Psychological Symptoms of COVID-19 Epidemic: A Systematic Review of Current Evidence

Corresponding author: es.mehraeen@gmail.com

Note. There is no conflict of interest.

*This is an early electronic version of the manuscript that has been accepted for publication in Psihologija journal but has not yet been technically prepared for publication. Please note that this is not the final version of the paper as it has yet to be technically prepared for publication and minor changes to the text are possible before the final print. The final version of the article can be subjected to minor changes after proof reading and before final print. Please cite as: SeyedAlinaghi, S. A., Karimi, A., Shobeiri, P., Nowroozi, A., Mehraeen, E., Afsahi, A. M., & Barzegary, A. (2020). Psychological Symptoms of COVID-19 Epidemic: A Systematic Review of Current Evidence. Psihologija. Advance online publication. doi: https://doi.org/10.2298/PSI200703035S
Since the outbreak of COVID–19, several published reports of increased psychological problems turned the attention towards this field and ignited controversies surrounding it. Our aim was to address the issues in this area of interest to provide information for a more robust approach. We carried out a systematic search in PubMed, Embase, Scopus, UpToDate, Science direct, and Web of Science databases. We included English-written original papers, abstracts, reports, and letters to the editor published from December 2019 to April 2020. After evaluating the title and abstract to select the most relevant papers based on inclusion and exclusion criteria, articles underwent quality assessment. The full text of selected articles was then thoroughly read to extract the essential findings. The current review of the literature showed that psychological symptoms might happen among most people, including medical staff, and patients during the COVID–19 epidemic. We identified 24 potential psychological symptoms of the SARS-CoV–2 public health emergency. Reviewing extracted studies revealed that there was a risk of occurrence of psychological symptoms among the general population during the COVID–19 outbreak. However, first-line medical staffs who provide healthcare services to patients with COVID–19 were more susceptible to these symptoms. The systematic review highlights that anxiety, depression, stress, and sleep disturbances symptoms were the most frequent psychological symptoms of the COVID–19 pandemic situation. It is recommended that future studies evaluate practical interventions to reduce psychological symptoms, especially in health care workers during the COVID–19 epidemic.

Key words: Psychological symptom, Mental symptom, Psychiatric disease, Coronavirus, COVID–19, SARS-CoV–2
Novel Corona Virus Disease (COVID–19) is a pandemic condition that first appeared in Wuhan, China, in late 2019 (Mehraeen et al., 2020). The disease was at first limited to China but soon began to spread to other countries. Consequently, the World Health Organization (WHO) declared the issue to be a Public Health Emergency on January 30, 2020, and later, a pandemic (Mehraeen et al., 2020). As of April 25, more than 2.8 million cases have been identified, of which 197,578 have died. The virus is mainly transmitted via droplets and contact (Gu et al., 2020; Organization, 2020). Early symptoms are similar to many other respiratory viral illnesses and include fever, cough, and fatigue (Cao et al., 2020). Some eventually progress to more severe conditions such as Acute Respiratory Distress Syndrome (ARDS) or even death. Some risk factors have been proposed for the severity of the disease, including high age and pre-existing health conditions ((CDC), 2020; Bo et al., 2020; Wu & McGoogan, 2020).

As it is a new disease, many characteristics of the pathogen are yet to be unraveled. Currently, there are no confirmed treatments for COVID–19 (Mehraeen, 2020; Sanders et al., 2020), and prevention is highly crucial. Countries have taken severe measures to cease the spread of the disease. Many governments have imposed restrictions such as lockdowns to prevent unnecessary travel and interaction. It is estimated that more than 1/3 of the world’s population is somehow facing a constraint because of the new coronavirus (Business Insider, 2020). Besides, many health services, such as elective surgeries are postponed and suspended, to transfer resources to the fight with COVID–19 and reduce hospital visits (Centers for Disease Control and Prevention, 2020; Nowroozi & Amini, 2020; Zarrintan, 2020). WHO recommends washing hands frequently and maintaining social distancing for healthy individuals. If a person is diagnosed with COVID–19 or is experiencing symptoms, it is recommended to be isolated from other people(World Health Organization, 2020a, 2020b).

When an outbreak occurs, not only are people affected by clinical results of the disease itself, but also by the psychological burden of the disease(Xiao, 2020). A study conducted on the survivors of the Ebola epidemic in the Democratic Republic of Congo demonstrated that almost all patients were fearful after definite diagnosis, and 50% thought that they are going to die (Roo et al., 1998; JamaliMoghadam, 2015). Similar psychological concerns were present in influenza and SARS outbreaks (Rubin et al., 2010; Sim et al., 2010; Wang et al., 2020). For instance, a study showed that some patients refused to continue chemotherapy due to a fear of SARS infection (Chen et al., 2004). Such psychological effects will undoubtedly also happen in a pandemic of this scale. The world has initiated to compare
the ongoing situation to war (Cohen & Kupferschmidt, 2020; Forbes, 2020; Maxwell et al., 2020), and people are panic buying and storing goods (Lins & Aquino, 2020; Sim et al., 2020).

Social distancing measures like quarantines reduce in-person interactions and therefore increase the chance and degree of psychological problems, for instance, depression and anxiety (Xiao, 2020). Due to the high need for hygiene in this period, obsessive-compulsive disorders (OCD) might also worsen (Liang et al., 2020). Additionally, seeking psychological advice is more complicated than before because of travel bans and isolations (Xiao, 2020). Moreover, the uncertain nature of COVID–19 is another cause of mental distress not only for the patients but also for health care providers. Therefore, it is crucial to pay exclusive attention to the psychological consequences of COVID–19 pandemic by better understanding and finding feasible methods for overcoming them.

In this systematic review, we aim to report and summarize the most common psychological disturbances caused by COVID–19 pandemic according to available literature, in order to help the scientific community better address and manage them. Furthermore, by addressing the high-risk groups and their needs, we might be able to identify them more vividly, and applying personalized careful cares specialized at minimizing their risks.

Methods

Literature Search Strategy

This study was a systematic literature review conducted in the first half of 2020 to explore the current evidence on psychological disorders for the COVID–19 epidemic. A systematic search was carried out in the databases of PubMed, Embase, Scopus, UpToDate, Science direct, and Web of Science using the keywords of psychological disorder, mental disorder, mental, psychiatric disease, psychiatric illness, psychiatric disorder, psychiatric diagnosis, behavior disorder, Coronavirus, COVID–19, SARS-CoV–2, Novel Coronavirus, and 2019-nCoV based on the following search strategy, using query (C) as our final search strategy: A. Psychological disorder [Title] OR Mental disorder [Title] OR Mental [Title] OR Psychiatric disease [Title] OR Psychiatric Illness [Title] OR Intervention [Title] OR Psychiatric disorder [Title] OR Psychiatric diagnosis [Title] OR Behavior disorder [Title]; B. Coronavirus [Title] OR COVID–19 [Title] OR SARS-CoV–2 [Title] OR Novel [Title] OR Coronavirus [Title] OR2019-nCoV [Title]; C. [A] AND [B]
We included the peer-reviewed original papers, reports, and letters to the editor published from December 2019 to April 2020. The ongoing projects, and articles addressing non-human studies, or discussing COVID–19 symptoms in general, without reference to psychological symptoms, were excluded.

