






# Psychological State and Associated Factors During the 2019 Coronavirus Disease (COVID-19) Pandemic Among Filipinos with Rheumatoid Arthritis or Systemic Lupus Erythematosus

This article was published in the following Dove Press journal:  
*Open Access Rheumatology: Research and Reviews*

Cherica A Tee <sup>1</sup>  
Evelyn O Salido <sup>2</sup>  
Patrick Wincy C Reyes <sup>3</sup>  
Roger C Ho <sup>4</sup>  
Michael L Tee <sup>5</sup>

<sup>1</sup>Department of Pediatrics, College of Medicine, University of the Philippines, Manila, Philippines; <sup>2</sup>Department of Medicine, College of Medicine, University of the Philippines, Manila, Philippines; <sup>3</sup>School of Statistics, University of the Philippines Diliman, Quezon City, Philippines; <sup>4</sup>Department of Psychological Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Kent Ridge, Singapore; <sup>5</sup>Department of Physiology, College of Medicine, University of the Philippines, Manila, Philippines

**Background:** Patients with systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA) are perceived to be more vulnerable to worse COVID-19 infection outcome. Furthermore, severe shortage in hydroxychloroquine supply was experienced.

**Objective:** We presented the psychological responses of Filipino SLE and RA patients to the COVID-19 pandemic and shortage of hydroxychloroquine supply.

**Methods:** A total of 512 completed online surveys from SLE and RA patients were gathered from May 19 to 26, 2020. The online survey collected data on socio-demographics, health status, contact history, health service utilization, use of hydroxychloroquine, COVID-19 knowledge and concerns, precautionary measures, information needs, the validated Impact of Events Scale-Revised (IES-R) and Depression, Anxiety and Stress Scales (DASS-21) ratings.

**Results:** The psychological impact of COVID-19 outbreak was at least moderate in 20%. The mean IES-R score was higher among SLE (22.34, SD=14.39) than RA (18.85, SD=13.24) patients. Stress, anxiety and depression were moderate to severe in 12.3%, 38.7%, and 27.7% of respondents. The mean stress subscale score was 10.11 (SD=7.95), mean anxiety subscale score was 6.79 (SD=6.57) and mean depression subscale score was 9.03 (SD=8.77). The risk factors for adverse mental health during the COVID-19 pandemic include the presence of comorbidity of hypertension and asthma; being a healthcare worker; and presence of specific symptoms of myalgia, cough, breathing difficulty, dizziness and sore throat. The protective factors for mental health during the pandemic include satisfaction with available health information and wearing of face masks.

**Conclusion:** In the third month of the pandemic in the Philippines, 20% of the respondents with lupus and RA experienced moderate to severe psychological impact. There was moderate to severe anxiety in 38.7% and moderate to severe depression in 27%. Identification of factors that affect mental health in lupus and RA is useful in implementation of effective psychological support strategies.

**Keywords:** mental health, RA, SLE, Philippines

## Introduction

The 2019 coronavirus disease (COVID-19) pandemic poses a threat to both physical and mental health. The disease is highly contagious and can be fatal. It has affected more than 19 million worldwide, resulting in the death of more than 728,000 individuals.<sup>1</sup> In the Philippines, more than 136,000 confirmed cases have

Correspondence: Cherica A Tee  
Department of Pediatrics, College of  
Medicine, University of the Philippines,  
Manila 1000, Philippines  
Email [catee@up.edu.ph](mailto:catee@up.edu.ph)

been documented with 2200 deaths over a five-month period.<sup>2</sup> Treatment approaches are evolving based on new evidence of the efficacy and safety of various drug and non-drug strategies. Containment measures in place since the middle of March 2020, including community quarantine and physical distancing, were aimed to slow down the spread of the infection. However, the needed shift in focus of health care resources for COVID-19 patients and the implementation of community quarantine have significantly limited the access of persons with chronic diseases to medical care and medicines. People with autoimmune systemic connective tissue diseases including rheumatoid arthritis and lupus erythematosus are perceived to be vulnerable and at an increased risk of contracting severe COVID-19 illness because of their immunocompromised status, chronic state of inflammation, predisposition to flare when exposed to any forms of stress, and use of immunosuppressive medicines.<sup>3</sup> The off-label use of hydroxychloroquine for COVID-19 and the halt of importation of medicines have adversely affected the availability of the drug for their use. Currently, there is no information about the psychological impact of the COVID-19 epidemic on the mental health of these patients. This would be especially pertinent as there is uncertainty surrounding this outbreak of such unparalleled magnitude.

COVID-19 is a highly infectious and potentially lethal disease. The global case fatality rate (CFR) is estimated at 3.7% based on Our World in Data as of August 11, 2020.<sup>4</sup> This varies among countries and will likely trend downwards as more data become available. The CFR increases with age and in the presence of comorbidities (hypertension, diabetes mellitus, cardiovascular or cerebrovascular disease, respiratory disease and obesity).<sup>5</sup> Autoimmune diseases, like rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE), that are characterized by an immunosuppressed state confer a high risk of acquiring and dying of this infection.

