

# Psychological sequelae within different populations during the COVID-19 pandemic: a rapid review of extant evidence

Xin Jie Jordon Tng<sup>1,\*</sup>, BSocSci(Hons), Qian Hui Chew<sup>1,\*</sup>, BSocSci(Hons), Kang Sim<sup>2</sup>, MBBS, MMed

**ABSTRACT** The rapid spread of COVID-19 has a potentially significant impact on not only physical health but also psychological well-being. To the best of our knowledge, no review thus far has consolidated the psychological impact of COVID-19 across different subpopulations. A systematic search of the literature until 15 June 2020 found 150 empirical papers pertinent to the mental health consequences of the pandemic. The majority (87.3%) were from China (45.3%), the rest of Asia (22.0%) and Europe (20.0%), and mostly examined the general population (37.3%), healthcare workers (31.3%) and those with pre-existing mental and physical illnesses (14.7%). The most common psychological responses across these subpopulations were anxiety (overall range 24.8%–49.5%), depression (overall range 18.6%–42.6%) and traumatic stress symptoms (overall range 12.7%–31.6%). Healthcare workers and those with pre-existing physical and mental illnesses were more severely affected. Future studies are needed on underexamined subgroups such as the elderly and patients who recovered from COVID-19.

*Keywords:* healthcare workers, infectious diseases, psychological responses, vulnerable populations

## INTRODUCTION

The severity and rapid spread of COVID-19 has had a significant impact on not only the physical health of communities worldwide but also their psychological well-being. This issue is of particular concern as the battle against this pandemic becomes increasingly long-drawn and strict infection control measures have been implemented. These measures will be eased at different rates around the world but may be reinstated with new waves of infection. As of 15 June 2020, COVID-19 had infected more than eight million people across 213 countries and territories; more than 435,000 people had died from the disease and over 4.1 million had recovered.<sup>(1)</sup>

Previous studies on the psychological impact of infectious diseases have commonly reported responses in the general population such as anxiety/fear, depression, anger, guilt, grief and loss, post-traumatic stress and stigmatisation. However, there is also a greater sense of empowerment and compassion towards others.<sup>(2)</sup> Healthcare workers at the forefront of the fight against infectious diseases experience various stressors such as the fear of getting infected, losing control of the spread of the virus, and passing the virus on to their family and friends.<sup>(3)</sup> Based on these past experiences, the potential mental health repercussions of infectious disease outbreaks are increasingly being recognised and acknowledged during the current COVID-19 pandemic.

To date, although there have been various international studies on the psychosocial responses related to COVID-19, no review thus far has consolidated the extant psychological impact on the different subpopulations, such as the general population, healthcare workers and vulnerable populations, including patients with pre-existing physical or psychiatric

illnesses. Hence, we aimed to examine and summarise existing studies to date regarding the psychological impact of COVID-19 on various populations through a rapid review. Understanding the psychological ramifications of this pandemic could inform healthcare systems to target policy decisions for specific populations, and to anticipate and prepare for a protracted battle against COVID-19, in the face of globally dyssynchronous and varied infection control measures.

## METHODS

We performed a systematic search of the available literature using PubMed and MEDLINE (Ovid). The following search strategy was used (('Betacoronavirus'[Mesh] OR 'Coronavirus Infections'[MH] OR 'Spike Glycoprotein, COVID-19 Virus'[NM] OR 'COVID-19'[NM] OR 'Coronavirus'[MH] OR 'Severe Acute Respiratory Syndrome Coronavirus 2'[NM] OR 2019nCoV[ALL] OR Betacoronavirus\*[ALL] OR Corona Virus\*[ALL] OR Coronavirus\*[ALL] OR Coronavirus\*[ALL] OR CoV[ALL] OR CoV2[ALL] OR COVID[ALL] OR COVID19[ALL] OR COVID-19[ALL] OR HCoV-19[ALL] OR nCoV[ALL] OR 'SARS CoV 2'[ALL] OR SARS2[ALL] OR SARSCoV[ALL] OR SARS-CoV[ALL] OR SARS-CoV-2[ALL] OR Severe Acute Respiratory Syndrome CoV\*[ALL]) AND (mental health OR psychiatric OR psychological)) based on recommendations.<sup>(4)</sup> Papers that were published from database inception to 15 June 2020 were considered for inclusion. Only empirical studies in the English language and papers from peer-reviewed journals that reported the psychological impact of COVID-19 on one or more populations were included. Case studies, reviews, qualitative studies and dissertations were excluded. Studies that did not

<sup>1</sup>Research Department, <sup>2</sup>West Region, Institute of Mental Health, Singapore

\*These two authors contributed equally as first authors in this work.