**Literature Selection**

We assessed the title and abstract of retrieved articles and selected the most relevant studies based on the inclusion and exclusion criteria. To ensure the quality of selected articles, a checklist (Table 1) with 15 items was developed based on the relevant studies (BinDhim et al., 2015; McKay et al., 2018; Zapata et al., 2015). The quality of articles was evaluated by two independent researchers and rated on a three-point scale: low quality (0–5), medium quality (6–10), and high quality (11–15). The full text of selected articles was then thoroughly read to extract the essential findings.

**Results**

We retrieved 259 sources using applied systematic search strategies. After the primary review of identified articles, 103 duplicates were removed, and 156 records were chosen for the main screening. As illustrated in Figure 1, we finally included 41 eligible articles that met the inclusion criteria. These 41 studies were published from January 2020 to April 29, 2020. The mean quality score of the selected articles was 13 (range: 11 to 15), indicating the high quality of these studies. See Table 1 for the checklist used to obtain the quality score.

The current review of the literature tries to summarize the investigations of the researchers on how the psychological symptoms might happen among most people, such as medical staff, and patients during the COVID–19 epidemic. We identified 24 potential psychological symptoms of SARS-CoV-2 public health emergency including Stress, Anxiety, Depression, Sleep disturbance symptoms, Emotional distress, Distress, Work-related worries, Post-traumatic stress disorders (PTSD), Negative coping styles, Anger, Cognitive problems, Vicarious dramatization, Fear, Paranoia, Distress related to social media, OCD, Interpersonal sensitivity, Psychoticism, Thoughts of being in danger, Psychological needs of existence, relatedness and growth, Dream anxiety, Somatization, Apprehensiveness, and Hopelessness. The reviewed articles and the identified psychological symptoms are described in Table 2.
According to the findings, 55.5% of the articles presented in this section investigated psychological symptoms of COVID–19 among the general population. Also, 36.1% of the studies tried to address and recognize the occurrence of mental symptoms among the medical staff. Other studies tried to pinpoint the situation of mental health among medical students, participants with quarantine, patients, and their families as distinct target populations (Figure 2).

A review of studies showed that symptoms related to anxiety ($n = 29$), depression ($n = 25$), stress ($n = 13$), and sleep disturbance symptoms ($n = 10$) were the most frequent psychological consequences of COVID–19 disease. The percentage of psychological disorders of COVID–19 is reported in Figure 3.

Out of 41 included studies in this systematic review, 29 (80.6%) proposed an established questionnaire, and 4 (11.1%) utilized a novel one, and 3 (8.3%) did not use a questionnaire that some of them implemented an interview-based method instead.

Overall, a total of 71 previously established questionnaires were distributed among participants of 29 studies (an average of 2.45 questionnaires per study). The most common were Generalized Anxiety Disorder–7 (GAD–7) ($n = 8$), Patient Health Questionnaire–9 (PHQ–9) ($n = 7$), Impact of Event Scale-Revised (IES–R) ($n = 6$), Insomnia Severity Index (ISI) ($n = 4$), Depression, Anxiety and Stress Scale–21 (DASS–21) ($n = 3$), Self-rating Anxiety Scale (SAS) ($n = 3$), Self-Rating Depression Scale (SDS) ($n = 2$), Pittsburgh Sleep Quality Index (PSQI) ($n = 2$), PTSD Checklist-Civilian Version (PCL–C) ($n = 2$), modified versions of mentioned tests ($n = 3$), and other tests ($n = 31$).

**Discussion**

COVID–19 has rapidly crossed borders, infecting people throughout the whole world (Roy et al., 2020). Because of the unexpected nature of the pandemic and the infectious power of the COVID–19, it will unavoidably increase the chance for experiencing psychological symptoms in many people. It is noteworthy to mention that many of the prevalent psychological symptoms can potentially be reactionary and a kind of coping with the fear of this pandemic, as is part of the natural process of infectious epidemics most of the time, rather than the direct consequence of the disease itself. It is essential to understand and consider public psychological status during this emergency occasion (Chen Wang et al.,
2020). We aimed to review current evidence on psychological symptoms of COVID–19 emergency health situations.

According to the studies reviewed in the 2020, (Ahmed et al., 2020; Gao et al., 2020; Huang & Zhao, 2020; Lee, 2020; Xu et al., 2020; Yuan et al., 2020; Zhang & Ma, 2020), there is a high prevalence of mental health problems, and everyone may be at risk for psychological symptoms such as anxiety, depression, and stress during COVID–19 epidemic. The vulnerability to psychological consequences across populations in the COVID–19 outbreak could be attributable to various factors, including gender, occupation, rate of face to people with COVID–19 infection, length of isolation, and the amount of exposure to the media (Zhang et al., 2020). Female gender, previous diagnoses of mental health problems or neurological disorders, having symptoms associated with the virus, or those with a close relative infected were associated with greater symptomatology in all three variables (Moghanibashi-Mansourieh, 2020). Wang et al. (2020) carried out a longitudinal study to survey the general public in China to better understand their levels of psychological symptoms during the initial stage of the COVID–19 epidemic. The results of that study showed that more than half of the respondents rated the psychological impact as moderate-to-severe, and about one-third proclaimed moderate-to-severe anxiety (Wang et al., 2020). In a similar study, Ahmed et al. reported that anxiety, depression, alcohol use disorder, locked down in their own home for infinite time, disease of family and friends, death of closed one all these could lead to psychological consequences. In addition, the prevalence rate of anxiety and depression was troublesome, which could very easily develop a potent psychiatric symptom over a long period of time (Ahmed et al., 2020).

Healthcare workers (HCW) are first-line fighters that are providing health requirements for patients with COVID–19. Every day, they encountered a high risk of being infected and are exposed to long and distressing work shifts to meet healthcare services (Zhang et al., 2020). Based on the results, HCW were more susceptible to psychological impairments caused by COVID–19 infection.

