecuador, Mexico and Spain, testing also wheatear the factor structure was equivalent for both men and women across different age groups. The proposed three-factor structure of the W-COV with factors assessing health, economic, and psychosocial consequences, was confirmed across all five Ibero-American countries. These results indicate that the W-COV measures worries about COVID-19 and its consequences in the same way across the five countries. The scale also has shown good internal consistency, with reliability indexes similar across

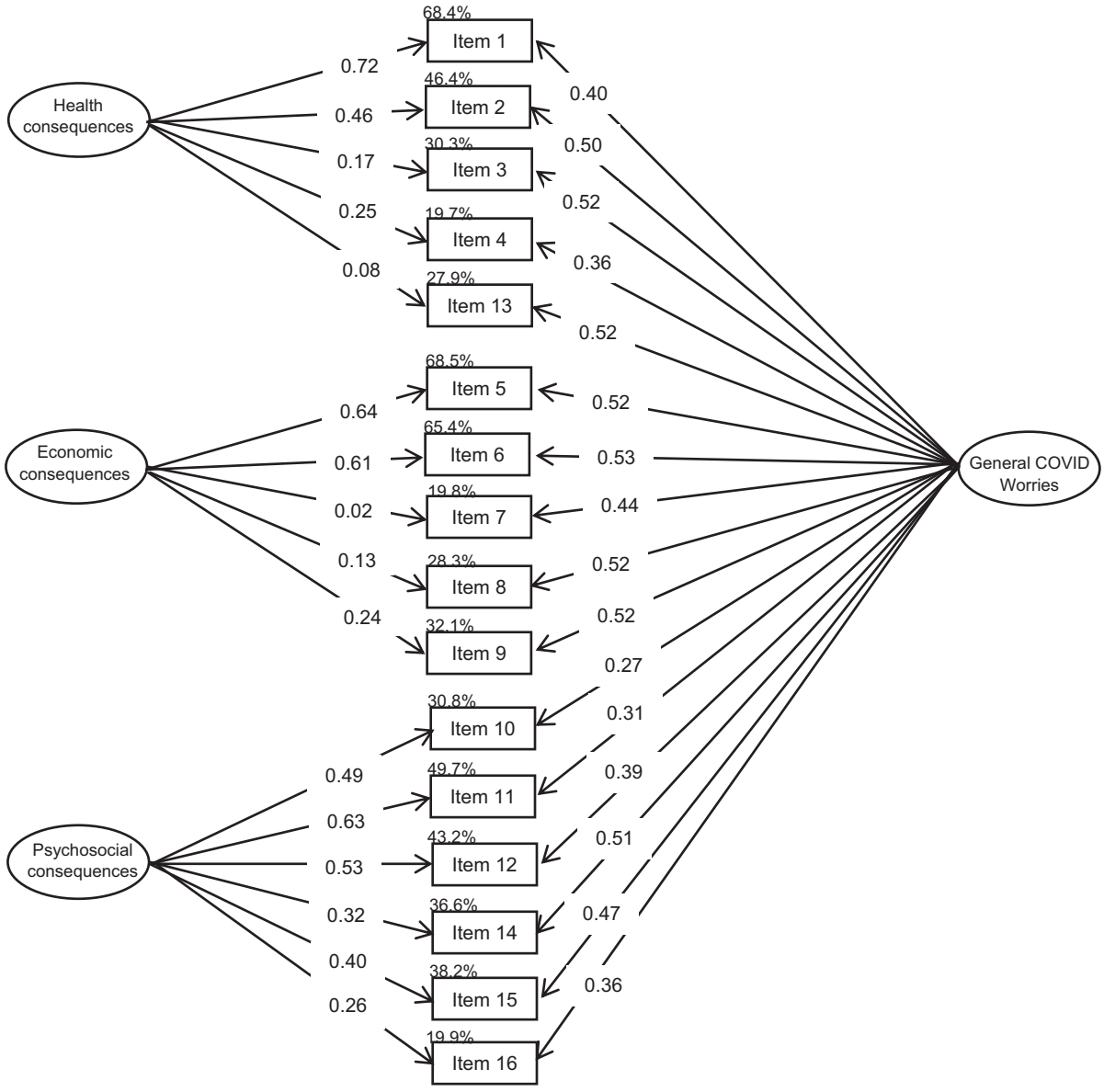

Fig. 1. Bifactor model for the W-COV. R^2 is expressed as a percentage outside the main endogenous variables' boxes. Coefficients are reported in standardized format. All parameters were significant at $p < .001$. Error terms are not included in order to facilitate interpretation.

the cross-cultural samples. In addition, overall measurement invariance according to gender and across age groups was supported for both, thus implying that, male and female adolescents and young adults interpreted the W-COV items in a conceptually similar manner.