**Correspondence:** A/Prof Kang Sim, Senior Consultant, West Region, Institute of Mental Health, 10 Buangkok View, Singapore 539747. kang\_sim@imh.com.sg

report the rates or prevalence of psychological responses were also excluded. A PRISMA flow diagram depicting how articles were selected is presented in Fig. 1.

## RESULTS

The majority of the 150 included papers originated from Asia (67.3%,  $n = 101$ ), Europe (20.0%,  $n = 30$ ) and North America (9.3%,  $n = 14$ ). Anxiety, depression and traumatic distress were the three commonest reported psychological responses across all papers, with prevalence rates ranging from 2.7%<sup>(5)</sup> to 72.8%<sup>(6)</sup>, 0.9%<sup>(7)</sup> to 83.6%<sup>(6)</sup> and 1.9%<sup>(8)</sup> to 96.2%<sup>(9)</sup> respectively. Detailed prevalence rates are reported in the Appendix.<sup>(5-154)</sup> Out of the 150 studies, 56 (37.3%) explored psychological responses in the general population, while 47 (31.3%) reported them within healthcare workers. Only 22 (14.7%) studies examined psychological responses in patients with pre-existing mental and physical conditions. In the general population, the prevalence of anxiety ranged from 2.7%<sup>(5)</sup> to 62.5%<sup>(10)</sup> while that of depression ranged from 0.9%<sup>(5)</sup> to 40.3%<sup>(11)</sup> and that of post-traumatic stress symptoms ranged from 1.9%<sup>(12)</sup> to 33.0%<sup>(13)</sup>. Among healthcare workers, the prevalence of anxiety ranged from 5.7%<sup>(14)</sup> to 61.0%<sup>(15)</sup> that of depression ranged from 8.9%<sup>(16)</sup> to 64.7%<sup>(17)</sup> and that of post-traumatic stress symptoms ranged from 3.8%<sup>(18)</sup> to 49.4%<sup>(19)</sup>. Among patients with pre-existing mental illnesses, the prevalence of anxiety was 23.6%<sup>(5)</sup> to 50.0%<sup>(20)</sup> and that of depression was 10.8%<sup>(8)</sup> to 64.3%<sup>(20)</sup> while only one paper reported the prevalence of post-traumatic stress symptoms to be 31.6%<sup>(5)</sup>. Among patients with pre-existing physical conditions, the prevalence of anxiety ranged from 42.0%<sup>(21)</sup> to 72.8%<sup>(6)</sup> while that of depression ranged from 9.7%<sup>(22)</sup> to 83.6%<sup>(6)</sup>. There were relatively fewer reports on younger persons (children and youths), quarantined subgroups and COVID-19 patients. Available data suggests that the younger subgroup reported substantial rates of anxiety ranging from 24.9%<sup>(23)</sup> to 45.5%<sup>(24)</sup> depression ranging from 9%<sup>(25)</sup> to 48.1%<sup>(26)</sup> and traumatic stress ranging from 2.7%<sup>(25)</sup> to 31.8%<sup>(27)</sup>. Those who were quarantined reported anxiety ranging from 10.2%<sup>(28)</sup> to 50.3%<sup>(29)</sup> depression ranging from 9.0%<sup>(25)</sup> to 22.4%<sup>(30)</sup> and traumatic stress ranging from 2.7%<sup>(25)</sup>. Patients suffering from COVID-19 infection reported anxiety ranging from 2.4%<sup>(31)</sup> to 55.3%<sup>(12)</sup> depression ranging from 12.2%<sup>(31)</sup> to 60.2%<sup>(12)</sup> and traumatic stress ranging from 1%<sup>(12)</sup> to 96.2%<sup>(9)</sup>. Table I summaries the overall prevalence rates of COVID-19-related psychological responses among the different populations.

