

Coronavirus Pandemic

Anxiety impact during COVID-19: a systematic review

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Abstract

Introduction: The COVID-19 epidemic has been causing serious physical, but also psychological effects in society. This systematic review sought to identify studies that describe COVID-19 related anxiety, and to understand the impact of anxiety assessment in defining strategies to be implemented in future studies.

Methodology: This systematic review included cross-sectional studies with no publication year limit. It was performed a systematic search through three databases, namely, PubMed, Science Direct and Web of Science using the descriptors “COVID-19” and “anxiety”. PRISMA criteria reporting of systematic reviews and meta-analyses were applied. Eligible articles were selected in accordance with inclusion and exclusion criteria. The inclusion criteria were: research articles related with anxiety measurement during the COVID-19 outbreak; interventions to reduce anxiety; and published in English.

Results: From 44 references, just four scientific articles were accepted for inclusion within this review. These studies were analyzed regarding their sample, methodology, instruments used, and its results.

Conclusions: This systematic review was based on published data at the onset of the pandemic, and it could serve as a basis for the development of implementations plans to improve anxiety disorders. The importance of this theme, the implications and potential directions for future investigations will be discussed.

Key words: COVID-19; anxiety; psychological diseases; infections.

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Introduction

The outbreak of Coronavirus Disease 2019 (COVID-19) has been attracting an enormous amount of concern around the world. To stop the pandemic, research is needed to help infected patients, health professionals, and decision-makers – even though if conducted quickly and including the publication of preliminary data [1]. New policies, strategies, are being worked on every day in order to overcome the physical and psychological effects of this new outbreak.

The COVID-19 pandemic has been causing both physical and mental problems to people’s health. The psychological effects are of a wide variety, such as panic disorders, fears, anxiety, depression, and these can’t be neglected when dealing with the outbreak. There has been widespread panic and anxiety related to an unknown illness.

Infections by themselves can create a range of behavioural and psychological effects, such as anxiety, frustration, fear of causing infection, insomnia, and

irritability [2]. Thus, anxiety could be an expected effect, since almost everyone contact in some way with anxiety (health anxiety in this case). In one hand, it can be protective, helping to identify early signs of health issues and to adopt health-promoting behaviours; in the other hand, when excessive, can be harmful, triggering panic and risk behaviours [3]. So, it is important to know and assess anxiety, because it is crucial in influencing the success or failure of an action plan [4]. In this way, psychological factors could have a vital role in the success of public health strategies used to manage epidemics and pandemics.

It is necessary to inform the public, patients and health professionals about common stress responses like insomnia, panic attacks, health-anxiety, fear of illness or substance abuse [2]. It is also crucial to educate on general measures of countering stress like hygiene, activity schedule, exercising, social connections, avoiding social media forwards and relaxation techniques [2].

Early identification of distress and timely psychological interventions not only can prevent crisis at times of pandemics but also help in containing its spread [2,5].

The aim of this systematic review was to know the instruments and methodologies that have been used to measure anxiety within the context of COVID-19 outbreak, in order to be able to outline preventive strategies, to minimize the consequences and to obtain lower anxiety levels throughout the pandemics' evolution.

Methodology

This systematic review intended to analyze the relation between COVID-19 and anxiety. To this end, a systematic search was performed using Pubmed, Science Direct and Web of Science databases, over a period of time until March 26, 2020. Descriptors used were: "COVID-19" AND "anxiety". Then, articles' screening was conducted by applying eligibility criteria:

a) Inclusion: anxiety instruments applied during COVID-19 outbreak; interventions to reduce anxiety; research articles; English publications;

b) Exclusion: outside the scope of the subject; other types of publications (comments, editorials, discussions, correspondence, letters); publications in other languages than English; and studies whose full texts were not available.

Search results were exported into Endnote and duplicates removed.

This systematic review was conducted using PRISMA criteria for preferred reporting items within systematic reviews and meta-analyzes (PRISMA) [6,7]. The collected information was compiled and analyzed regarding the year of publication, authors, sample, country, methodology/type of study, instruments, results and research aim. The bibliographic references were made through the computer program EndNote bibliographic referencing.

