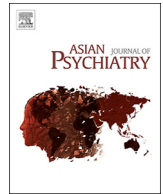




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COVID-19 and mental health: A review of the existing literature

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ABSTRACT

The COVID-19 pandemic is a major health crisis affecting several nations, with over 720,000 cases and 33,000 confirmed deaths reported to date. Such widespread outbreaks are associated with adverse mental health consequences. Keeping this in mind, existing literature on the COVID-19 outbreak pertinent to mental health was retrieved via a literature search of the PubMed database. Published articles were classified according to their overall themes and summarized. Preliminary evidence suggests that symptoms of anxiety and depression (16–28%) and self-reported stress (8%) are common psychological reactions to the COVID-19 pandemic, and may be associated with disturbed sleep. A number of individual and structural variables moderate this risk. In planning services for such populations, both the needs of the concerned people and the necessary preventive guidelines must be taken into account. The available literature has emerged from only a few of the affected countries, and may not reflect the experience of persons living in other parts of the world. In conclusion, sub-syndromal mental health problems are a common response to the COVID-19 pandemic. There is a need for more representative research from other affected countries, particularly in vulnerable populations.

1. Introduction

Originating as a cluster of unexplained cases of pneumonia in Wuhan, China, novel coronavirus disease – officially designated as COVID-19 by the World Health Organization – has reached the level of a pandemic, affecting countries all across the world. To date (March 30th, 2020), over 720,000 confirmed cases and 33,000 deaths attributable to this disease have been reported. In the wake of this global health crisis, stringent public health measures have been implemented to curtail the spread of COVID-19 (Adhikari et al., 2020).

Widespread outbreaks of infectious disease, such as COVID-19, are associated with psychological distress and symptoms of mental illness (Bao et al., 2020). Psychiatrists across the world should be aware of these manifestations, their correlates, and strategies to manage them that encompass both the needs of specific populations (Yang et al., 2020) and the precautionary measures necessary to contain the spread of COVID-19 (Liu et al., 2020a). They should also be aware of lacunae in the existing literature, which may need to be filled in over time through more widespread clinical experience and research.

With the above objectives in mind, the current review was designed to summarize the existing literature addressing mental health concerns related to the COVID-19 pandemic.

2. Methodology

2.1. Search methodology and article selection

The current article is a narrative review of the existing literature on mental health symptoms and interventions relevant to the COVID-19 pandemic. A search of the PubMed electronic database was undertaken using the search terms “novel coronavirus”, “COVID-19”, “nCoV”, “mental health”, “psychiatry”, “psychology”, “anxiety”, “depression” and “stress” in various permutations and combinations. A total of 47 citations were retrieved using this method. On reviewing the above citations, 19 articles were excluded: 3 because they were available only in the Chinese language, and 16 because they dealt with other aspects of the COVID-19 outbreak, such as drug therapy, animal models, public health and preventive measures, and organization of health care systems. A careful review of these 16 articles revealed no material relevant to mental health.

2.2. Methodological and thematic analysis of selected articles

The remaining 28 articles were included in this review. Of these 28 articles, only a minority (n = 4) could be genuinely labelled as “original research”. All these four studies were cross-sectional and observational in design. The remaining 24 articles consisted of letters to the editor (n = 16) and editorials or commentary related to mental

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health and COVID-19 (n = 8).

As it was not possible to conduct a formal systematic review or meta-analysis given the nature of the above publications, it was instead decided to conduct a narrative review, giving priority to the few observational studies available and briefly summarizing the salient themes from the other publication types. Five broad themes were identified across the 26 publications, and were used to organize the review: (a) observational studies reporting on mental health symptoms in particular populations, (b) commentary and correspondence broadly addressing the psychological impact of COVID-19 on the population, (c) commentary and correspondence addressing the impact of COVID-19 on healthcare workers, (d) commentary and correspondence specifically related to high-risk or vulnerable populations, and (e) commentary and correspondence related to methods of delivering mental health care during the COVID-19 outbreak.

The majority of published articles (18/28 of all articles; 64.3%) and all the observational studies (4/4; 100%) were from Chinese centres. There were two publications each from Iran and Canada; one each from Brazil, Singapore, India and Japan; and two publications with no specified country of origin.