Measures proposed to address the mental health repercussions of the pandemic could be grouped into individual and collective measures. A total of 16 papers proposed measures that an individual could take, including ensuring adequate rest and exercise,<sup>(32-34)</sup> increasing one's self-awareness of emerging psychological stressors and mental health issues,<sup>(32,35)</sup> and boosting one's sense of control.<sup>(35)</sup> Collective measures proposed by 129 papers include regular crisis communications in order to ensure that accurate information is disseminated in a timely manner.<sup>(36-39)</sup> False information should also be filtered out and corrected as soon as possible.<sup>(39,40)</sup> There is a need to continually assess and

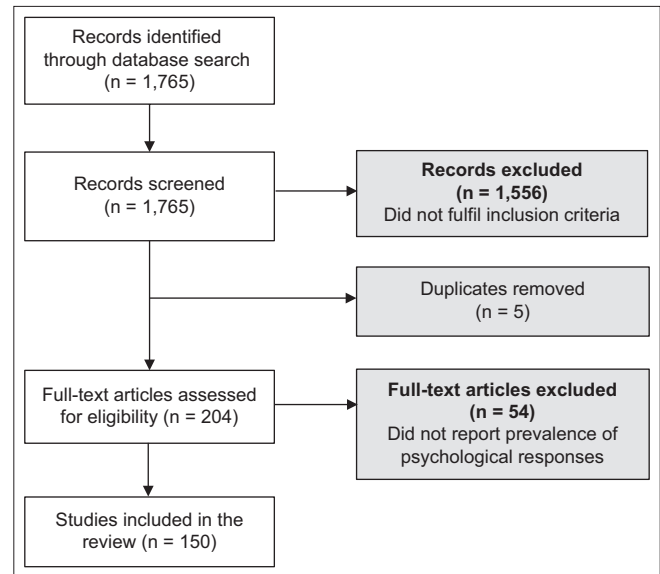


Fig. 1 PRISMA chart shows the article selection process.

monitor the psychological well-being of various populations (e.g. general population, healthcare workers and those with pre-existing physical or psychiatric conditions) in order to identify those at risk and offer early intervention.<sup>(15,41,42)</sup> It has been recommended that adequate resources be allocated to mental health interventions, which should be made available and acceptable to various subpopulations through channels, including digital means.<sup>(43)</sup> Disruption to essential medical services should be kept to a minimum such that those with pre-existing medical conditions can be supported throughout this pandemic.<sup>(44)</sup> In addition, financial and social support may be helpful for reducing the repercussions for mental health that can arise from job losses or prolonged quarantine.<sup>(30,45-48)</sup>

## DISCUSSION

Our rapid review sought to capture an overview of psychological responses to date in various populations during the COVID-19 pandemic. We found that most studies focused on the general adult population, healthcare workers and the vulnerable (defined as those with pre-existing physical and psychiatric illnesses), and anxiety, depression and traumatic stress were the more commonly reported responses across studies.

By geographical region, the majority of the studies conducted were from Asia (101 papers, 67.3%), especially China (68 papers, 45.3%), followed by Europe (30 papers, 20.0%). This is likely because China was the first country to discover and experience the rapid spread of COVID-19, followed by countries in Europe. Other countries may learn from the experiences of Asia (such as China) and Europe to better plan to serve mental healthcare needs in response to changes in the respective epidemic curves over time.

In terms of prevalence rate, healthcare workers tended to report higher rates of anxiety (overall 33.0%, 4,866/14,728) but lower rates of traumatic stress (overall 14.6%, 3,256/22,320) compared with the general population (overall 24.8%, 16,825/67,773 for anxiety and 20.8%, 2,163/10,380 for traumatic stress). The higher anxiety in healthcare workers could be related