Furthermore, the results indicate that the W-COV meets the criteria for convergent and predictive validity: 1) W-COV was positively related to symptoms of depression, anxiety and stress; 2) predicted subjective well-being. The convergent validity was analysed to provide evidence of construct validity. First, the 16 items of the W-COV correlate significantly and highly with the latent variable they intend to evaluate. The intercorrelations between the three factors of the W-COV have adequate values. Second, the results confirm the relationship between the emotional distress (DASS-21) and COVID-19 related worries (W-COV), demonstrating that the dimensions of both scales measure similar but different concepts. These results provide evidence that W-COV is a valid measure of worries about COVID-19 and its consequences.

The predictive validity of the instrument was determined by performing multiple regression analysis between COVID-19 related worries (W-COV) and life satisfaction, an indicator of subjective well-being. All dimensions of the W-COV are significant predictors of life satisfaction, with psychosocial worries being the dimension with the strongest association. Although health worries were positively related to life satisfaction, the relationship with economic and psychosocial worries was negative. These findings are consistent with a recent study that suggests a negative impact of fear of COVID-19 on life satisfaction (Satici et al., 2020).

Limitations of the present study

Our study has some limitations worth noting. First, the findings of this study were based on self-report data through online measure, which makes the data collection process more accessible and widespread, but also increase the risk of invalid data and source bias. Future research might use a multimethod approach (combining qualitative and quantitative methods) and/or multirater (parents and peers) designs to improve the validity of our findings. Second, although more than one reliability analyses were carried out, the test-retest reliability of the scale cannot be examined given the cross-sectional design.

Table 4
Multigroup CFAs according to gender, age, and country.

	χ^2	*df*	*p*	χ^2/df	RMSEA (CI)	CFI	IFI	SRMR	Comparisons	ΔRMSEA	ΔCFI	ΔSRMR
Measurement invariance according to gender												
Configural invariance	1802.89	176	<.001	10.24	0.058 (0.056;0.060)	0.925	0.925	0.038	NA			
Metric invariance	1920.27	204	<.001	9.41	0.055 (0.053;0.058)	0.921	0.921	0.048	Conf. Vs Metric	0.003	0.004	0.010
Scalar invariance	2392.59	220	<.001	10.87	0.060 (0.058;0.062)	0.926	0.927	0.072	Metric Vs Scalar	0.005	0.006	0.024
Error variance invariance	1797.35	192	<.001	9.35	0.055 (0.053;0.058)	0.923	0.923	0.040	Scalar Vs Error	0.005	0.003	0.032
Measurement invariance according to age												
Configural invariance	1997.06	176	<.001	11.34	0.061 (0.059;0.063)	0.920	0.921	0.039	NA			
Metric invariance	2154.94	204	<.001	10.56	0.059 (0.056;0.061)	0.915	0.915	0.045	Conf. Vs Metric	0.005	0.006	0.006
Scalar invariance	2585.25	220	<.001	11.75	0.059 (0.057; 0.062)	0.916	0.916	0.046	Metric Vs Scalar	0.000	0.001	0.001
Error variance invariance	2220.93	192	<.001	11.56	0.062 (0.059; 0.064)	0.912	0.912	0.043	Scalar Vs Error	0.003	0.004	0.003
Measurement invariance according to country												
Configural invariance	1614.49	440	<.001	3.66	0.060 (0.057; 0.063)	0.920	0.921	0.048	NA			
Metric invariance	1878.41	552	<.001	3.40	0.057 (0.054; 0.060)	0.910	0.910	0.063	Conf. Vs Metric	0.003	0.011	0.015
Scalar invariance	3631.68	616	<.001	5.89	0.062 (0.059; 0.064)	0.918	0.918	0.108	Metric Vs Scalar	0.005	0.005	0.045
Error variance invariance	1791.64	504	<.001	3.55	0.059 (0.056; 0.062)	0.916	0.917	0.052	Scalar Vs Error	0.003	0.002	0.056