Results

This systematic review identified 56 scientific articles published in international journals indexed to the digital databases used in this search. After screening, 12 duplicate publications were removed. So, 44 publications were available for evaluation by eligible criteria. Among these it was found 19 scientific articles (14 research articles and 5 review articles), but only 4 research articles met the inclusion criteria defined. The PRISMA flow diagram is presented in Figure 1.

A summary of these articles' properties is presented in Table 1.

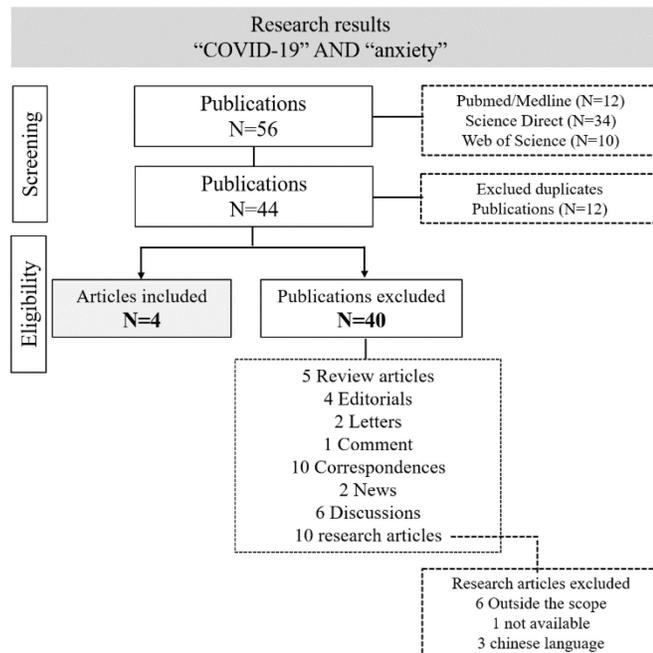
The four research articles were evaluated according with six characteristics: sample, country, methodology, instrument, results, and aim.

All the articles were published in China, during the initial months of 2020, and were cross-sectional studies. Although similar in their methodological approach, different psychometric instruments were used in them. The instruments used to evaluate anxiety were: Spielberger State-Trait Anxiety Scale (STAI); Sleep State Self-Rating Scale (SRSS); 7-item Generalized Anxiety Disorder Scale (GAD-7); Self-Rating Anxiety Scale (SAS); General Self-Efficacy Scale (GSES); Stanford Acute Stress Reaction (SASR) questionnaire; Pittsburgh Sleep Quality Index (PSQI); Social Support Rate Scale (SSRS); Impact of Event Scale-Revised (IES-R); Depression, Anxiety and Stress Scale (DASS-21).

The sampling was also different among these studies. Its size ranged from 50 to 7143 participants and was composed by students, healthcare professionals, COVID-19 patients and public participants. After an analysis of each sample, the data showed that every participant presented anxiety perceptions linked with the COVID-19 outbreak.

Patients with COVID-19 experienced high levels of anxiety and low sleep quality due to isolation treatment. On this matter, Liu and collaborators (2020) reported

Figure 1. Prisma flow diagram.



that COVID-19 patients when submitted to an intervention plan (progressive muscle relaxation method), the average anxiety scores improved with statistical significance when compared with previous values [8]. The same happens when sleep scores were analyzed before and after the intervention.

In turn, when health professionals were assessed, the data showed that anxiety scores were significantly associated with stress, which negatively impacted self-efficacy and sleep quality [9]. Anxiety, stress, and self-efficacy were mediating variables associated with social support and sleep quality. So, these psychological effects, such as anxiety, affect not only patients and medical staff but also everyone.

The general public was also evaluated by Wang and his research team to better understand the psychological impact, anxiety, depression, and stress during the initial stage of the COVID-19 outbreak among the population [10]. The results showed the psychological impact as classified by levels (moderate to severe depressive symptoms, moderate to severe anxiety symptoms and moderate to severe stress levels). The majority of participants, stayed at home, did not report any physical symptoms, presented good self-rated health status, but were worried about their family and on accurate information. Yet, the participants were satisfied with the amount of health information available. In this study, female gender, student status, specific physical symptoms, and poor self-rated health status were

Table 1. Summary information for accepted studies of “Anxiety related with COVID-19”.