3. Results

3.1. Observational studies on mental health problems related to COVID-19

Four studies, all from Chinese centres, examined the frequency of specific mental health-related variables in persons affected by the COVID-19 outbreak (Wang et al., 2020; Xiao et al., 2020a; Li et al., 2020; Xiao et al., 2020b). Their results are summarized in the Table below (Table 1).

As seen in the above results, only one study has provided rough estimates of the frequencies of individual mental health symptoms, with anxiety being the commonest. Anxiety was associated with impaired sleep in both studies examining this link (Xiao et al., 2020a, b). In the population-based study, female gender, being a student, having symptoms suggestive of COVID-19, and poor perceived health were associated with higher rates of anxiety and depression; on the other hand, the availability of accurate information and the use of specific preventive measures, such as hand-washing, seemed to mitigate these effects (Wang et al., 2020). No descriptive studies of this sort could be retrieved from other countries.

3.2. Literature addressing the mental health impact of COVID-19 on the general population

Eight publications, including commentaries (n = 4) and correspondence (n = 5) addressed the potential mental health impact of COVID-19 on the general population, based on literature from previous disease outbreaks or specified theoretical models. There was greater geographical diversity in this group of publications, with papers originating from China, Canada, Iran, Japan, Singapore and Brazil.

Two of these papers examined the likely impact of the COVID-19 pandemic in specific countries. One of these, from Iran (Zandifar and Badrfam, 2020) highlighted the role of unpredictability, uncertainty, seriousness of the disease, misinformation and social isolation in contributing to stress and mental morbidity. The authors highlighted the need for both mental health services, particularly for vulnerable populations, and the strengthening of social capital to reduce the adverse psychological impact of the outbreak. Another, from Japan (Shigemura et al., 2020), emphasised the economic impact of COVID-19 and its effects on well-being, as well as the likely high levels of fear and panic behaviour, such as hoarding and stockpiling of resources, in the general population. This paper also identified populations at higher risk of adverse mental health outcomes, including patients with COVID-19 and their families, individuals with existing physical or psychiatric morbidity, and healthcare workers.

Table 1
Observational studies of mental health concerns related to COVID-19.

Author	Country of origin	Population(s) studied	Methodology	Study instruments	Results
Wang et al., 2020	China	General population (n = 1210)	Online survey	Depression, Anxiety and Stress Scale (DASS-21); Impact of Event Scale-Revised (IES-R)	16.5% moderate to severe depressive symptoms; 28.8% moderate to severe anxiety symptoms; 8.1% moderate to severe stress
Xiao et al., 2020a	China	Medical staff treating COVID-19 patients (n = 180)	Cross-sectional, self-rated questionnaire	Self-Rating Anxiety Scale (SAS); General Self-Efficiency Scale (SES); Stanford Acute Stress Reaction Questionnaire (SASR); Pittsburgh Sleep Quality Index (PSQI); Social Support Rate Scale (SSRS)	Mean anxiety scores 55.3 ± 14.2 ; anxiety positively correlated with stress and negatively with sleep quality, social support and self-efficiency (p < .05, all correlations)
Li et al., 2020	China	General public (n = 214); front-line nurses (n = 234); non-front line nurse (n = 292)	Cross-sectional, self-rated survey using a mobile app	Chinese version of the Vicarious Traumatization Scale	Traumatization related to COVID-19 higher among non-front line than front-line nurses (p < .001); traumatization among the general public higher than for front-line nurses (p < .005) but not non-front-line nurses
Xiao et al., 2020b	China	Individuals in self-isolation for 14 days (n = 170)	Cross-sectional, self-rated questionnaire	Self-Rating Anxiety Scale (SAS); Stanford Acute Stress Reaction Questionnaire (SASR); Pittsburgh Sleep Quality Index (PSQI); Personal Social Capital Scale (PSCI-16)	Mean anxiety score 55.4 ± 14.3 ; Anxiety positively correlated with stress and negatively with sleep quality and social capital; social capital positively correlated with sleep quality. (p < .05, all correlations)

