Fear of COVID-19 scale: Psychometric characteristics, reliability and validity in the Israeli population

Dana Tzur Bitan[a,b,*], Ariella Grossman-Giron[a,b], Yuval Bloch[b], Yael Mayer[c], Noga Shiffman[d], Shlomo Mendlovic[b]

[a] Department of Behavioral Sciences, Ariel University, Ariel, Israel
[b] Shalvata Mental Health Center, Hod Hasharon, affiliated with the Sackler School of Medicine, Tel Aviv University, Ramat Aviv, Israel
[c] Department of Occupational Science and Occupational Therapy, Faculty of Medicine, The University of British Columbia, Canada.
[d] Hillel Yaffe Medical Center, Hadera, Israel

ARTICLE INFO

ABSTRACT

Mental health clinicians worldwide have been expressing concerns regarding the broad psychological effects of the COVID-19 pandemic. Nonetheless, only a few studies have thus far evaluated the degree of fear of COVID-19, partially due to the lack of validated measures. In this study we evaluated the psychometric properties of the Hebrew version of the Fear of COVID-19 scale (FCV-19S), recently developed to assess different aspects of the fear of the pandemic, in a normative population of participants in Israel. Participants ($n = 639$) were asked to complete the FCV-19S scale, as well as to report anxiety, depression, and stress levels using validated scales. The results a unidimensional factor structure of the FCV-19S which explained 53.71% of the variance. When forcing a two-factor structure model, the analysis revealed two factors pertaining to emotional fear reactions and symptomatic expressions of fear. Gender, sociodemographic status, chronic illness, being in an at-risk group, and having a family member dying of COVID-19 were positively associated with fear of COVID-19. The measure was associated with anxiety, stress and depression. These results suggest that the FCV-19S has good psychometric properties, and can be utilized in studies assessing the effects of the pandemic on the population's mental health.

1. Introduction

The emergence of the coronavirus 2019 pandemic (COVID-19), with its rapid transmission rate and relatively high mortality, has led the scientific community worldwide to monitor its spread globally, while focusing on generating treatments, vaccinations, and infection prevention methods (Bloch et al., 2020; Dong et al., 2020; Shi et al., 2020). Nonetheless, as the pandemic seems to sustain and lead to prolonged social isolation and adverse economic effects, researchers and clinicians have expressed concerns regarding the potential negative effects of COVID-19 on the mental health of the general population (Ornell et al., 2020), with recent studies producing evidence supporting these concerns. For example, Wang et al. (2020) reported elevated levels of stress, anxiety, and depression, and above-cutoff event-related symptoms of PTSD among the Chinese population during the first outbreak, with no significant reductions in anxiety and depression levels four weeks later at its peak. Similarly, Cao et al. (2020) reported that 21.3% of the student population in China were experiencing mild anxiety, 2.7% were reporting moderate anxiety, and 0.9% were suffering from severe anxiety. These findings suggest that the pandemic has an adverse effect on the population's mental health, thus stressing the need to investigate not only its scope, but also its origins.

One of the central factors which might produce elevated levels of stress and anxiety during the pandemic is the fear of COVID-19, and specifically the fear of either being infected, or of infecting loved ones. Colizzi et al. (2020) recently warned that the fear of infection may exacerbate pre-existing mental health disorders or elicit extreme anxiety reactions. They illustrated the effect of fear of COVID-19 by a case report of a 16-year-old adolescent presenting with COVID-19-like symptoms and extreme and persisting health preoccupations, triggered by the fear of being infected. Other studies have demonstrated that intense fear of COVID-19, and particularly being in the proximity of a close relative or friend with COVID-19, are significant predictors of posttraumatic stress (Sun et al., 2020). Furthermore, Morelli et al. (2020) reported that ischemic strokes have almost disappeared from the emergency room in a general hospital in Milan (compared to an annual average of 612 new cases of ischemic stroke, and a monthly average of 51 cases), and suggested that this disturbing

reduction is attributable to the fear of being infected. These findings stress the importance of reliably assessing the fear of COVID-19, so as to predict and control its effects on both healthy and mentally ill populations.