Note. CFA = confirmatory factor analysis; χ^2 = Satorra-Bentler chi-square; *df* = degrees of freedom; *p* = general model significance; χ^2/df = normed chi-square; RMSEA = root mean square error of approximation; CFI = comparative fit index; IFI = incremental fit index; SRMR = standardized root mean square residual; Δ RMSEA = change in RMSEA compared with the previous model (expressed in absolute values); Δ CFI = change in CFI compared with the previous model (expressed in absolute values); Δ SRMR = change in SRMR compared with the previous model (expressed in absolute values).
The table shows the four levels tested of measuring invariance (configural, metric, scalar and error variance) to observe if model fit indices remain similar in participants of different gender, country or age group (adolescents aged 12–17 or young adults aged 18–25). For ease of comparison, the increase in the indexes is also showed.

Table 5
Descriptive statistics, internal consistency indexes and test-retest correlations.

	M (SD)			Asymmetry	Kurtosis	α	ω
	Entire sample	Women	Men				
Chile	(N = 3699)	(*n* = 3234)	(*n* = 404)			**0.83**	**0.83**
Health-W	3.32 (0.79)	3.36 (0.78)	3.06 (0.86)	−0.31	−0.21	0.689	0.686
Economic-W	3.24 (0.89)	3.27 (0.88)	2.99 (0.91)	−0.05	−0.63	0.743	0.748
Psychosocial-W	3.52 (0.86)	3.55 (0.84)	3.24 (0.96)	−0.37	−0.39	0.739	0.744
Colombia	(N = 621)	(*n* = 514)	(*n* = 106)			**0.85**	**0.85**
Health-W	2.95 (0.82)	3.00 (0.81)	2.69 (0.82)	−0.01	−0.23	0.713	0.709
Economic-W	3.10 (0.89)	3.12 (0.89)	2.97 (0.88)	0.10	−0.61	0.776	0.795
Psychosocial-W	3.07 (0.91)	3.15 (0.90)	2.67 (0.85)	0.03	−0.60	0.769	0.774
Ecuador	(N = 558)	(*n* = 387)	(*n* = 168)			**0.86**	**0.86**
Health-W	3.11 (0.86)	3.23 (0.87)	2.83 (0.79)	0.02	−0.42	0.704	0.705
Economic-W	3.33 (0.92)	3.49 (0.86)	2.94 (0.93)	−0.09	−0.73	0.771	0.782
Psychosocial-W	3.01 (0.88)	3.14 (0.86)	2.72 (0.87)	−0.05	−0.65	0.736	0.740
Mexico	(N = 334)	(*n* = 233)	(*n* = 101)			**0.88**	**0.88**
Health-W	3.13 (0.91)	3.28 (0.86)	2.81 (0.93)	−0.08	−0.48	0.758	0.751
Economic-W	3.07 (0.95)	3.16 (0.88)	2.86 (1.08)	0.16	−0.74	0.797	0.789
Psychosocial-W	3.00 (0.94)	3.11 (0.92)	2.71 (0.97)	0.07	−0.77	0.782	0.769
Spain	(N = 347)	(*n* = 258)	(*n* = 88)			**0.84**	**0.84**
Health-W	2.83 (0.82)	2.96 (0.81)	2.46 (0.84)	0.14	−0.50	0.714	0.712
Economic-W	2.52 (0.78)	2.63 (0.76)	2.21 (0.74)	0.46	0.02	0.676	0.684
Psychosocial-W	2.80(0.88)	2.97 (0.85)	2.32 (0.80)	0.20	−0.58	0.748	0.756

Note. 61 people identified themselves with the gender "Other" (non-binary) in Chile, 1 in Colombia, 3 in Ecuador and 1 in Spain. ** $p < .001$.
The table shows descriptive data of the participants from the five countries. In addition, two internal consistency indices (α and ω) of the W-COV factors are observed for each country.
Indices for the total scale are shown in bold.