Of the remaining papers, one pointed out that the wide scope and spread of COVID-19 could lead to a true mental health crisis, especially in countries with high case loads (Dong and Bouey, 2020) which would require both large-scale psychosocial crisis interventions, and the incorporation of mental health care in disaster management plans in the future. In a related report (Duan and Zhu, 2020) it was pointed out that while Western countries have incorporated psychological interventions into their protocols for disease outbreaks, this has not yet happened in countries such as China, leading to the emergence and persistence of stress-related disorders in affected persons. This paper also offered suggestions for the development of intervention strategies, which will be summarized in section 3.5 below. In contrast, Bao et al. (2020) highlighted the services that were already being provided in China, and also provided a list of strategies for the general public to minimize outbreak-related stress: (1) assessment of the accuracy of information, (2) enhancing social support, (3) reducing the stigma associated with the disease, (4) maintaining as normal a life as feasible while adhering to safety measures, (5) use of available psychosocial services, particularly online services, when needed. Such methods, in their opinion, would empower society to handle the COVID-19 outbreak in an adaptive manner. Similar strategies were reiterated in a paper from Singapore (Ho et al., 2020) which also discussed the role of improved screening for mental disorders, improving links between community and hospital services, and providing accurate information to the general public in order to minimize maladaptive responses such as “panic” and paranoia regarding the disease and its transmission. Finally, a brief review paper (Lima et al., 2020) highlighted the role of anxiety as the dominant emotional response to an outbreak, and the need for adequate training of healthcare personnel and the optimal use of technological advances to deliver mental health care.

In contrast to the above literature on practical considerations, two papers from Canada (Asmundson and Taylor, 2020a, b) have discussed the mental health impact of COVID-19 from the point of view of *health anxiety*. Health anxiety, which arises from the misinterpretation of perceived bodily sensations and changes, can be protective in everyday life. However, during an outbreak of infectious disease, particularly in the presence of inaccurate or exaggerated information from the media, health anxiety can become excessive. At an individual level, this can manifest as maladaptive behaviours (repeated medical consultations, avoiding health care even if genuinely ill, hoarding particular items); at a broader societal level, it can lead to mistrust of public authorities and scapegoating of particular populations or groups. The authors underline the need for evidence-based research into health anxiety and its determinants, so that valid individual- and population-level strategies can be developed to minimize it in the face of the COVID-19 pandemic and future outbreaks of a similar nature.

3.3. Literature addressing the mental health impact of COVID-19 on healthcare workers

As discussed briefly in section 3.1, healthcare workers are at a significant risk of adverse mental health outcomes during the COVID-19 outbreak. Reasons for this include long working hours, risk of infection, shortages of protective equipment, loneliness, physical fatigue, and separation from families (Kang et al., 2020).

Excluding observational studies, three papers, all from Chinese centres, have addressed this topic. One of these vividly illustrates the gap between planned services at a given hospital and the actual needs of healthcare workers (Chen et al., 2020). This centre had developed a three-pronged approach to address the mental health of their staff: development of an intervention team which would design online materials, implementation of a psychological assistance hotline, and group activities for stress reduction. However, this programme met with reluctance from the healthcare workers themselves. After direct interaction with the workers, this programme was redesigned to include the provision of a rest area, care for basic physical needs such as food,

training on the care of COVID-19 patients, information on protective measures, leisure activities, and periodic visits to the rest area by a counsellor. This resulted in greater satisfaction among healthcare workers, and highlights the need for ongoing feedback and modification of such programmes if they are not acceptable to the workers themselves. Liu et al. (2020b) pointed out that mental health professionals may need to work especially closely with those working in critical care units, to minimize stress levels and reduce the risk of depression, while Kang et al. (2020) noted the positive impact of telephone helplines for healthcare workers to specifically address mental health problems. To date, no literature pertaining to healthcare workers from other countries has been published.

3.4. Literature related to the mental health risks of COVID-19 in vulnerable populations

Seven publications (correspondence, n = 6; commentary, n = 1) have identified particular populations that may be more vulnerable to the mental health impact of the COVID-19 pandemic, and some of these have provided suggestions regarding interventions and service provision. The vulnerable groups identified by these authors include older adults (Yang et al., 2020), the homeless (Tsai and Wilson, 2020), migrant workers (Liem et al., 2020), the mentally ill (Yao et al., 2020a; Zhu et al., 2020), pregnant women (Rashidi Fakari and Simbar, 2020) and Chinese students studying overseas (Zhai and Du, 2020).