COVID–19 has a considerable impact on public health and poses a challenge to healthcare workers, particularly to front-line medical staff who are exposed to direct contact with the patients (Chung & Yeung, 2020; Kang et al., 2020; Lu et al., 2020; Tan et al., 2020; To et al., 2020; Wu et al., 2020). The results of similar studies showed that the incidence of anxiety, depression, OCD, and somatization is high among medical staff (Cao et al., 2020; Huang et
Kang et al. (2020) in a cross-sectional observational study, showed that the COVID–19 epidemic in Hubei resulted in increased workload and stress for medical staff. The most important factors associated with stress included the supposed threat of infection to themselves and their families, patient mortality, and the availability of clear infection control guidance (Kang et al., 2020).

Lai et al. (2020) in a survey of HCWs in hospitals equipped with fever clinics or COVID–19 care wards in China, reported that participants experiencing psychological symptoms, especially nurses and front-line HCWs directly engaged in the care for the patients with COVID–19 (Lai et al., 2020). As a result, growth attention should be paid to the psychological problems of the medical staff, especially front-line nurses, under the situation of the spread and control of COVID–19 (Lin et al., 2020). For this purpose, front-line HCWs participating in the care of COVID–19-infected patients and staff working in isolation ward should receive prior psychological crisis intervention training to anticipate the psychological consequences of the COVID–19 pandemic situation (Chung & Yeung, 2020).

The research included in this work shows that more common psychological symptoms such as stress, anxiety, depression, sleep disturbance symptoms, and distress might happen to people during the COVID–19 public health emergency. Rapid transmission of COVID–19 around the world and reporting continuously of this event by the media has led to a massive public reaction about the pandemic situation (Roy et al., 2020). Social media has a huge impact on people's moods, and it is obvious that the high prevalence of mental health problems, positively associated with frequent social media exposure during the COVID–19 outbreak (Gao et al., 2020). Therefore, in addition to being a community physical health consequence, COVID–19 affected public mental health and caused psychological symptoms like stress, anxiety, and depression (Wang et al., 2020).

Cao et al. (2020) in a related study, represented that approximately 24.9% of college students had experienced anxiety because of the COVID–19 outbreak. However, living in urban areas, living with parents, having a steady family income were protective factors for the students against experienced anxiety during the COVID–19 epidemic (Cao et al., 2020). Similarly, Liang et al. (2020) in a cross-sectional study, demonstrated that low education levels, enterprise employees, PTSD, and negative coping styles were the influence factors of youth psychological consequences during the COVID–19 outbreak (Liang et al., 2020).
An online investigation was conducted on a sample of 1074 Chinese people. Results revealed a low level of mental well-being and a high level of anxiety, depression, hazardous and harmful alcohol use. Results of that survey also showed that young people aged 21–40 years are in a more vulnerable position in terms of psychological symptoms (Ahmed et al., 2020). Bo et al. (2020) in an online assessment, found that most clinically stable COVID–19 patients suffered from significant psychological consequences, especially PTSD, prior to discharge from hospital (Bo et al., 2020). All these studies present us valuable data to assess the psychological situation in the era of COVID–19. Nevertheless, one major setback of them all is the lack of a control group to check for a more reliable change in the mental health status of the society.

Ultimately based on our findings in this review, we suggest some practical and protective measures to reduce the negative psychological consequences of this devastating pandemic on the community: getting enough sleep, eating healthy foods, engaging in regular physical activity, avoiding tobacco, alcohol and, drugs, relaxing and recharging activities, limiting screen time, maintaining daily life routines, limiting exposure to news media, keeping busy, focusing on positive mind and thoughts, setting priorities for missions and activities, having positive connections with others, being supportive of family members and friends and finally asking help when required are proposed procedures to get through this pandemic in a more mental and physical wellbeing.

**Study Limitations**

Some included studies were restricted in the matter of data attainability, sample size, and methodological appropriateness. Hence, the cautious interpretation of reported findings inside that context should be considered. Furthermore, due to the circumstances of the current pandemic, many published articles were of Chinese origin. Considering the global pandemic of COVID–19, further literature from all over the world needs to be included in future systematic reviews. We encourage researchers to continue to keep track of the literature and update our knowledge upon emergence of new evidence.

**Conclusion**

The present systematic literature review highlights that anxiety, depression, stress, and sleep disturbance symptoms were the most frequent psychological symptoms of the COVID–19 pandemic situation. The available research shows that there is a risk of
occurrence of psychological symptoms in the general population and HCWs during the COVID–19 outbreak. However, first-line medical staff who provide healthcare services to patients with COVID–19 were more susceptible to these symptoms. It is recommended that future studies evaluate practical interventions to reduce psychological symptoms, especially in HCWs during the COVID–19 epidemic.

References

Centers for Disease Control and Prevention (2020). Coronavirus Disease 2019 (COVID–19) [https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-criteria.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fclinical-criteria.html]

†Ahmed, M. Z., Ahmed, O., Aibao, Z., Hanbin, S., Siyu, L., & Ahmad, A. (2020). Epidemic of COVID–19 in China and associated Psychological Problems [Article]. Asian Journal of Psychiatry, 51. https://doi.org/10.1016/j.ajp.2020.102092

*Ahmed, M. Z., Ahmed, O., Aibao, Z., Hanbin, S., Siyu, L., & Ahmad, A. (2020). Epidemic of COVID–19 in China and associated Psychological Problems [Article]. Asian Journal of Psychiatry, 51. https://doi.org/10.1016/j.ajp.2020.102092

*Araujo, F. J. O., de Lima, L. S. A., Cidade, P. I. M., Nobre, C. B., & Neto, M. L. R. (2020). Impact Of Sars-Cov-2 And Its Reverberation In Global Higher Education And Mental Health. Psychiatry Research, 288, 112977. https://doi.org/10.1016/j.psychres.2020.112977

BinDhim, N. F., Hawkey, A., & Trevena, L. (2015). A systematic review of quality assessment methods for smartphone health apps. Telemedicine and e-Health, 21(2), 97–104.

*Bo, H. X., Li, W., Yang, Y., Wang, Y., Zhang, Q., Cheung, T., Wu, X., & Xiang, Y. T. (2020). Posttraumatic stress symptoms and attitude toward crisis mental health services among clinically stable patients with COVID-19 in China [Article in Press]. Psychological Medicine, 1–7. https://doi.org/10.1017/S0033291720000999

Business Insider. (2020). A third of the global population is on coronavirus lockdown — here’s our constantly updated list of countries locking down and opening up. Retrieved April 25, 2020 from https://www.businessinsider.com/countries-on-lockdown-coronavirus-italy-2020-3

*Cai, H., Tu, B., Ma, J., Chen, L., Fu, L., Jiang, Y., & Zhuang, Q. (2020). Psychological Impact and Coping Strategies of Frontline Medical Staff in Hunan Between January and March 2020 During the Outbreak of Coronavirus Disease 2019 (COVID-19) in Hubei, China. Medical science monitor: international medical journal of experimental and clinical research, 26, e924171-1.