Therefore, future studies might consider a longitudinal design in order to gather information regarding the temporal reliability of the scale. Third, another problematic issue of the study concerns the convenience sampling of participants, which resulted in a disproportional share of female participants, thus limiting generalizability of our results. Samples from some of the countries were relatively small and should be enhanced in future studies, both in terms of their size and heterogeneity, for more robust conclusions. Finally, although our results indicate that the W-COV scores can be meaningfully compared across Ibero-American countries, only one European country was included in the present study. Future studies should examine measurement invariance of the W-COV in other European samples as well.

Conclusions

Overall, our findings indicate that the Worries about COVID-19 and its consequences Scale (W-COV) is a valid and reliable self-report measurement of how adolescents and young adults from different Ibero-American countries perceive the coronavirus and its consequences. Thus, this novel questionnaire can serve as a suitable tool for researchers and health care professionals to assess the psychological impacts of COVID-19 on especially vulnerable individuals during adolescence and youth. Additionally, this cross-cultural approach allows the comparison between results from studies conducted in different cultures and countries, expanding scientific knowledge internationally.

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Data availability statement

The datasets generated and analysed during the current study are not publicly available due to the fact that they constitute an excerpt of research in progress but are available from the corresponding author on reasonable request.

CRediT authorship contribution statement

All the authors equally contributed to the study design, participants' recruitment, data collection, analysis/interpretation of data, and writing up the study and the paper. All the authors read and approved the final version of the manuscript.

Informed consent

The Ethics Committee of Research in Humans of the Ethics Commission in Experimental Research of the University of Valencia approved study consent, procedures and research protocol (Reference number: 1595575567385, July 23th 2020). Before accessing the survey, participants gave their informed consent to participate in the study.

Declaration of competing interest

The authors declare no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.apnu.2022.07.016.

References

Ahmed, O., Zahir Ahmed, M., Md Abu Hena Mostafa Alim, S., Arif Uddin Khan, M. D., & Jobe, M. C. (2020). COVID-19 outbreak in Bangladesh and associated psychological problems: An online survey. *Death Studies*, 1–10. https://doi.org/10.1080/07481187.2020.1818884

Ammar, N., Aly, N. M., Folayan, M. O., Khader, Y., Virtanen, J. I., Al-Batayneh, O. B.El Tantawi, M., … (2020). Behavior changes due to COVID-19 among dental academics—The theory of planned behavior: Stresses, worries, training, and pandemic severity. *PLoS One, 15*(9). https://doi.org/10.1371/journal.pone.0239961

Asmundson, G. J., & Taylor, S. (2020). How health anxiety influences responses to viral outbreaks like COVID-19: What all decision-makers, health authorities, and health care professionals need to know. *Journal of Anxiety Disorders, 71*. https://10.1016/j.janxdis.2020.102211.

Bados, A., Solanas, A., & Andrés, R. (2005). Psychometric properties of the Spanish version of depression, anxiety and stress scales (DASS). *Psicothema, 17*(4), 679–683.

Bagozzi, R. P., & Yi, Y. (2011). Specification, evaluation, and interpretation of structural equation models. *Journal of the Academy of Marketing Science, 40*(1), 8–34. https://doi.org/10.1007/s11747-011-0278-x

Baiano, C., Zappullo, I., & Conson, M. (2020). Tendency to worry and fear of mental health during Italy's COVID-19 lockdown. *International Journal of Environmental Research and Public Health, 17*(16), 5928–5936. https://doi.org/10.3390/ijerph17165928

Barber, S. J., & Kim, H. (2020). COVID-19 worries and behavior changes in older and younger men and women. *The Journals of Gerontology, 76*(2), 17–23. https://doi.org/10.1093/geronb/gbaa068

Becker, S. P., Quach, J. L., Dvorsky, M. R., Breaux, R., Melvin, G. A., & Sciberras, E. (2020). Home adjustment to COVID-19 scale (HACS). https://osf.io/mpcjs.

Bentler, P. M. (2006). *EQS structural equations program manual*. Multivariate Software.