Measures aimed at evaluating specific fears of COVID-19 have recently begun to emerge. Qiu et al. (2020) developed the COVID-19 Peritraumatic Distress Index (CPDI), a broad self-report questionnaire assessing different aspects related to the pandemic, such as level of social functioning and frequency of anxiety, depression, and specific phobias. Utilizing this measure, they found that nearly 35% of the population in China experienced psychological distress. Recently, Ahorsu et al. (2020) developed a more concise tool to specifically address the fear of COVID-19 (Fear of COVID-19, FCV-19S). The scale consists of seven items generated by participant interviews, expert evaluations, and after a thorough review of various valid fear scales. Assessing its factor structure, the authors reported a stable unidimensional structure with robust psychometric properties. The scale has been adopted in India and the UK (Harper et al., 2020; Sakib et al., 2020), and was found to sustain its stable psychometric properties as well as to predict positive behavior change (e.g., improved hand hygiene, social distancing). Thus, as the pandemic seems to have struck many nations across the globe, the need to evaluate the scale's factor structure, its psychometric properties, as well as its associations with imperative and culturally-specific factors in different countries, has become eminent.

In this study we aimed to assess the psychometric properties of the Hebrew version of the Fear of COVID-19 (FCV-19S) scale, as well as to determine its factor structure and associated factors among the Israeli population. Specifically, we aimed to assess the reliability and convergent and discriminant validity of the scale, as well as to assess its association with demographic and pandemic-related factors.

2. Methods

2.1. Participants

A total of 649 individuals participated in the study. Demographic characteristics, as well as work and exposure characteristics during the pandemic, are reported in Table 1. As can be seen, the majority of the sample were either below 30 years of age or in the 31-40 age group. Most of the sample comprised female participants, Israeli-born, and married. About 45% of the sample had a low SES, and 40.8% of the sample had a higher education. Most of the participants reported that they were not working during the COVID-19 pandemic (52.9%), with both parents (31.1%) taking care of the children during this time. Sixteen percent (16.7%) reported that they had chronic diseases, 11.4% reported that their partner had a chronic illness, and 5.2% reported that their children had a chronic illness. Eighteen percent of the sample reported that they were in an at-risk group, and 0.6% reported that a family member of theirs had died of COVID-19. Four percent (4.1%) reported that they had had direct contact with someone who had become infected with COVID-19.

2.2. Measures

Fear of COVID-19 (FCV-19S; Ahorsu et al., 2020). A self-report measure aimed at assessing fear of COVID-19. The scale consists of seven items pertaining to emotional fear reactions towards the pandemic. Participants are requested to respond on a five-item Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The total score ranges between 7 and 35, with a higher sum score indicating a higher fear of COVID-19. The measure showed appropriate internal validity (Cronbach's alpha of 0.82) and was also found to correlate with anxiety and depression, as evaluated by the Hospital Anxiety and Depression Scale (HADS, Montazeri et al., 2003) and the Perceived Vulnerability to Disease Scale (PVDS, Ahmadzadeh et al., 2013). The scale

Table 1

Demographic characteristics and current COVID-19 characteristics of the study sample ($n = 639$).