*Cao, J., Wei, J., Zhu, H., Duan, Y., Geng, W., Hong, X., Jiang, J., Zhao, X., & Zhu, B. (2020). A Study of Basic Needs and Psychological Wellbeing of Medical Workers in the Fever Clinic of a Tertiary General Hospital in Beijing during the COVID–19 Outbreak [Article in Press]. Psychotherapy and Psychosomatics. https://doi.org/10.1159/000507453

*Articles actually selected for the review
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 [Article]. Psychiatry Research, 287. https://doi.org/10.1016/j.psychres.2020.112934

Cao, Y., Liu, X., Xiong, L., & Cai, K. (2020). Imaging and clinical features of patients with 2019 novel coronavirus SARS-CoV-2: A systematic review and meta-analysis. Journal of Medical Virology, 92(9), 1449–1459. doi: 10.1002/jmv.25822. Epub 2020 Apr 10. PMID: 32242947; PMCID: PMC7228215.

Centers for Disease Control and Prevention. (2020). Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID–19) in Healthcare Settings. Retrieved April 27, 2020 from https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html

Chen, J. (2020). Pathogenicity and transmissibility of 2019-nCoV—a quick overview and comparison with other emerging viruses. Microbes and infection.

Chen, Y. M., Perng, R. P., Chu, H., Tsai, C. M., & Whang-Peng, J. (2004). Impact of severe acute respiratory syndrome on the status of lung cancer chemotherapy patients and a correlation of the signs and symptoms. Lung Cancer, 45(1), 39–43. https://doi.org/10.1016/j.lungcan.2004.01.002

Chung, J. P. Y., & Yeung, W. S. (2020). Staff Mental Health Self-Assessment During the COVID-19 Outbreak. East Asian Arch Psychiatry, 30(1), 34. https://doi.org/10.12809/eaap2014

De Roo, A., Ado, B., Rose, B., Guimard, Y., Fonck, K., & Colebunders, R. (1998). Survey among survivors of the 1995 Ebola epidemic in Kikwit, Democratic Republic of Congo: their feelings and experiences. Trop Med Int Health, 3(11), 883–885. https://doi.org/10.1046/j.1365-3156.1998.00322.x

Forbes. (2020). COVID–19: “Our Generation’s Great War”. Retrieved April 25, 2020 from https://www.forbes.com/sites/rrapier/2020/04/05/covid-19-our-generations-great-war/

Gu, J., Han, B., & Wang, J. (2020). COVID–19: Gastrointestinal Manifestations and Potential Fecal–Oral Transmission. Gastroenterology.

Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., & Gu, X. (2020). Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. The Lancet, 395(10223), 497–506.

Huang, J. Z., Han, M. F., Luo, T. D., Ren, A. K., & Zhou, X. P. (2020). [Mental health survey of 230 medical staff in a tertiary infectious disease hospital for COVID-19]. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi, 38(0), E001. https://doi.org/10.3760/cma.j.cn121094-20200219-00063

Huang, Y., & Zhao, N. (2020). Mental health burden for the public affected by the COVID-19 outbreak in China: Who will be the high-risk group? [Article in Press]. Psychology, Health & Medicine, 1–12. https://doi.org/10.1080/13548506.2020.1754438
JamaliMoghadam SR, O. N., Bayrami S, JamaliMoghadam S, SeyedAlinaghi S. (2015). Ebola viral disease: a review literature. Asian Pacific Journal of Tropical Biomedicine, 5(4), 260–267.

*Kang, L., Ma, S., Chen, M., Yang, J., Wang, Y., Li, R., Yao, L., Bai, H., Cai, Z., Xiang Yang, B., Hu, S., Zhang, K., Wang, G., Ma, C., & Liu, Z. (2020). Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study [Article in Press]. Brain, Behavior, and Immunity. https://doi.org/10.1016/j.bbi.2020.03.028

*Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019 [Article]. JAMA Network Open, 3(3). https://doi.org/10.1001/jamanetworkopen.2020.3976

*Lee, S. A. (2020). Coronavirus Anxiety Scale: A brief mental health screener for COVID–19 related anxiety. Death studies, 1–9. https://doi.org/10.1080/07481187.2020.1748481

*Liang, Y., Chen, M., Zheng, X., & Liu, J. (2020). Screening for Chinese medical staff mental health by SDS and SAS during the outbreak of COVID–19 [Letter]. Journal of Psychosomatic Research, 133. https://doi.org/10.1016/j.jpsychores.2020.110102

*Lin, C., Xiang, J., Yan, M., Li, H., Huang, S., & Shen, C. (2020). Comparison of throat swabs and sputum specimens for viral nucleic acid detection in 52 cases of novel coronavirus (SARS-Cov-2)-infected pneumonia (COVID-19). Clinical Chemistry and Laboratory Medicine. 58(7), 1089–1094. doi: 10.1515/cclm-2020-0187. PMID: 32301745.

Lins, S., & Aquino, S. (2020). Development and initial psychometric properties of a panic buying scale during COVID-19 pandemic. Heliyon, 6(9), e04746. https://doi.org/10.1016/j.heliyon.2020.e04746

*Liu, S., Yang, L., Zhang, C., Xiang, Y. T., Liu, Z., Hu, S., & Zhang, B. (2020). Online mental health services in China during the COVID–19 outbreak [Letter]. The Lancet Psychiatry, 7(4), e17–e18. https://doi.org/10.1016/S2215-0366(20)30077-8

*Losada-Baltar, A., Jiménez-Gonzalo, L., Gallego-Alberto, L., Pedroso-Chaparro, M. D. S., Fernandes-Pires, J., & Márquez-González, M. (2020). "We're staying at home". Association of self-perceptions of aging, personal and family resources and loneliness with psychological distress during the lock-down period of COVID–19 [Article in Press]. The journals of gerontology. Series B, Psychological sciences and social sciences. https://doi.org/10.1093/geronb/gbaa048

*Lu, W., Wang, H., Lin, Y., & Li, L. (2020). Psychological status of medical workforce during the COVID-19 pandemic: A cross-sectional study [Article]. Psychiatry Research, 288. https://doi.org/10.1016/j.psychres.2020.112936

Maxwell, D. N., Perl, T. M., & Cutrell, J. B. (2020). "The Art of War" in the Era of Coronavirus Disease 2019 (COVID–19). Clinical infectious diseases: an official publication of the Infectious Diseases Society of America, ciaa229. https://doi.org/10.1093/cid/ciaa229

*Mazza, C., Ricci, E., Biondi, S., Colasanti, M., Ferracuti, S., Napoli, C., & Roma, P. (2020). A Nationwide Survey of Psychological Distress among Italian People during the COVID-19 Pandemic: Immediate Psychological Responses and Associated Factors. International Journal of Environmental Research and Public Health, 17(9). https://doi.org/10.3390/ijerph17093165
McKay, F. H., Cheng, C., Wright, A., Shill, J., Stephens, H., & Uccellini, M. (2018). Evaluating mobile phone applications for health behaviour change: a systematic review. *Journal of Telemedicine and Telecare, 24*(1), 22–30.