Bergman, Y. S., Cohen-Fridel, S., Shrira, A., Bodner, E., & Palgi, Y. (2020). COVID-19 health worries and anxietysymptoms among older adults: The moderating role of ageism. *International Psychogeriatrics, 1–5*. https://doi.org/10.1017/S1041610220001258

Boyraz, G., Legros, D. N., & Tigershtrom, A. (2020). COVID-19 and traumatic stress: The role of perceived vulnerability, COVID-19-related worries, and social isolation. *Journal of Anxiety Disorders, 76*, 1–9. https://doi.org/10.1016/j.janxdis.2020.102307

Brasso, C., Bellino, S., Blua, C., Bozzatello, P., & Rocca, P. (2022). The impact of SARS-CoV-2 infection on youth mental health: A narrative review. *Biomedicines, 10*(4), 772. https://doi.org/10.3390/biomedicines10040772

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet, 395*(10227), 912–920. https://doi.org/10.1016/s0140-6736(20)30460-8

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(3), 464–504. https://doi.org/10.1080/10705510701301834

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13

Eysenbach, G. (2004). Improving the quality of web surveys: The checklist for reporting results of internet E-surveys (CHERRIES). *Journal of Medical Internet Research, 6*(3), Article e132.

Faisal, R. A., Jobe, M. C., Ahmed, O., & Sharker, T. (2020). Replication analysis of the COVID-19 worry scale. *Death Studies, 1–7*. https://doi.org/10.1080/07481187.2020.1815104

Ferrando, P. J., & Lorenzo-Seva, U. (2017). 10 años del programa FACTOR: Una revisión crítica de sus orígenes, desarrollo y líneas futuras. *Psicothema, 29*(2), 236–240. https://doi.org/10.7334/psicothema2016.304

Finney, S. J., & DiStefano, C. (2013). Nonnormal and categorical data in structural equation models. In *Structural equation modeling: A second course* (2nd Editio, p. 703). Information Age Publishing.

Garfin, D. R., Silver, R. C., & Holman, E. A. (2020). The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. *Health Psychology, 39*(5), 335–338. https://doi.org/10.1037/hea0000875

Grossman, E. S., Hoffman, Y. S., Palgi, Y., & Shrira, A. (2021). COVID-19 related loneliness and sleep problems in older adults: Worries and resilience as potential moderators. *Personality and Individual Differences, 168*, Article 110371. https://doi.org/10.1016/j.paid.2020.110371

Hair, J. F., Black, W. C., & Babin, B. J. (2010). *Multivariate data analysis: A global perspective*. Pearson.

Hâncean, M. G., Lerner, J., Perc, M., Ghiță, M. C., Bunaciu, D. A., Stoica, A. A., & Mihăilă, B. E. (2021). The role of age in the spreading of COVID-19 across a social network in Bucharest. *Journal of complexNetworks, 9*(4), cnab026. https://doi.org/10.1093/comnet/cnab026

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the depression anxiety stress scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology, 44*(2), 227–239. https://doi.org/10.1348/014466505x29657

Ho, S. M. Y., Kwong-Lo, R. S. Y., Mak, C. W. Y., & Wong, J. S. (2005). Fear of severe acute respiratory syndrome (SARS) among health care workers. *Journal of Consulting and Clinical Psychology, 73*(2), 344–349. https://doi.org/10.1037/0022-006X.73.2.344

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modeling: Guidelines for determining model fit. *Electronic Journal on Business Research Methods, 6*(1), 53–60.

Jamieson, D., Kannis-Dymand, L., Beaudequin, D. A., Schwenn, P., Shan, Z., McLoughlin, L. T.Hermens, D. F., … (2021). Can measures of sleep quality or white matter structural integrity predict level of worry or rumination in adolescents facing stressful situations? Lessons from the COVID-19 pandemic. *Journal of Adolescence, 91*, 110–118.

Joensen, L. E., Madsen, K. P., Holm, L., Nielsen, K. A., Rod, M. H., Petersen, A. A. Willaing, I., … (2020). Diabetes and COVID-19: Psychosocial consequences of the COVID-19 pandemic in people with diabetes in Denmark—what characterizes people with high levels of COVID-19-related worries? *Diabetic Medicine, 37*(7), 1146–1154. https://doi.org/10.1111/dme.14319

Jöreskog, K., & Sörbom, D. (1993). *LISREL 8: Structural Equation Modeling With the SIMPLIS Command Language*. Scientific Software International Inc.