Author / Year	Sample	Country	Methods	Instruments	Results	Aim
Cao <i>et al.</i> , 2020 [11]	7143 college students (Female 4975; Male 2168)	China	Cross sectional	- 7-item Generalized Anxiety Disorder Scale (GAD-7).	Students have experienced anxiety because of this COVID-19 outbreak (24.9%). Living alone had increased anxiety Worry about the economic influences of the epidemic, academic delays, influence of the epidemic on daily-life were positively related to the levels of anxiety. Negative association between social support and anxiety symptoms.	To evaluate the mental situation of college students during the epidemic; To provide a theoretical basis for psychological interventions with college students; To provide a basis for the promulgation of national and governmental policies.
Liu <i>et al.</i> , 2020 [8]	51 COVID-19 patients	China	Cross sectional	- Spielberger State-Trait Anxiety Scale (STAI); - Sleep State Self-Rating Scale (SRSS).	The average anxiety score, as well as, sleep quality score after intervention (progressive muscle relaxation method) was statistically significant.	To investigate the effect of progressive muscle relaxation on anxiety and sleep quality of COVID-19.
Xiao <i>et al.</i> , 2020 [9]	180 medical staff	China	Cross-sectional	- Self-Rating Anxiety Scale (SAS); - General Self-Efficacy Scale (GSES); - Stanford Acute Stress Reaction (SASR) questionnaire; - Pittsburgh Sleep Quality Index (PSQI); - Social Support Rate Scale (SSRS).	Social support for medical staff were significantly associated with self-efficacy and sleep quality and negatively associated with the degree of anxiety and stress. Levels of anxiety were significantly associated with the levels of stress, which negatively impacted self-efficacy and sleep quality. Anxiety, stress, and self-efficacy were mediating variables associated with social support and sleep quality.	To use Structural Equation Modeling to determine the effects of social support on sleep quality and function of medical staff who treated COVID-19 patients.
Wang <i>et al.</i> , 2020 [10]	1210 public participants (students and community)	China	Cross-sectional	- Impact of Event Scale-Revised (IES-R) Depression; - Anxiety and Stress Scale (DASS-21).	Psychological impact of the outbreak as moderate or severe (53.8%); moderate to severe depressive symptoms (16.5%); moderate to severe anxiety symptoms (28.8%); moderate to severe stress levels (8.1%). Participants stayed at home (84.7%); worried about their family contracting COVID-19 (75.2%); satisfied with the amount of health information available (75.1%). □ Female, student, physical symptoms, and poor self-rated health status were associated with a greater psychological impact and higher levels of stress, anxiety, and depression. Health information and preventive measures were associated with a lower psychological impact/stress, anxiety, and depression levels.	To survey the general public in China to better understand their levels of psychological impact, anxiety, depression, and stress during the initial stage of the COVID-19 outbreak.

significantly associated with a greater psychological impact related to the outbreak and higher levels of stress, anxiety, and depression. On the other hand, specific, current health information and preventive measures were associated with a lower psychological impact, as well as lower stress, anxiety and depression levels.

Students were another specific group under scope Cao and collaborators (2020) evaluated the mental situation of college students during the pandemic in order to provide a theoretical basis for psychological interventions with them [11]. The data showed that some students experienced anxiety related with COVID-19 pandemic and that there were no gender differences in regard to anxiety scores. These results do not corroborate the previous study. The same study reported that living alone, worrying about economic influences and academic delays had an impact on anxiety.

Discussion

This systematic review was designed to provide insights into anxiety during COVID-19 outbreak, as also into new approaches, methodologies, and measurement instruments. The pertinence of this theme requires a careful study since the impact of COVID-19 on mental health is not yet conclusive. Nevertheless, the literature on the psychological reactions to previous epidemics and pandemics could help us to understand what to expect [12]. Previous research suggested that several psychological vulnerability factors may play a role in “*coronaphobia*”, including anxiety, worries, fears, intolerance of uncertainty, and perceived susceptibility to a disease [4]. Yet, more research is needed to understand the effects of COVID-19 on psychological health. Research from other infectious outbreaks suggested the importance of information management as a factor with a significant role [4,12].

These studies corroborated each other, even though they were few, due to the novelty of this topic. They focused on the Chinese context, the country where the pandemic emerged [13]. So, through this systematic review, it was possible to say that anxiety affected a wide range of people, although the level of anxiety was different among individuals.