Mehraeen, E., Behnezhad, F., Salehi, M. A., Noori, T., Harandi, H., & SeyedAlinaghi, S. (2020). Olfactory and gustatory dysfunctions due to the coronavirus disease (COVID–19): a review of current evidence. *European Archives of Oto-Rhino-Laryngology, 1–6.*

Mehraeen, E., Hayati, B., Saeidi, S., Heydari, M., & Seyed Alinaghi, S. (2020). Self-Care Instructions for People Not Requiring Hospitalization for Coronavirus Disease 2019 (COVID–19). *Archives of Clinical Infectious Diseases.*

Mehraeen, E., Karimi, A., Barzegary, A., Vahedi, F., Afsahi, A. M., Dadras, O., Moradmand-Badie, B., Alinaghi, S. A., & Jahanfar S. (2020). Predictors of mortality in patients with COVID–19–a systematic review. *European Journal of Integrative Medicine, 101226.* doi: 10.1016/j.eujim.2020.101226. Epub 2020 Oct 17. PMID: 33101547; PMCID: PMC7568488.

*Moccia, L., Janiri, D., Pepe, M., Dattoli, L., Molinaro, M., De Martin, V., Chieffo, D., Janiri, L., Fiorillo, A., Sani, G., & Di Nicola, M. (2020). Affective temperament, attachment style, and the psychological impact of the COVID–19 outbreak: an early report on the Italian general population. *Brain, Behavior, and Immunity.* https://doi.org/10.1016/j.bbi.2020.04.048

*Moghani-Bashi-Mansourieh, A. (2020). Assessing the anxiety level of Iranian general population during COVID–19 outbreak. *Asian Journal of Psychiatry,* 102076. https://doi.org/10.1016/j.ajp.2020.102076

Nowroozi, A., & Amini, E. (2020). Urology practice in the time of COVID–19. *Urology Journal.* https://doi.org/10.22037/uj.v0i0.6065

Naidoo, J., Reuss, J. E., Suresh, K., Feller-Kopman, D., Forde, P. M., Steinke, S. M., Rock, C., Johnson, D. B., Nishino, M., Brahmer, J. R. (2020). Immune-related (IR)-pneumonitis during the COVID-19 pandemic: multidisciplinary recommendations for diagnosis and management. *Journal for Immunotherapy of Cancer, 8*(1).

*Özdin, S., & Bayrak Özdin, Ş. (2020). Levels and predictors of anxiety, depression and health anxiety during COVID–19 pandemic in Turkish society: The importance of gender. *International Journal of Social Psychiatry,* 66(5), 504–511. https://doi.org/10.1177/0020764020927051

*Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic [Article]. *Asian Journal of Psychiatry, 51.* https://doi.org/10.1016/j.ajp.2020.102083

Rubin, G. J., Potts, H. W., & Michie, S. (2010). The impact of communications about swine flu (influenza A H1N1v) on public responses to the outbreak: results from 36 national telephone surveys in the UK. *Health Technol Assess,* 14(34), 183–266. https://doi.org/10.3310/hta14340-03

*Sadiković, S., Branovački, B., Olijača, M., Mitrović, D., Pajić, D., & Smederevac, S. (2020). Daily Monitoring of Emotional Responses to the Coronavirus Pandemic in Serbia: A Citizen Science Approach. *Frontiers in Psychology, 11,* 2133. https://doi.org/10.3389/fpsyg.2020.02133

Sanders, J. M., Monogue, M. L., Jodlowski, T. Z., & Cutrell, J. B. (2020). Pharmacologic Treatments for Coronavirus Disease 2019 (COVID–19): A Review. *JAMA.* https://doi.org/10.1001/jama.2020.6019
Sim, K., Chua, H. C., Vieta, E., & Fernandez, G. (2020). The anatomy of panic buying related to the current COVID-19 pandemic. *Psychiatry Research*, 288, 113015. https://doi.org/10.1016/j.psychres.2020.113015

Sim, K., Huak Chan, Y., Chong, P. N., Chua, H. C., & Wen Soon, S. (2010). Psychosocial and coping responses within the community health care setting towards a national outbreak of an infectious disease. *Journal of Psychosomatic Research*, 68(2), 195–202. https://doi.org/10.1016/j.jpsychores.2009.04.004

*Tan, B. Y. Q., Chew, N. W. S., Lee, G. K. H., Jing, M., Goh, Y., Yeo, L. L. L., Zhang, K., Chin, H. K., Ahmad, A., Khan, F. A., Shanmugan, G. N., Chan, B. P. L., Sunny, S., Chandra, B., Ong, J. J. Y., Paliwal, P. R., Wong, L. Y. H., Sagayanathan, R., Chen, J., . . . & Sharma, V. K. (2020). Psychological Impact of the COVID-19 Pandemic on Health Care Workers in Singapore. *Annals of Internal Medicine*. https://doi.org/10.7326/m20-1083

*Tian, F., Li, H., Tian, S., Yang, J., Shao, J., & Tian, C. (2020). Psychological symptoms of ordinary Chinese citizens based on SCL-90 during the level I emergency response to COVID-19 [Article]. *Psychiatry Research*, 288. https://doi.org/10.1016/j.psychres.2020.112992

*To, K. K., Tsang, O. T., Leung, W. S., Tam, A. R., Wu, T. C., Lung, D. C., Yip, C. C., Cai, J. P., Chan, J. M., Chik, T. S., Lau, D. P., Choi, C. Y., Chen, L. L., Chan, W. M., Chan, K. H., Ip, J. D., Ng, A. C., Poon, R. W., Luo, C. T., Cheng, V. C., Chan, J. F., Hung, I. F., Chen, Z., Chen, H., Yuen, K. Y. (2020). Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: an observational cohort study. *The Lancet Infectious Diseases*, 20(5), 565–574. doi: 10.1016/S1473-3099(20)30196-1. Epub 2020 Mar 23. PMID: 32213337; PMCID: PMC7158907.

Wang, C., Horby, P. W., Hayden, F. G., & Gao, G. F. (2020). A novel coronavirus outbreak of global health concern. *The Lancet*, 395(10223), 470–473.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health*, 17(5), 1729.

*Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. *International Journal of Environmental Research and Public Health*, 17(5). https://doi.org/10.3390/ijerph17051729

*Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R. S., Choo, F. N., Tran, B., Ho, R., Sharma, V. K., & Ho, C. (2020). A longitudinal study on the mental health of general population during the COVID–19 epidemic in China [Article in Press]. *Brain, Behavior, and Immunity*. https://doi.org/10.1016/j.bbi.2020.04.028

Wang, M., Cao, R., Zhang, L., Yang, X., Liu, J., Xu, M., Shi, Z., Hu, Z., Zhong, W., & Xiao, G. (2020). Remdesivir and chloroquine effectively inhibit the recently emerged novel coronavirus (2019-nCoV) in vitro. *Cell Research*, 30(3), 269–271.

World Health Organization. (2020a). *Coronavirus disease (COVID–19) advice for the public*. Retrieved April 25, 2020 from https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public

World Health Organization. (2020b). *Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected*. Retrieved April 25, 2020 from https://www.who.int/publications-detail/infection-prevention-and-control-during-health-care-when-novel-coronavirus-(ncov)-infection-is-suspected-202000125
Wu, W., Zhang, Y., Wang, P., Zhang, L., Wang, G., Lei, G., Xiao, Q., Cao, X., Bian, Y., Xie, S., Huang, F., Luo, N., Zhang, J., & Luo, M. (2020). Psychological stress of medical staffs during outbreak of COVID–19 and adjustment strategy. Journal of Medical Virology. https://doi.org/10.1002/jmv.25914

Wu, Z., & McGoogan, J. M. (2020). Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases From the Chinese Center for Disease Control and Prevention. JAMA. https://doi.org/10.1001/jama.2020.2648

Xiao, C. (2020). A Novel Approach of Consultation on 2019 Novel Coronavirus (COVID-19)-Related Psychological and Mental Problems: Structured Letter Therapy. Psychiatry Investig, 17(2), 175–176. https://doi.org/10.30773/pi.2020.0047

Xu, X., Han, M., Li, T., Sun, W., Wang, D., Fu, B., Zhou, Y., Zheng, X., Yang, Y., & Li, X. (2020). Effective Treatment of Severe COVID-19 Patients with Tocilizumab. In ChinaXiv: 20200300026.

*Yuan, R., Xu, Q. H., Xia, C. C., Lou, C. Y., Xie, Z., Ge, Q. M., & Shao, Y. (2020). Psychological status of parents of hospitalized children during the COVID–19 epidemic in China [Letter]. Psychiatry Research, 288. https://doi.org/10.1016/j.psychres.2020.112953

*Yuan, S., Liao, Z., Huang, H., Jiang, B., Zhang, X., Wang, Y., & Zhao, M. (2020). Comparison of the Indicators of Psychological Stress in the Population of Hubei Province and Non-Endemic Provinces in China During Two Weeks During the Coronavirus Disease 2019 (COVID–19) Outbreak in February 2020. Medical Science Monitor, 26, e923767. https://doi.org/10.12659/msm.923767

Zapata, B. C., Fernández-Alemán, J. L., Idri, A., & Toval, A. (2015). Empirical studies on usability of mHealth apps: a systematic literature review. Journal of Medical Systems, 39(2), 1.

Zarrintan, S. (2020). Surgical operations during the COVID-19 outbreak: Should elective surgeries be suspended? International Journal of Surgery, 78, 5–6. https://doi.org/10.1016/j.ijsu.2020.04.005

*Zhang, H., Penninger, J. M., Li, Y., Zhong, N., & Slutsky, A. S. (2020). Angiotensin-converting enzyme 2 (ACE2) as a SARS-CoV-2 receptor: molecular mechanisms and potential therapeutic target. Intensive Care Medicine, 1–5.

*Zhang, L., & Liu, Y. (2020). Potential interventions for novel coronavirus in China: A systematic review. Journal of Medical Virology.

*Zhang, W. R., Wang, K., Yin, L., Zhao, W. F., Xue, Q., Peng, M., Min, B. Q., Tian, Q., Leng, H. X., Du, J. L., Chang, H., Yang, Y., Li, W., Shangguan, F. F., Yan, T. Y., Dong, H. Q., Han, Y., Wang, Y. P., Cosci, F., & Wang, H. X. (2020). Mental Health and Psychosocial Problems of Medical Health Workers during the COVID–19 Epidemic in China [Article in Press]. Psychotherapy and Psychosomatics, 1–9. https://doi.org/10.1159/000507639

*Zhang, Y., & Ma, Z. F. (2020). Impact of the COVID-19 Pandemic on Mental Health and Quality of Life among Local Residents in Liaoning Province, China: A Cross-Sectional Study [Article]. International Journal of Environmental Research and Public Health, 17(7). https://doi.org/10.3390/ijerph17072381

*Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., Zhao, X., Huang, B., Shi, W., & Lu, R. (2020). A novel coronavirus from patients with pneumonia in China, 2019. New England Journal of Medicine.

*Zhu, S., Wu, Y., Zhu, C. Y., Hong, W. C., Yu, Z. X., Chen, Z. K., Chen, Z. L., Jiang, D. G., & Wang, Y. G. (2020). The immediate mental health impacts of the COVID–19
pandemic among people with or without quarantine managements. Brain, behavior, and immunity. https://doi.org/10.1016/j.bbi.2020.04.045
Psihološki simptomi Covid-19 epidemije: Sistemsatski pregled trenutnih podataka

SeyedAhmad SeyedAlinaghi¹, Amirali Karimi², Parnian Shobeiri², Ali Nowroozi², Esmaeil Mehraeen³, Amir Masoud Afsahi⁴, and Alireza Barzegary⁵

¹Iranian Research Center for HIV/AIDS, Iranian Institute for Reduction of High-Risk Behaviors, Tehran University of Medical Sciences, Tehran, Iran. ²School of medicine, Tehran University of Medical Sciences, Tehran, Iran. ³Department of Health Information Technology, Khalkhal University of Medical Sciences, Khalkhal, Iran. ⁴Department of Radiology, School of Medicine, University of California, San Diego (UCSD), California, USA. ⁵School of medicine, Islamic Azad University, Tehran, Iran.