Justo-Alonso, A., García-Dantas, A., González-Vázquez, A. I., Sánchez-Martín, M., & del Río-Casanova, L. (2020). How did different generations cope with the COVID-19 pandemic? Early stages of the pandemic in Spain. *Psicothema, 32*(4), 490–500. https://doi.org/10.7334/psicothema2020.168

Kämpfen, F., Kohler, I. V., Ciancio, A., Bruine de Bruin, W., Maurer, J., & Kohler, H. P. (2020). Predictors of mental health during the Covid-19 pandemic in the US: Role of economic concerns, health worries and social distancing. *PLoS One, 15*(11), 1–13. https://doi.org/10.1371/journal.pone.0241895

Kline, R. (2013). Exploratory and confirmatory factor analysis. In Y. Petscher, C. Schatschneider, & D. L. Compton (Eds.), *Applied quantitative analysis in education and the social sciences* (pp. 171–207). Routledge.

Lanchimba, C., Bonilla-Bolaños, A., & Díaz-Sánchez, J. P. (2020). The COVID-19 pandemic: Theoretical scenarios of its socioeconomic impacts in Latin America and the Caribbean. *Brazilian Journal of Political Economy, 40*(4), 622–646. https://doi.org/10.1590/0101-31572020-3199

Lehmann, S., Skogen, J. C., Haug, E., Mæland, S., Fadnes, L. T., Sandal, G. M.Bjørknes, R., … (2021). Perceived consequences and worries among youth in Norway during the COVID-19 pandemic lockdown. *Scandinavian Journal of Public Health*. https://doi.org/10.1177/1403494821993714

Lessard, L. M., & Puhl, R. M. (2021). Adolescent academic worries amid COVID-19 and perspectives on pandemic-related changes in teacher and peer relations. *School Psychology, 36*(5), 285–292. https://doi.org/10.1037/spq0000443

Lin, C. Y., Hou, W. L., Mamun, M. A., Aparecido da Silva, J., Broche-Pérez, Y., Ullah, I. Pakpour, A. H., … (2021). Fear of COVID-19 scale (FCV-19S) across countries: Measurement invariance issues. *Nursing Open, 8*(4), 1892–1908.

Liu, P. L. (2020). COVID-19 information seeking on digital media and preventive behaviors: The mediation role of worry. *Cyberpsychology, Behavior, and Social Networking, 23*(10), 677–682. https://doi.org/10.1089/cyber.2020.0250

Lorenzo-Seva, U., & Ferrando, P. J. (2013). Factor 9.2: A comprehensive program for fitting exploratory and semiconfirmatory factor analysis and IRT models. In *, 37. Applied Psychological Measurement* (pp. 497–498). Sage Publications. https://doi.org/10.1177/0146621613487794. Issue 6.

Markland, D. (2007). The golden rule is that there are no golden rules: A commentary on Paul Barrett's recommendations for reporting model fit in structural equation modelling. *Personality and Individual Differences, 42*(5), 851–858. https://doi.org/10.1016/j.paid.2006.09.023

Maxfield, M., & Pituch, K. A. (2020). COVID-19 worry, mental health indicators, and preparedness for future care needs across the adult lifespan. *Aging & Mental Health, 1–8*. https://doi.org/10.1080/13607863.2020.1828272

Moore, K. A., & Lucas, J. J. (2020). COVID-19 distress and worries: The role of attitudes, social support, and positive coping during social isolation. *Psychology and Psychotherapy: Theory, Research and Practice, 1–6*. https://doi.org/10.1111/papt.12308

Panchal, N., Kamal, R., Orgera, K., Cox, C., Garfield, R., Hamel, L., & Chidambaram, P. (2020). In *The implications of COVID-19 for mental health and substance use* (pp. 1–16). Kaiser Family Foundation.

Park, S. W., Cornforth, D. M., Dushoff, J., & Weitz, J. S. (2020). The time scale of asymptomatic transmission affects estimates of epidemic potential in the COVID-19 outbreak. *Epidemics, 31*, Article 100392. https://doi.org/10.1016/j.epidem.2020.100392

Pastor-Barriuso, R., Pérez-Gómez, B., Hernán, M. A., Pérez-Olmeda, M., Yotti, R., Oteo-Iglesias, J., Sanmartín, J. L., León-Gómez, I., Fernández-García, A., Fernández-Navarro, P., Cruz, I., Martín, M., Delgado-Sanz, C., Fernández De Larrea, N., León Paniagua, J., Muñoz-Montalvo, J. F., Blanco, F., Larrauri, A., & Pollán, M. (2020). Infection fatality risk for SARS-CoV-2 in community dwelling population of Spain: Nationwide seroepidemiological study. *The BMJ, 371*. https://doi.org/10.1136/bmj.m4509