Of particular interest to practicing psychiatrists are the two reports from China (Yao et al., 2020, Zhu et al., 2020) regarding COVID-19 and patients with pre-existing psychiatric illness. To date, a single outbreak of COVID-19, affecting around 50 patients and 30 staff, has been reported in a psychiatric hospital, and this was contained by strict quarantine. Reasons for this may have included overcrowding, lack of general medical facilities in psychiatric hospitals, lack of knowledge among mental health professionals, and difficulty in obtaining the cooperation of patients for preventive measures, especially those suffering from psychotic disorders (Zhu et al., 2020). Conversely, patients with pre-existing mental disorders may be at higher risk of relapse or new episodes of their disorder due to the stress associated with the COVID-19 outbreak (Yao et al., 2020a). During this period, it is crucial that psychiatrists familiarize themselves with screening and triage procedures, and work closely with physicians and public health specialists to minimize the risks that their patients face (Zhu et al., 2020).

With regards to the other populations listed above, specific issues raised include the high rates of pre-existing depressive symptoms in the elderly and their lack of access to mental health services (Yang et al., 2020); the fears of involuntary admission or imprisonment among the homeless which may act as a barrier to mental health care (Tsai and Wilson, 2020); the need for outreach and social support among migrant worker populations to reduce the risk of common mental disorders (Liem et al., 2020); the relationship between COVID-19 – related stress and anxiety and adverse maternal and neonatal outcomes (Rashidi Fakari and Simbar, 2020); and the potential discrimination and stigmatization faced by Chinese students overseas during the pandemic, leading to anxiety and stress-related disorders (Zhai and Du, 2020). In all these cases, close collaboration between psychiatrists and specialties from other branch of medicine, as well as with local authorities and health workers in the community, is essential.

3.5. Therapeutic interventions and strategies

Five papers (correspondence, n = 2; commentary, n = 3) have directly addressed the use of specific strategies to deliver mental health care to persons affected by the COVID-19 epidemic (Duan and Zhu, 2020; Liu et al., 2020a; Xiao, 2020; Zhou et al., 2020; Yao et al., 2020b). In addition, a paper from India has discussed the importance of psychiatrists during the COVID-19 pandemic in general terms. This paper identified six important roles for the psychiatrist: a) education of

the public about the common psychological effects of a pandemic, b) motivating the public to adopt strategies for disease prevention and health promotion, c) integrating their services with available health care, d) teaching problem-solving strategies to cope with the current crisis, e) empowering patients with COVID-19 and their caregivers, and f) provision of mental health care to healthcare workers (Banerjee, 2020).

With reference to more specific therapeutic strategies, proposals include the development of teams of specialists qualified to address emotional distress (Duan and Zhu, 2020); the training of community health personnel in basic aspects of mental health care (Duan and Zhu, 2020); the use of online surveys to assess the scope of mental health problems (Liu et al., 2020b); the development of online materials for mental health education (Liu et al., 2020a); the provision of online counselling and self-help services (Liu et al., 2020b); the use of structured letters as a form of asynchronous telepsychiatry consultation (Xiao, 2020); the development of synchronous telemedicine services for diagnostic purposes as well as counselling (Zhou et al., 2020); and the need to make online mental health services accessible to individuals from lower socioeconomic strata (Yao et al., 2020b). Such strategies offer the hope of providing mental health services in an easily accessible manner without any increase in infection risk. However, they depend crucially on the availability of trained manpower and infrastructure, and it is not known to what extent these approaches will be accepted by the general public. Moreover, they have not yet been tested or validated in the respective target populations.