Nakon izbijanja (epidemije, prim. prev.) Kovid–19, nekoliko objavljenih izveštaja o porastu psiholoških problema je skrenulo pažnju na ovo područje i rasplamsalo kontroverze. Naš cilj je da se pozabavimo pitanjima iz ove oblasti kako bi pružili informacije za robuniji pristup (u budućim istraživanjima, prim. prev). Sproveli smo sistematsku pretragu baza podataka: PubMed, Embase, Scopus, UpToDate, Science direct i Web of Science. U pretragu smo uključili originalne naučne radove, apstrakte, izveštaje i pisma uredniku koji su napisani na engleskom jeziku i objavljeni u periodu od decembra 2019 do aprila 2020. Nakon procene naslova i asptrakta da bismo izabrali najrelevantnije članke prema kriterijumima za uključenje, tj. isključenje, pristupili smo kvalitativnoj proceni odabranih članaka. Izabrani članci su temeljno pročitani u celini da bi se izdvojili važni nalazi. Pregled dostupne literature je ukazao da se psihološki simptomi tokom epidemije Covid–19 mogu javiti kod većine ljudi, uključujući medicinsko osoblje i pacijente. Identificovali smo 24 potencijalna psihološka simptoma virusa SARS-CoV–2. Pregled izabranih članaka nam ukazuje da postoji rizik od pojave psiholoških simptoma u opštoj populaciji za vreme trajanja epidemije, ali su im medicinski radnici koji se nalaze na prvoj liniji pružanja zdravstvene zaštite podložniji. Anksoznost, depresija, stres i problemi sa spavanjem su se pokazali kao najčešći psihološki simptomi koji prate ovu pandemiju COVID–19. Preporuka je da se u budućim studijama evaluiraju praktične intervencije namenjene redukciji psiholoških simptoma, naročito kod osoba koje rade u zdravstvenoj zaštiti za vreme pandemije COVID–19.

Ključne reči: Psihološki simptomi, mentalni simptomi, psihijatrijska bolest, koronavirus, Covid–19, SARS-CoV–2

RECEIVED: 03.07.2020.

REVISION RECEIVED: 10.11.2020.

ACCEPTED: 10.11.2020.
| NO. | Question                                                                                           |
|-----|---------------------------------------------------------------------------------------------------|
| 1   | Does the study address any research question(s) or objective(s)?                                    |
| 2   | Does the study provide any theoretical framework for the evaluation method?                         |
| 3   | Does the theoretical framework of the study include any health promotion theory?                    |
| 4   | Does the study provide a timeframe for the data collection?                                        |
| 5   | Does the study identify the country where the search was conducted?                                 |
| 6   | Does the study mention that the reviewed psychological symptoms were downloaded for evaluation?     |
| 7   | Does the study discuss the selection criteria for psychological symptoms to be included or excluded for review? |
| 8   | Does the study provide a clear description of the evaluation method?                                |
| 9   | Are there at least two independent data extractors with a consensus procedure in place in case of disagreement? |
| 10  | Is a list of the psychological symptoms reviews provided?                                            |
| 11  | Does the study discuss the findings of the evaluation?                                               |
| 12  | Does the study look at the reviewed disease consequences to promote or enable behavioral change?     |
| 13  | Does the study discuss any limitations?                                                             |
| 14  | Does the study provide any future recommendations in general?                                       |
| 15  | Does the study state any conflict of interest?                                                      |
Figure 1.
PRISMA flow diagram of the articles selection process.

- Records identified through database searching (n = 254)
- Additional records identified through other sources (n = 5)
- Duplicated articles removed (n = 103)
- Records screened (n = 156)
- Records excluded (n = 96)
- Full-text articles assessed for eligibility (n = 60)
- Full-text articles excluded, with reasons (n = 19)
- Studies included in qualitative synthesis (n = 41)
Table 2