Priesemann, V., Brinkmann, M. M., Ciesek, S., Cuschieri, S., Czypionka, T., Giordano, G. Szczurek, E., … (2021). Calling for Pan-European commitment for rapid and sustained reduction in SARS-CoV-2 infections. *The Lancet, 397*(10269), 92–93. https://doi.org/10.1016/S0140-6736(20)32625-8

Puci, M. V., Nosari, G., Loi, F., Puci, G. V., Montomoli, C., & Ferraro, O. E. (2020). Risk perception and worries among health care workers in the COVID-19 pandemic: Findings from an Italian survey. *Healthcare, 8*(4), 535–549. https://doi.org/10.3390/healthcare8040535

Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. *Asian Journal of Psychiatry, 52*, 1–5. https://doi.org/10.1016/j.ajp.2020.102066

Salah, N., Kader, M. A., & Abdeen, M. (2021). Worry perception of the COVID-19 pandemic in children and adolescents with type 1 diabetes. *Metabolism-Clinical and Experimental, 116*, Article 154578. https://doi.org/10.1016/j.metabol.2020.154578

Satici, B., Gocet-Tekin, E., Deniz, M. E., & Satici, S. A. (2020). Adaptation of the fear of COVID-19 scale: Its association with psychological distress and life satisfaction in Turkey. *International Journal of Mental Health and Addiction*. https://doi.org/10.1007/s11469-020-00294-0

Schermelleh-Engel, K., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research, 8*(2), 28–74.

Schilling, O. K., & Diehl, M. (2014). Reactivity to stressor pile-up in adulthood: Effects on daily negative and positive affect. *Psychology and Aging, 29*(1), 72–83. https://doi.org/10.1037/a0035500

Shukla, M., Pandey, R., Singh, T., Riddleston, L., Hutchinson, T., Kumari, V., & Lau, J. Y. (2021). The effect of COVID-19 and related lockdown phases on young Peoples' worries and emotions: Novel data from India. *Frontiers in Public Health, 9*, 1–9.

Vázquez, C., Duque, A., & Hervás, G. (2013). Escala de Satisfacción con la Vida (SWLS) en una muestra representativa de españoles adultos: Validación y datos normativos. *Spanish Journal of Psychology, 16*(82), 1–15.

Vogel, M., Meigen, C., Sobek, C., Ober, P., Igel, U., Körner, A.Poulain, T., … (2021). Well-being and COVID-19-related worries of German children and adolescents: A longitudinal study from pre-COVID to the end of lockdown in spring 2020. *JCPP Advances, 1*(1), Article e12004.

Wilson, J. M., Lee, J., Fitzgerald, H. N., Oosterhoff, B., Sevi, B., & Shook, N. J. (2020). Job insecurity and financial concern during the COVID-19 pandemic are associated with worse mental health. *Journal of Occupational and Environmental Medicine, 62*(9), 686–691. https://doi.org/10.1097/jom.0000000000001962

World Health Organization. (2020). WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19—11-march-2020.

World Medical Association. (2013). World medical association declaration of Helsinki: Ethical principles for medical research involving human subjects. *Journal of American Medical Association (JAMA), 310*(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

Yıldırım, M., Arslan, G., & Ahmad Aziz, I. (2020). Why do people high in COVID-19 worry have more mental health disorders? The roles of resilience and meaning in life. *Psychiatria Danubina, 32*(3–4), 505–512.

Zolopa, C., Burack, J. A., O'Connor, R. M., Corran, C., Lai, J., Bomfim, E.Wendt, D. C., … (2022). Changes in youth mental health, psychological wellbeing, and substance use during the COVID-19 pandemic: A rapid review. *Adolescent Research Review*, 1–17.

Zysberg, L., & Zisberg, A. (2020). Days of worry: Emotional intelligence and social support mediate worry in the COVID-19 pandemic. *Journal of Health Psychology, 1–10*. https://doi.org/10.1177/1359105320949935