**Table I. Overall prevalence rates of COVID-19-related psychological responses among different populations.**

Population	Anxiety	Depression	Traumatic stress symptoms
General population	2.7%–62.5% Overall 24.8% (16,825/67,773)	0.9%–40.3% Overall 23.1% (13,412/58,114)	1.9%–33.0% Overall 20.8% (2,163/10,380)
Healthcare workers	5.7%–61% Overall 33.0% (4,866/14,728)	8.9%–64.7% Overall 25.7% (7,950/30,885)	3.8%–49.4% Overall 14.6% (3,256/22,320)
Patients with pre-existing mental conditions	23.6%–50.0% Overall 26.0% (583/2,242)	10.8%–64.3% Overall 18.6% (411/2,213)	31.6% Overall 31.6% (24/76)
Patients with pre-existing physical conditions	42%–72.8% Overall 49.5% (791/1,597)	9.7%–83.6% Overall 42.6% (609/1,428)	12.7% Overall broad criteria 12.7% (32/252)

to the high infectivity of COVID-19 with the resultant sharp rise in infected cases and mortality seen and managed by frontline healthcare workers, especially at the start of the pandemic when little was known about its natural history.<sup>(155)</sup> The relatively lower rate of traumatic stress in healthcare workers could be related to the better preparedness in terms of protective equipment and strict infection control measures within healthcare facilities in managing the outbreak.<sup>(49)</sup> Compared with past epidemics such as the severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) outbreaks, the rates of anxiety (up to 96% in MERS vs. overall 33% in COVID-19)<sup>(15,156)</sup> and traumatic stress (25.5% in SARS vs. overall 14.6% in COVID-19)<sup>(19,157)</sup> in healthcare workers were lower during the current pandemic. This likely reflects progressive improvements in infection control measures and infrastructure that have translated to better psychological well-being since earlier outbreaks such as SARS, especially in Asia, which bore the brunt of the infection and fatality.<sup>(158)</sup> Of note, there were relatively substantial psychological responses within subgroups, such as among those with pre-existing physical and psychiatric illnesses (overall anxiety 26%–49.5%, overall depression 18.6%–42.6% and overall traumatic stress symptoms of 12.7%–31.6%).<sup>(5,6,8,20,22,44,50-65)</sup> Although less studied, psychological sequelae were noted in younger individuals such as children and youths (overall anxiety 31.0%, overall depression 34.2% and traumatic stress symptoms 11%),<sup>(23-27,39,41,66-69)</sup> individuals who were quarantined (overall anxiety 28.2%, overall depression 14.7%, overall traumatic stress symptoms 2.7%)<sup>(24,25,28-30,67,70,71)</sup> and patients who were infected with COVID-19 (overall anxiety 32.2%, overall depression 39.9%, overall traumatic stress symptoms 80.7%).<sup>(9,12,28,31,72,73)</sup> This highlights the need for active monitoring, early detection and attention to these psychological issues within the different subpopulations.

Practical implications include individual and institutional measures to address and ameliorate the psychological impact. At the institutional and governance level, useful considerations are: commitment for the long haul; timely communication about the local epidemic curve; enabling access to timely, accurate COVID-19-related information and resources for psychological help among the population and subgroups; constant review of implemented measures; and early identification of those in need of psychological help.<sup>(2)</sup> At the individual level, an emphasis on self-care and a healthy balance between work and rest, nutrition, sleep, and social connectivity<sup>(2)</sup> are crucial.

Several limitations were observed in this study. First, timely publication of appropriate reports from other affected countries worldwide would provide a better representation of the nature and scale of the psychological impact. Second, examination of the psychological sequelae in specific subgroups such as the elderly, those who have recovered from COVID-19, and patients with multiple physical and psychiatric comorbidities is warranted. Third, some specific psychosocial responses are less examined but have been observed in past infectious disease outbreaks, including stigmatisation, grief and positive growth. Fourth, a better understanding of how digitalisation has helped or hindered psychological well-being would inform measures to enhance psychological support. Fifth, there is a need to consider longitudinal studies to ascertain the longer-term psychological sequelae within the different subgroups.

In conclusion, extant studies at this juncture suggest that there are substantial COVID-19 psychological sequelae among healthcare workers and the general population, including vulnerable subgroups. Further work is needed to better understand the psychological impact on under-examined subgroups, especially prospectively, in order to optimise psychological support for them globally.

## SUPPLEMENTARY MATERIAL

The Appendix is available online at <https://doi.org/10.11622/smedj.2020111>.

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