Demographic characteristics		COVID-19 characteristics	
Factor	n (%)	Factor	*n* (%)
Age		Employment during lockdown	
Below 30	195 (30.5%)	Employed	297 (46.8%)
31-40	212 (33.2%)	Unemployed	338 (52.9%)
41-50	143 (22.4%)	Main caregiver during COVID-19 ($n = 373$)	
51 and above	88 (13.9%)	Person or spouse	129 (20.2%)
Gender		Both parents	199 (31.1%)
Male	97 (15.2%)	Babysitter/family members/others	45 (7.0%)
Female	540 (84.5%)	Background diseases	
Other	2 (0.3%)	No background diseases	527 (82.5%)
Country of birth		Background diseases exist	107 (16.7%)
Israel	566 (88.6%)	Partner's background disease ($n = 469$)	
Other	73 (11.4%)	Background diseases exist	73 (11.4%)
Marital status		No background diseases	396 (62.0%)
Single	130 (20.3%)	Children's background disease	
Living with partner	103 (16.1%)	Background diseases exist	33 (5.2%)
Married	369 (57.7%)	No background diseases	367 (57.4%)
Other	37 (5.8%)	Risk for COVID-19 (self-report)	
Socioeconomic status		Participant in risk group	115 (18.0%)
Below average	292 (45.6%)	Participant not in risk group	492 (77.0%)
Average	135 (21.1%)	Family member dying of COVID-19	
Above average	212 (33.2%)	COVID-19 death in family	4 (0.6%)
Education		No COVID-19 death in family	603 (94.4%)
High school	134 (20.9%)	Direct contact with COVID-19 patient	
Graduate studies	244 (38.2%)	Direct contact with COVID-19 patient	26 (4.1%)
Post-graduate education	261 (40.8%)	No direct contact	581 (90.9%)

was translated into Hebrew by a native English speaker, and then back-translated and compared to the original English version. Also see Appendix A for the original version of the scale, as published by Ahorsu et al., 2020.

The Depression and Anxiety Stress scale (DASS-21; Lovibond & Lovibond, 1995). A self-report measure aimed at assessing three dimensions of mental health: depression, anxiety, and stress. Subscales comprise seven items each. Participants are requested to respond on a four-item Likert scale ranging from 1 (*did not apply to me at all*) to 4 (*applied to me very much*). In the current study, the DASS-21 scale showed good internal consistency, with a Cronbach's alpha of 0.94.

2.3. Procedure

The study was developed and conducted during the COVID-19 pandemic outbreak in Israel (March and April of 2020). An online survey was circulated on different online lists and social media platforms. The overall sample consisted of both healthcare employees and control participants, in order to assess relevant factors in both samples. Informed consent was given online. For the purpose of the current study, and specifically given the need to validate the scale among a normative population, only individuals from the control group (non-healthcare participants) were included in the analysis. The study was approved by the institutional review board of the Shalvata Mental Health Center (MHC), with which the authors are affiliated.

2.4. Statistical analysis

The factor structure of the Fear of COVID-19 scale was assessed using an exploratory factor analysis utilizing a varimax rotation. Reliability analysis then followed using the Cronbach's alpha analysis. Univariate logistic regressions were employed to assess the association

Table 2
Means and SDs, factor loadings and item total correlations of the two-factor model of the COVID-19 measure.

		Loading	Mean	SD	Item correlation
FACTOR 1: Emotional fear reactions					
1	I am most afraid of the coronavirus.	0.82	2.95	1.15	0.63
2	It makes me uncomfortable to think about the coronavirus.	0.81	3.23	1.08	0.58
4	I am afraid of losing my life because of the coronavirus.	0.63	2.15	1.09	0.64
5	When watching news and stories about the coronavirus on social media, I become nervous or anxious.	0.57	2.91	1.10	0.55
FACTOR 2: Symptomatic expressions of fear					
3	My hands become clammy when I think about the coronavirus.	0.79	1.56	0.73	0.52
6	I cannot sleep because I'm worrying about getting the coronavirus.	0.78	1.73	0.85	0.66
7	My heart races or palpitates when I think about getting the coronavirus.	0.79	1.79	0.92	0.70

between fear of COVID-19 and binary demographic and pandemic-related variables. Convergent and discriminative validity of the scale was assessed by evaluating the linear correlation between the factors of the Fear of COVID-19 scale with anxiety, stress, and depression subscales of the DASS. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) for windows v.25 (IBM Corp. Armonk, NY).

3. Results

An exploratory factor analysis revealed a unidimensional factor structure of the Fear of COVID-19 measure, explaining 53.71% of the variance. In order to further explore potential underlying structures, extraction was based on varimax rotation while forcing a two-factor structure model. Means and SDs, and factor loadings and item total correlations of the two-factor model are presented in Table 2.