Anxiety and fear often existed in suspected or confirmed patients [14,15]. The quarantine, the medical isolation, the lack of accessible information, ignorance of the disease, were stressors that triggered psychological effects. Therefore, the literature reported that psychological counseling should be adopted to help

and reduce the psychological damage caused by the pandemic [8,14,15].

Another target of these psychological symptoms were the healthcare professionals. In China to respond rapidly to the psychological pressures on health staff, a detailed psychological intervention plan was developed. This plan was constituted in three areas: "building a psychological intervention medical team, which provided online courses to guide medical staff to deal with common psychological problems; a psychological assistance hotline team, which provided guidance and supervision to solve psychological problems; and psychological interventions, which provided various group activities to release stress" [16]. However, the implementation of psychological intervention services found obstacles within health professionals' adhesion, and, therefore, the measures of psychological intervention were adjusted accordingly to the needs of these professionals [16].

Health professionals deserve a special attention, and both social and organizational support have shown to be protective mental health variables for healthcare staff in general [17]. In addition to the Xiao and collaborators [9] study reported in this systematic review, other preliminary studies were being carried out and published, for example, Liang and his team [18] published a preliminary study that screened mental health medical staff, whose results suggested the need in enabling health authorities to allocate health resources and develop appropriate treatments for health professionals.

Last but not least, it remains to address the findings on the general population. Stress factors, such as quarantine, confusion, fear, anger, insomnia and anxiety were reported in the literature as psychological responses to COVID-19 impact [17]. The financial loss as a result of quarantine was also reported as a distress and risk factor for symptoms of psychological disorders and for both anger and anxiety several months after quarantine.

So, public health education must be based on scientific evidence to reduce the anxiety, distress, and psychological effects, caused by misinformation. Misinformation has spread panic among the general population and was not conducive to the implementation of pandemic control measures [19]. In China, several books on COVID-19 prevention, control, and mental health education have been swiftly published and free electronic copies have been provided for the public. For example, the “Guidelines for public psychological self-help and counseling of 2019-nCoV

pneumonia”, published by the Chinese Association for Mental Health [20].

On the other hand, in China the online psychological counseling services have been widely established by mental health professionals in medical institutions, universities, and academic societies; in order to implement self-help intervention systems, including online cognitive behavioral therapy for depression, anxiety, and insomnia. Likewise, several artificial intelligence programs have been put in use as interventions for psychological crises elicited during the epidemic [20].

Methodological limitations

In this study, the selected methodology for the inclusion and exclusion criteria could limit the obtained results. It could leave out many valid studies and relevant factors to the understanding of this subject. The lack of publications in this area also conditioned this selection, analysis and generalization of the results; what is understandable.

The studies analyzed tackled several anxiety measurements and not showed a consistency with a single instrument. Other limitations were: sample size representativeness; cross-sectional design of the study [8-11]; individual differences and psychological conditions among samples; the influence of environmental and cultural factors on the individual and the patient’s received attention during the hospital stay [8]; snowball sampling strategy [10]; and self-reported levels of psychological impact, anxiety, depression and stress, which may not always be aligned with the assessment made by mental health professionals [10].

Notwithstanding the above limitations, this study provided invaluable information on the initial psychological responses after the outbreak of COVID-19 at China.

Implications for practice

The current systematic review suggested the need for new studies on methodologies, intervention plans, and longitudinal studies, which could analyze the implications of COVID-19 over time. These studies should be extended to populations in other countries.

The present review would be an enhancer to explore effective and accessible strategies to help the public health and some specific subgroups, to decrease anxiety symptoms and improve psychological well-being. Additionally, it could serve as a basis for the development of cost-effective interventions, easy to be implemented and potentially valuable in public health

educative programs, improving health quality within health organizations.

Conclusions

Psychological factors are intrinsically linked to epidemics and pandemics; also health anxiety is important in the management of the success or failure of strategies adopted [4].

This systematic review intended to increase the knowledge about this theme; on the COVID-19 impact upon anxiety, possible strategies, anxiety reduction studies and intervention programs. Despite the few publications on the subject, it was possible to conclude on the importance of this theme for different groups, experiences, lessons for life and new approaches to this problem. It is recommended that future research include a wide participation among different groups, countries and training programs.

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