4. Conclusions and further directions

Though there are few large-scale observational studies available in this field to date, it is clear that the COVID-19 pandemic has led to a vigorous and multifaceted response from psychiatrists and allied professionals, and that mental health is clearly being taken into consideration at multiple levels – in the general population, among healthcare workers, and in vulnerable populations. Though the quality of evidence in the available literature is relatively low, it still contains numerous valuable observations and suggestions for all professionals working in this field, whether they are associated with psychiatric or general hospitals or working in the community. As the number of patients affected by this pandemic continues to increase, the psychiatric profession – particularly in Asian countries – faces both a challenge and an opportunity; the challenge of addressing the numerous barriers and limitations identified in the above literature, but also the opportunity to implement those suggestions or recommendations which are feasible at a local or regional level. The long-term mental health impact of COVID-19 may take weeks or months to become fully apparent, and managing this impact requires concerted effort not just from psychiatrists but from the health care system at large (Maunder, 2009). There is a need for further research, even in the form of preliminary or pilot studies, to assess the scope of this pandemic in other countries, particularly in those where mental health infrastructure is less developed and the impact is likely to be more severe (Duan and Zhu, 2020). Researchers should also attempt to assess the impact of COVID-19 on other vulnerable populations, such as children and adolescents, those in remote or rural areas who face barriers in accessing health care, and those belonging to lower socio-economic strata. Further, there is a need to develop mental health interventions which are time-limited, culturally sensitive, and can be taught to healthcare workers and volunteers. Once developed, such interventions should be tested, so that information regarding effective therapeutic strategies can be widely disseminated among those working in this field.

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Declaration of Competing Interest

The authors declare that there are no conflicts of interest.

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References

- Adhikari, S.P., Meng, S., Wu, Y.-J., Mao, Y.-P., Ye, R.-X., Wang, Q.-Z., Sun, C., Sylvia, S., Rozelle, S., Raat, H., Zhou, H., 2020. Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. *Infect. Dis. Poverty* 17 (9), 29.
- Asmundson, G.J.G., Taylor, S., 2020a. Coronaphobia: fear and the 2019-nCoV outbreak. *J. Anxiety Disord.* 70, 102196 [Epub ahead of print].
- Asmundson, G.J.G., Taylor, S., 2020b. How health anxiety influences responses to viral outbreaks like COVID-19: what all decision-makers, health authorities, and health care professionals need to know. *J. Anxiety Disord.* 71, 102211 [Epub ahead of print].
- Banerjee, D., 2020. The COVID-19 outbreak: crucial role the psychiatrists can play. *Asian J. Psychiatr.* 51, 102014 [Epub ahead of print].
- Bao, Y., Sun, Y., Meng, S., Shi, J., Lu, L., 2020. 2019-nCoV epidemic: address mental health care to empower society. *Lancet* 22 (395), e37–e38.
- Chen, Q., Liang, M., Li, Y., Guo, J., Fei, D., Wang, L., He, L., Sheng, C., Cai, Y., Li, X., Wang, J., Zhang, Z., 2020. Mental health care for medical staff in China during the COVID-19 outbreak. *Lancet Psychiatry* 7 (4), e15–e16.
- Dong, L., Bouey, J., 2020. Public mental health crisis during COVID-19 pandemic, China. *Emerg. Infect. Dis.* 23 (26). <https://doi.org/10.3201/eid2607.200407>. [Epub ahead of print].
- Duan, L., Zhu, G., 2020. Psychological interventions for people affected by the COVID-19 epidemic. *Lancet Psychiatry* 7 (4), 300–302.
- Li, Z., Ge, J., Yang, M., Feng, J., Qiao, M., Jiang, R., Bi, J., Zhan, G., Xu, X., Wang, L., Zhou, Q., Zhou, C., Pan, Y., Liu, S., Zhang, H., Yang, J., Zhu, B., Hu, Y., Hashimoto, K., Jia, Y., Wang, H., Wang, R., Liu, C., Yang, C., 2020. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav. Immun.* 10 (20), S30309.
- Ho, C.S., Chee, C.Y., Ho, R.C., 2020. Mental health strategies to combat the psychological impact of COVID-19 beyond paranoia and panic. *Ann. Acad. Med. Singapore* 49 (1), 1–3.
- Kang, L., Li, Y., Hu, S., Chen, M., Yang, C., Yang, B.X., Wang, Y., Hu, J., Lai, J., Ma, X., Chen, J., Guan, L., Wang, G., Ma, H., Liu, Z., 2020. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry* 7 (3), e14.
- Lima, C.K.T., Carvalho, P.M.M., Lima, I.A.A.S., Nunes, J.V.A.O., Saraiva, J.S., de Souza, R.I., da Silva, C.G.L., Neto, M.L.R., 2020. The emotional impact of Coronavirus 2019-nCoV (new coronavirus disease). *Psychiatry Res.* 287, 112915 [Epub ahead of print].
- Liem, A., Wang, C., Wariyanti, Y., Latkin, C.A., Hall, B.J., 2020. The neglected health of international migrant workers in the COVID-19 epidemic. *Lancet Psychiatry* 7 (4), e20.
- Liu, S., Yang, L., Zhang, C., Xiang, Y.T., Liu, Z., Hu, S., Zhang, B., 2020a. Online mental health services in China during the COVID-19 outbreak. *Lancet Psychiatry* 7 (4), e17–e18.
- Liu, Y., Li, J., Feng, Y., 2020b. Critical care response to a hospital outbreak of the 2019-nCoV infection in Shenzhen, China. *Crit. Care* 24 (1), 56.
- Maunder, R.G., 2009. Was SARS a mental health catastrophe? *Gen. Hosp. Psychiatry* 31 (2009), 316–317.
- Rashidi Fakari, F., Simbar, M., 2020. Coronavirus pandemic and worries during pregnancy; a letter to the editor. *Arch. Acad. Emerg. Med.* 8 (1), e21.
- Shigemura, J., Ursano, R.J., Morganstein, J.C., Kurosawa, M., Benedek, D.M., 2020. Public responses to the novel 2019 coronavirus (2019-nCoV): mental health consequences and target populations. *Psychiatry Clin. Neurosci.* (February). <https://doi.org/10.1111/pcn.12988>. [Epub ahead of print].
- Tsai, J., Wilson, M., 2020. COVID-19: a potential public health problem for homeless populations. *Lancet Public Health* Mar 11 S2468-2667 (20) 30053-0. [Epub ahead of print].
- 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. *Int. J. Environ. Res. Public Health* 17 (5), E1729.
- 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.
- Xiao, H., Zhang, Y., Kong, D., Li, S., Yang, N., 2020a. The effects of social support on sleep quality of medical staff treating patients with coronavirus disease 2019 (COVID-19) in January and February 2020 in China. *Med. Sci. Monit.* 26, e923549.