As can be seen, the two factors corresponded to two distinct factors. First, the emotional fear reaction, which included items such as, "I am most afraid of the coronavirus" and "It makes me uncomfortable to think about the coronavirus." And Factor 2, which comprised symptomatic expressions of fear and included, "My hands become clammy when I think about the coronavirus" and "My heart races or palpitates when I think about getting the coronavirus." Together, the two factors explained 65.76% of the total variance, with Factor 1 explaining 53.71 of the variance and Factor 2 explaining an additional 12.05% of the variance. A reliability analysis assessing both a unidimensional and a two-factor model indicated a Cronbach's alpha of 0.86 for the unidimensional model, 0.77 for Factor 1 and 0.80 for Factor 2.

In order to estimate the convergent validity of the scale, we estimated the association between demographic and pandemic-related characteristics, as well as between the Fear of COVID-19 scale and the DASS scale. Table 3 reports the results of univariate analyses of the

Table 3
Univariate analysis of the association between demographic and COVID-19 characteristics and fear of COVID-19.

	OR	Lower 95% CI	Upper 95% CI	p
Demographic factors				
Gender (female)	1.1	1.06	1.17	<001
SES (high)	0.95	0.93	0.99	<05
Education (higher)	0.97	0.94	1.01	0.22
Work status (working)	0.98	0.94	1.01	0.20
COVID-19-related factors				
Background diseases (have)	1.07	1.02	1.11	<01
Age group of risk (60+)	0.97	0.90	1.03	0.38
Self-report of being in risk group (yes)	1.06	1.02	1.10	<01
Family member death due to COVID (yes)	1.20	1.00	1.43	<05
Contact with an infected person (yes)	0.98	0.90	1.06	0.64

Notes. OR = odds ratio; CI = confidence interval.

association between demographic and COVID-19 characteristics and fear of COVID-19.

Gender was positively associated with fear of COVID-19, with female participants reporting higher rates of fear (OR = 1.1, 95%CI 1.06-1.17, $p < .001$) than did male participants. Socioeconomic status (SES) was also significantly associated with fear of COVID-19, with low-SES participants reporting higher rates of fear (OR = 0.95, 95%CI 0.93-0.99, $p < .05$) than did high-SES participants. Chronic illness, being in an at-risk group (as reported by participants), and having a family member dying of COVID-19 were also positively associated with fear of COVID-19 (OR = 1.07, 95%CI 1.02-1.11, $p < .01$; OR = 1.06, 95%CI 1.02-1.10, $p < .05$; OR = 1.20, 95%CI 1.00-1.43, $p < .05$, respectively).

Convergent and discriminative validity of the fear of COVID-19 measure was estimated by correlating the univariate, as well as the two-factor structure of the measure with the DASS scale. Bivariate Pearson correlations are reported in Table 4.

The total score of the Fear of COVID-19 scale correlated with the three subscales of the DASS, with the highest correlation being with the anxiety subscale ($r = 0.43$, $p < .001$), followed by stress ($r = 0.33$, $p < .001$), and the lowest for depression ($r = 0.24$, $p < .001$). Factor 1 of the emotional fear reaction showed the same pattern of correlation, with the highest correlation being with anxiety ($r = 0.35$, $p < .001$), followed by stress ($r = 0.31$, $p < .001$), and depression ($r = 0.21$, $p < .001$). Factor 2 of symptomatic expressions of fear showed the highest association with the anxiety subscale of the DASS ($r = 0.46$, $p < .001$), followed by stress ($r = 0.29$, $p < .001$), and depression ($r = 0.24$, $p < .001$).

4. Discussion

In this study we aimed to assess the psychometric properties of the FCV-19S, a newly developed scale designed to evaluate different aspects of fear of the COVID-19 pandemic, in a normative population of participants in Israel. The results of the exploratory factor analysis revealed a unidimensional factor structure which explained 53.71% of the variance, but when forced to a two-factor structure model, the two emerging factors explained 65.76% of the total variance. These factors included items representing emotional fear reactions and symptomatic expressions of fear. Cronbach's alpha for the unidimensional model was

Table 4
Convergent discriminative validity of the unidimensional and two-factor model of the fear of COVID-19 scale; correlations with DASS subscales.