Identified psychological symptoms of COVID–19

| ID | The first author (reference) | Type of study | Country | Study Population | Psychological symptoms | Other |
|----|-------------------------------|---------------|---------|------------------|------------------------|-------|
|    |                               |               |         |                  |                         |       |
| 1  | Wang, C.(Wang et al., 2020)   | Cross-sectional | China   | N = 1304, General population | Yes | Yes | Yes | - | - |
| 2  | Cao, J.(Cao et al., 2020)     | Cross-sectional | China   | N = 37, (43.24%) doctors, (51.35%) nurses, (5.41%) clinical technicians | Yes | Yes | Yes | Yes | Emotional distress |
| 3  | Huang, J. Z. (Huang et al., 2020) | Cross-sectional | China   | N = 246, medical staff (30.4%) doctors, (69.6%) nurses | Yes | Yes | - | - | Post-traumatic stress disorder (PTSD) |
| 4  | Lee, S. A.(Lee, 2020)         | Cross-sectional | USA     | N = 775, General population | - | Yes | - | - | - |
| 5  | Ahmed, M. Z. (Ahmed et al., 2020) | Cross-sectional | China   | N = 1074, General population | - | Yes | Yes | - | Alcohol use |
| 6  | Lai, J.(Lai et al., 2020)     | Cross-sectional | China   | N = 1257, Medical staff: (39.2%) physicians, (60.8%) nurses | - | Yes | Yes | Yes | Distress |
| 7  | Araujo, F. J. O.(Araujo et al., 2020) | Review | International Students | Yes | Yes | Yes | - | - | |
| 8  | Huang, Y.(Huang & Zhao, 2020) | Cross-sectional | China   | N = 7236, General population | - | Yes | Yes | Yes | - |
| 9  | Lin, C. (Lin et al., 2020)    | Cross-sectional | China   | N = 13, medical staff | - | - | - | - | Work-related worries |
| 10 | Gao J (Gao et al., 2020)      | Cross-sectional | China   | N = 4827, General | - | Yes | Yes | - | - |
| ID  | The first author (reference)                     | Type of study | Country  | Study Population                                      | Stress | Anxiety | Depression | Sleep disturbance symptoms | Other        |
|-----|------------------------------------------------|---------------|----------|------------------------------------------------------|--------|---------|------------|----------------------------|--------------|
| 11  | Liu, S. (Liu et al., 2020)                      | Review        | China    | $N = 1563$, medical staff                            | Yes    | Yes     | Yes        | Yes                        | -            |
| 12  | Bo, H. X. (Bo et al., 2020)                     | Cross-sectional | China    | $N = 714$, recruited clinically-stable COVID–19 patients | Yes    | -       | -          | -                          | PTSD         |
| 13  | Cai, H. (Cai et al., 2020)                      | Cross-sectional | China    | $N = 534$, front-line medical workers               | Yes    | -       | -          | -                          | -            |
| 14  | Liang, Y. (Liang et al., 2020)                  | Cross-sectional | China    | $N = 59$, medical workers: 38(64.4%) in COVID–19 associated departments and (35.6%) in other departments | -      | Yes     | Yes        | -                          | -            |
| 15  | Chung, J. P. Y., (Chung & Yeung, 2020)          | Cross-sectional | Hong Kong | $N = 69$, medical workers: (4.3%) doctors, (34.8%) nurses; (60.9%) other groups | -      | -       | Yes        | -                          | -            |
| 16  | Kang, L. (Kang et al., 2020)                    | Cross-sectional | China    | $N = 944$, medical workers: (18.4%) doctors, (81.6%) nurses | -      | Yes     | Yes        | Yes                        | Distress     |
| 17  | Chen, J. (Chen, 2020)                           | Cross-sectional | China    | $N = 584$, Young people aged 14–35                  | Yes    | -       | -          | -                          | PTSD, Negative coping styles |
| 18  | Zhu, N. (Zhu et al., 2020)                      | Cross-sectional | China    | $N = 17865$, General population                     | -      | Yes     | -          | -                          | Anger, Cognitive problems |
| 19  | Cao, W. (W. Cao et al., 2020)                   | Cross-sectional | China    | $N = 7143$, medical college students                | -      | Yes     | -          | -                          | -            |
| 20  | Zhang L. (Zhang & et al., 2020)                 | Cross-sectional | China    | $N = 740$, (28.9%) general                          | -      | -       | -          | -                          | Vicarious dramatization |
| ID | The first author (reference) | Type of study | Country | Study Population | Psychological symptoms | Other |
|----|----------------------------|---------------|---------|------------------|------------------------|-------|
|    |                            |               |         |                  | Stress | Anxiety | Depression | Sleep disturbance symptoms | Other |
| 21 | Liu, 2020                  | sectional     |         | public, (31.6%) frontline nurses, (39.5%) non-front-line nurses | - | - | - | - | Distress, loneliness |
| 22 | Losada-Baltar A (Losada-Baltar et al., 2020) | Cross-sectional | Spain | N = 1310, General population | - | Yes | Yes | - | Fear |
| 23 | Lu W (Lu et al., 2020)     | Cross-sectional | China | N = 2299, 2042 medical staff, and 257 administrative staff | - | Yes | Yes | - | Cyclothymic, Distress |
| 24 | Moccia L (Moccia et al., 2020) | Cross-sectional | Italy | N = 500, General population | Yes | Yes | Yes | - | Paranoid, Distress related to social media |
| 25 | Roy D (Roy et al., 2020)   | Cross-sectional | India | N = 662, General population | - | - | - | Yes | Distress related to social media |
| 26 | Tan BY Q (Tan et al., 2020) | Cross-sectional | Singapore | N = 470, Nonmedical Health Care Personnel (n = 174), Medical Health Care Personnel (n = 296) | Yes | Yes | Yes | - | PTSD |
| 27 | Tian F (Tian et al., 2020) | Cross-sectional | China | N = 1060, General population | - | Yes | Yes | Yes | Obsessive compulsion, Interpersonal sensitivity, Psychoticism, Disturbances in appetite, Phobic anxiety, Paranoid ideation, Hostility, Distress |
| 28 | Wang C (Wang et al., 2020) | Longitudinal study | China | N = 1738, General population | Yes | Yes | Yes | - | - |
| 29 | Wang M (Wang et al., 2020) | Cross-sectional | China | N = 600, General population | - | Yes | Yes | - | - |
| 30 | Wu W (Wu et al., 2020)    | Cross-sectional | China | N = 4268, n = 2110 medical staff, n = 2158 | Yes | - | - | Yes | Thoughts of being in danger |
| ID | The first author (reference) | Type of study | Country | Study Population | Psychological symptoms | Stress | Anxiety | Depression | Sleep disturbance symptoms | Other |
|----|----------------------------|---------------|---------|------------------|------------------------|--------|--------|-----------|--------------------------|-------|
| 30 | To K (To et al., 2020)     | Cross-sectional | China   | $N = 10$, all nurses | -                     | -      | -      | -         | -                        | Psychological needs of existence, relatedness & growth |
| 31 | Yuan R (Yuan et al., 2020) | Cross-sectional | China   | $N = 100$, $n = 50$ family of patients hospitalized during the epidemic period, $n = 50$ family of patients hospitalized during the epidemic period | - | Yes | Yes | - | Dream anxiety |
| 32 | Yuan S (Yuan et al., 2020) | Cross-sectional | China   | $N = 939$, General population | - | Yes | - | Yes | Problems in emotional state & behavior |
| 33 | Zhang Hai (Zhang et al., 2020) | Cross-sectional | China   | $N = 107$, $n = 57$ Patients who experienced COVID-19 infection, $n = 50$ Individuals under quarantine | - | Yes | Yes | - | - |
| 34 | Zhang WR (Zhang et al., 2020) | Cross-sectional | China   | $N = 2182$, Medical health workers ($n = 927$) Nonmedical health workers ($n = 1,255$) | - | Yes | Yes | Yes | Somatization, Obsessive-compulsive symptoms |
| 35 | Zhang Y (C. Huang et al., 2020) | Cross-sectional | China   | $N = 263$, General population | Yes | - | - | - | Apprehensiveness, Hopelessness, Fear |
| 36 | Zhu S (Zhu et al., 2020)   | Cross-sectional | China   | $N = 2279$, $n = 1443$ Participants with quarantine, $n = 836$ Participants without quarantine | - | Yes | Yes | - | - |
| 37 | Moghanibashi-Mansourieh    | Cross-sectional | Iran    | $N = 10754$, $n = 7173$ lived in high prevalence | - | Yes | - | - | - |
| ID | The first author (reference) | Type of study | Country | Study Population | Psychological symptoms |
|----|-------------------------------|---------------|---------|-----------------|------------------------|
|    |                               |               |         |                 | Stress | Anxiety | Depression | Sleep disturbance symptoms | Other |
| 38 | Özdin SiÖzdin & Bayrak Özdin, 2020) | Cross-sectional | Turkey | $N = 343, n = 278$ lived in an urban area and $n = 71$ of whom lived with another person aged above 60 | - | Yes | Yes | - | - |
| 39 | Mazza C(Mazza et al., 2020) | Cross-sectional | Italy | $N = 2812$, General population | Yes | Yes | Yes | - | - |
| 40 | Sadiković S(Sadiković et al., 2020) | Cross-sectional | Serbia | $N = 444$, General population | - | - | - | - | Longitudinal changes in worry, fear, boredom, and anger/annoyance |
| 41 | González-Sanguino C(González-Sanguino et al., 2020) | Cross-sectional | Spain | $N = 3480$, General population | - | Yes | Yes | - | post-traumatic symptoms |
Figure 2.
Distribution of participants in the surveyed studies
Figure 3.
Distribution of psychological consequences based on the investigation of the presented publications

- Stress
- Anxiety
- Depression
- Sleep disorders
- Distress
- Post-traumatic stress symptoms
- Fear
- Obsessive compulsion
- Other disorders