- Xiao, H., Zhang, Y., Kong, D., Li, S., Yang, N., 2020b. Social capital and sleep quality in individuals who self-isolated for 14 days during the coronavirus disease 2019 (COVID-19) outbreak in January 2020 in China. *Med. Sci. Monit.* 26, e923921.
- Yang, Y., Li, W., Zhang, Q., Zhang, L., Cheung, T., Xiang, Y.-T., 2020. Mental health services for older adults in China during the COVID-19 outbreak. *Lancet Psychiatry* 7 (4), e19.
- Yao, H., Chen, J.H., Xu, Y.F., 2020b. Rethinking online mental health services in China during the COVID-19 epidemic. *Asian J. Psychiatr.* 51, 102015 [Epub ahead of print].
- Zandifar, A., Badrfam, R., 2020. Iranian mental health during the COVID-19 epidemic. *Asian J. Psychiatr.* 51, 101990.
- Zhai, Y., Du, X., 2020. Mental health care for international Chinese students affected by the COVID-19 outbreak. *Lancet Psychiatry* 7 (4), e22.
- Zhou, X., Snoswell, C.L., Harding, L.E., Bambling, M., Edirippulige, S., Bai, X., Smith, A.C., 2020. The role of telehealth in reducing the mental health burden from COVID-19. *Telemed. J. E. Health*(March). <https://doi.org/10.1089/tmj.2020.0068>. [Epub ahead of print].
- Zhu, Y., Chen, L., Ji, H., Xi, M., Fang, Y., Li, Y., 2020. The risk and prevention of novel coronavirus pneumonia infections among inpatients in psychiatric hospitals. *Neurosci. Bull.* 36 (3), 299–302.