		1	2	3	4	5
1	Fear of COVID-19 total					
2	Factor 1: emotional fear reactions	0.94				
3	Factor 2: symptomatic expressions of fear	0.85	0.65			
4	DASS Anxiety subscale	0.43	0.35	0.46		
5	DASS Stress subscale	0.33	0.31	0.29	0.65	
6	DASS Depression subscale	0.24	0.21	0.24	0.66	0.76

Notes. DASS = Depression, Anxiety and Stress Scale; All correlations reported in Table 4 are significant at $p < .001$.

0.86, and for the two-factor models they were 0.77 and 0.80. An examination of the construct validity indicated that the scale was highly related to anxiety and stress, followed by depression. Furthermore, Factor 2 (symptomatic expressions of fear) was highly correlated with the anxiety scale of the DASS. Several demographic factors were associated with elevated COVID-19 fear, such that female participants reported higher rates of fear than did male participants, and participants who had a low SES reported higher rates of fear than did those with a high SES. Moreover, self-reported chronic illness, perceived increased risk for disease-related adverse outcomes, and having a death in the family due to COVID-19 were positively associated with the fear of COVID-19.

The results of the current study provide further support for the validity and reliability of the FCV-19S, demonstrating robust psychometric properties for the Hebrew version among an Israeli population. Although past analyses of this scale pointed to a unidimensional model (Ahorsu et al., 2020; Sakib et al., 2020), our findings provide support for a two-factor structure model, separating emotional fear reactions from symptomatic expressions of fear. Together, these two factors explained a larger proportion of the variance, as well as indicated a differential pattern of association, with Factor 2 (symptomatic expressions of fear) highly correlating with the anxiety scale of the DASS ($r = 0.46$, $p < .001$). As the fear of the pandemic can be considered a normal response to a life-threatening situation, and in some circumstances may benefit the individual by minimizing engagement in risky behaviors and promoting virus-mitigating responses (Harper et al., 2020; Pakpour & Griffiths, 2020), this division may allow researchers and clinicians to differentiate between fear and its associated symptoms. Such a distinction is important as past studies have shown that fear symptomology may lead to the development of common mental disorders, such as depression, anxiety, and substance use disorders (Asselmann et al., 2014).

Exploring the association between fear of COVID-19 and different demographic and pandemic-related factors, our analyses indicated that women show increased fear compared to men. These findings correspond with recent studies which found the same trend of differential emotional distress reactions among male and female participants (Limcaoco et al., 2020; Qiu et al., 2020; Sakib et al., 2020). The higher rates of fear among women can be associated with gender differences in sensitivity to stress, as women display a higher vulnerability to stress, as well as an increased risk for developing mental disorders following stressful life events (Tolin & Foa, 2008). Higher fear was also observed among individuals with a low SES, a finding that resonates with past studies which reported a higher prevalence of psychological distress and psychiatric morbidity among this population stratum (Kun et al., 2009; Lorant et al., 2003). One potential explanation to account for this finding is that proneness to distress is associated with poorer coping styles, weaker social support, and poor access to healthcare, which are more prevalent in groups with a lower SES (Adler & Snibbe, 2003).

The presence of chronic illness, perceived increased risk for disease-related adverse outcomes, and death in the family due to the coronavirus were all associated with higher fear of the pandemic. These findings indicate that personal relevance of the pandemic facilitates a fear reaction among the study participants. In a recent study conducted by Mertens et al. (2020) among 439 participants from 28 different countries, personal relevance such as health risk for loved ones was found to predict fear of COVID-19. It may be suggested that personal relevance of the pandemic, such as personal increased risk or personal loss, can affect an individual's perceived coping potential, or the psychological resources needed to overcome a potential threat (Taylor & Stanton, 2007). Consequently, when the personal risk is perceived to be high, coping ability may be undermined, thus affecting the overall levels of fear. Such a potential exploratory path should be subjected to additional research.

This study has several important implications. Empirically, studies conducted throughout the COVID-19 pandemic would benefit from

including an assessment of COVID-19-related fear, not only as an outcome measure, but also as a potential explanatory factor related to potential vulnerability or, alternatively, resilience. Moreover, identifying the levels of this specific fear among different populations and their associations with specific demographic variables (e.g., gender, socioeconomic status, pre-existing conditions, etc.) could assist in locating potential risk groups. This ability might assist decision-makers, health practitioners, and clinicians to screen those who are more prone to fear during the Covid-19 pandemic and foster the development of educational interventions, while targeting the relevant groups.

Although the study has several strengths, such as the large sample size and relatively heterogenous and representative sample of the general population in Israel, several limitations should also be noted. First, conducting a survey with self-report measures entails potential bias, given that responses may be influenced by factors such as social desirability. Future studies should aim to utilize other measures that would enable a more in-depth analysis. Second, although the sample assessed in the present study was large, convenience sampling may be limited in its ability to reach all strata of the population (for example, individuals with no internet, or the elderly population). Finally, the fact that a large percentage of the sample comprised female participants might affect the generability of our findings. Notwithstanding these limitations, our findings provide support for the utility of the Hebrew version of the FCV-19S, as well as highlight its potential in clinical and research settings.

Author statement

DTB initiated the study, analyzed and interpreted the data, and critically revised the manuscript. AGG wrote the initial draft of the manuscript and critically revised the manuscript. YB co-initiated the study and critically revised the manuscript. YM co-initiated the study and critically revised the manuscript. NG acquired the data and critically revised the manuscript. SM co-initiated the study and critically revised the manuscript.

Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2020.113100.

References

Adler, N.E., Snibbe, A.C., 2003. The role of psychosocial processes in explaining the gradient between socioeconomic status and health. Curr. Dir. Psychol. Sci. 12, 119–123. https://doi.org/10.1111/1467-8721.01245.
Ahmadzadeh, M., Ghamarani, A., Samadi, M., Shamsi, A., Azizollah, A., 2013. The investigation of validity and reliability of a scale of perceived vulnerability to disease in Iran. Br. J. Soc. Sci. 1, 43–51. https://doi.org/10.13140/2.1.1370.1122.
Ahorsu, D.K., Lin, C.Y., Imani, V., Saffari, M., Griffiths, M.D., Pakpour, A.H., 2020. The Fear of COVID-19 Scale: development and initial validation. Inter. J. Ment. Health. Ad. 1–9. https://doi.org/10.1007/s11469-020-00270-8.
Asselmann, E., Wittchen, H.U., Lieb, R., Höfler, M., Beesdo-Baum, K., 2014. Associations of fearful spells and panic attacks with incident anxiety, depressive, and substance use disorders: a 10-year prospective-longitudinal community study of adolescents and young adults. J. Psychiatr. Res. 55, 8–14. https://doi.org/10.1016/j.jpsychires.2014.04.001.
Bloch, E.M., Shoham, S., Casadevall, A., Sachais, B.S., Shaz, B., Winters, J.L., Pekosz, A., 2020. Deployment of convalescent plasma for the prevention and treatment of COVID-19. J. Clin. Invest. https://doi.org/10.1172/JCI138745.
Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., Zheng, J., 2020. The psychological impact of the COVID-19 epidemic on college students in China. Psychiatry Res., 112934. https://doi.org/10.1016/j.psychres.2020.112934.
Colizzi, M., Bortoletto, R., Silvestri, M., Mondini, F., Puttini, E., Cainelli, C., Zoccante, L., 2020. Medically unexplained symptoms in the times of Covid-19 pandemic: a case-report. Brain Behav. Immun., 100073. https://doi.org/10.1016/j.bbih.2020.100073.
Dong, L., Hu, S., Gao, J., 2020. Discovering drugs to treat coronavirus disease 2019

(COVID-19). Drug. Discov. Ther. 14, 58–60. https://doi.org/10.5582/ddt.2020.01012.

Harper, C.A., Satchell, L., Fido, D., Latzman, R., 2020. Functional fear predicts public health compliance in the COVID-19 pandemic. PsyArXiv. https://doi.org/10.31234/OSF.IO/JKFU3.

Kun, P., Han, S., Chen, X., Yao, L., 2009. Prevalence and risk factors for posttraumatic stress disorder: a cross-sectional study among survivors of the Wenchuan 2008 earthquake in China. Depress Anxiety 26, 1134–1140. https://doi.org/10.1002/da.20612.

Limcaoco, R.S.G., Mateos, E.M., Fernandez, J.M., Roncero, C., 2020. Anxiety, worry and perceived stress in the world due to the COVID-19 pandemic, March 2020. Preliminary Results. medRxivhttps://doi.org/10.1101/2020.04.03.20043992.

Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., Ansseau, M., 2003. Socioeconomic inequalities in depression: a meta-analysis. Am. J. Epidemiol. 157, 98–112. https://doi.org/10.1093/aje/kwf182.

Lovibond, P.F., Lovibond, S.H., 1995. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behav. Res. Ther. 33, 335–343.

Mertens, G., Gerritsen, L., Salemink, E., Engelhard, I., 2020. Fear of the coronavirus (COVID-19): predictors in an online study conducted in March 2020. doi:10.31234/osf.io/2p57j.

Montazeri, A., Vahdaninia, M., Ebrahimi, M., Jarvandi, S., 2003. The Hospital Anxietyand Depression Scale (HADS): translation and validation study of the Iranian version. Health Qual. Life Outcomes 1, 14. https://doi.org/10.1186/1477-7525-1-14.

Morelli, N., Rota, E., Terracciano, C., Immovilli, P., Spallazzi, M., Colombi, D., Guidetti, D., 2020. The baffling case of ischemic stroke disappearance from the casualty department in the COVID-19 era. Eur. Neurol. 1–3. https://doi.org/10.1159/000507666.

Ornell, F., Schuch, J.B., Sordi, A.O., Kessler, F.H.P., 2020. Pandemic fear" and COVID-19: mental health burden and strategies. Braz. J. Psychiatry. https://doi.org/10.1590/1516-4446-2020-0008.

Pakpour, A.H., Griffiths, M.D., 2020. The fear of CoVId-19 and its role in preventive behaviors. J. Concurr. Disord Advance online publication.

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., Xu, Y., 2020. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. Gen. Psychiatry 33, e100213. https://doi.org/10.1136/gpsych-2020-100213.

Sakib, N., Mamun, M.A., Bhuiyan, A.I., Hossain, S., Al Mamun, F., Hosen, I., Hossain, M., 2020. Psychometric validation of the Bangla fear of COVID-19 scale: confirmatory factor analysis and Rasch analysis. Int. J. Ment. Health. Ad. 1–22 Advance online publication.

Shi, Y., Wang, Y., Shao, C., Huang, J., Gan, J., Huang, X., Melino, G., 2020. COVID-19 infection: the perspectives on immune responses. Cell. Death Differ. 27, 1451–1454. https://doi.org/10.1038/s41418-020-0530-3.

Sun, L., Sun, Z., Wu, L., Zhu, Z., Zhang, F., Shang, Z., Liu, N., 2020. Prevalence and Risk Factors of Acute Posttraumatic Stress Symptoms during the COVID-19 Outbreak in Wuhan, China. medRxivhttps://doi.org/10.1101/2020.03.06.20032425.

Taylor, S.E., Stanton, A.L., 2007. Coping resources, coping processes, and mental health. Annu. Rev. Clin. Psychol. 3, 377–401. https://doi.org/10.1146/annurev.clinpsy.3.022806.091520.

Tolin, D.F., Foa, E.B., 2008. Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. Psychol. Trauma 1, 37–85. https://doi.org/10.1037/1942-9681.S.1.37.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R.S., Ho, C., 2020. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. Brain. Behav. Immun. https://doi.org/10.1016/j.bbi.2020.04.028.