The race to find a cure for 2019 coronavirus disease (COVID-19) focused global attention on the potential of hydroxychloroquine in preventing catastrophic cytokine storm and its efficacy as post-exposure prophylaxis in preventing COVID-19-related symptoms.<sup>6</sup> Hydroxychloroquine is recommended in all patients with lupus, at a dose not exceeding 5 mg/kg real body weight as part of standard of care.<sup>7</sup> The 1995 HERA study<sup>8</sup> showed it has a significant benefit on synovitis, pain, and physical disability of recent-onset rheumatoid arthritis. Despite its

relatively delayed onset of action, its touted benefits in reducing cardiovascular morbidity in patients with RA have been recognized, making it a good second-line DMARD therapy for patients with inadequate response to methotrexate.<sup>9</sup> The demand surge for hydroxychloroquine severely affected access to this drug among patients with SLE and RA.<sup>10</sup>

Then on 22 May 2020, while this survey was being conducted, a study by Mehra et al<sup>11</sup> concluded that use of drug regimens of chloroquine or hydroxychloroquine alone or in combination with a macrolide was associated with an increased hazard for clinically significant occurrence of ventricular arrhythmias and increased risk of in-hospital death with COVID-19. This study has since been retracted.

During the COVID-19 pandemic, there were reports of insomnia, psychological distress, anxiety, depression and symptoms of post-traumatic stress disorder among the general populations in Asia and Europe.<sup>12-15</sup> Salari et al reported in their systemic review and meta-analysis that the prevalence of stress, anxiety and depression were 29.6%, 31.9% and 33.7%, respectively.<sup>12</sup> To date, there are no studies on the psychological impact of the COVID-19 pandemic on individuals with rheumatoid arthritis or lupus erythematosus who belong to the perceived vulnerable groups within society. This study aimed to determine the prevalence of psychiatric symptoms and identify risk and protective factors associated with psychological distress among these individuals during the imposed quarantine period in the Philippines.

## Methodology

### Participants

A cross-sectional survey was conducted among rheumatologic patients with RA and SLE from May 19 to 26, 2020, two months since the Philippine government has implemented enhanced community quarantine minimizing face-to-face interactions and forcing people to stay in their homes.<sup>16</sup> Snowball sampling technique was implemented by sending a link of the SurveyMonkey questionnaire through email addresses, and social media accounts of various rheumatology patient groups. Respondents were encouraged to share the link to as many people as possible. Non-disclosure of the diagnosis of either SLE or RA precluded the survey response from the analysis.

### Measures and Outcomes

The survey included socio-demographic data, physical symptoms related to COVID-19, health service utilization

in the past 14 days prior to the survey, contact history, knowledge and concerns about COVID-19, precautionary measures against COVID-19, and information update on COVID-19. There was additional information on the connective tissue disease diagnosis, length of illness, comorbidity, use and supply of hydroxychloroquine and methotrexate as treatment, and presence or absence of symptoms related to rheumatic disease for the past 14 days prior to the survey.

The mental health status was measured using the validated Depression, Anxiety and Stress Scale (DASS-21) previously used in American,<sup>17</sup> European,<sup>18</sup> and Asian<sup>19–21</sup> populations. The calculation of scores was based on previous studies.<sup>14,15,22</sup> The total depression subscale was divided into normal (0–9), mild depression (10–12), moderate depression (13–20), severe depression (21–27) and extremely severe depression symptoms (28–42). The total anxiety subscale score was divided into normal (0–6), mild anxiety (7–9), moderate anxiety (10–14), severe anxiety (15–19) and extremely severe anxiety symptoms (20–42). The total stress subscale score was divided into normal (0–10), mild stress (11–18), moderate stress (19–26), severe stress (27–34) and extremely severe stress (35–42).

The psychological impact of the COVID-19 pandemic was measured using the Impact of Event Scale-Revised (IES-R).<sup>23,24</sup> The IES-R has been well validated among different populations measuring subjective response to a stressful life event such as illness, accidents, crises and disease outbreaks.<sup>25–28</sup> The 22-item IES-R questionnaire was composed of three subscales that measured mean avoidance, intrusion and hyperarousal. The total IES-R score was multiplied by two and interpreted as normal (0–23), mild psychological impact (24–32), moderate psychological impact (33–36) and severe psychological impact (>37). Both the DASS-21 and IES-R tools have been previously used for their psychometric properties in research related to the COVID-19 outbreak.<sup>14,29–31</sup>

## Statistical Analysis

Data analysis was performed using the SPSS Statistic 24.0 (IBM SPSS, New York, NY, USA). Frequency and percentage were applied to describe variables. The scores of IES-R and DASS-21 subscales were expressed as mean and standard deviation (SD). The scales were regrouped into dichotomous variables of (1) normal and mild, and (2) at least moderate. Univariate and multivariate analyses were performed. Chi-square tests of independence were employed to check univariate associations. For the latter,

binary logistic regressions were modeled with all the independent variables of interest in the full model. *P* value <0.05 was considered statistically significant.

## Ethics

The study was conducted in accordance with the Declaration of Helsinki as approved by the University of the Philippines Manila Research Ethics Board (UPMREB 2020–198-01). Completion of the survey was deemed informed consent. No parental consent was required from respondents under the age of 18 years. The collected data were anonymous and treated as confidential.

## Results

### Population Characteristics

There were 512 participants in the survey; 405 (79.1%) with lupus erythematosus and 107 (20.9%) with rheumatoid arthritis. Table 1 shows there was female preponderance and most participants were aged between 22 and 50 years. The majority of participants were well educated (at least college education), married, with children, and members of a household size of 3–5 people. Around 48.2% were employed with 8.8% (45/512) as health care professionals. Most had medical insurance coverage (85%).

### Exposure and Knowledge About Novel Coronavirus

There were a few (9/512, 1.7%) respondents who had traveled outside the country and a larger proportion (96/512, 18.8%) who had traveled outside their residential city or province during the first two weeks of March of this year, prior to the lockdown period. There were four respondents who had direct or indirect contact with persons suffering from COVID-19. More than 90% of the respondents were aware of the spread of SARS-CoV2 through droplets and contact with contaminated objects while 42.7% believed that transmission can be airborne.

Eighty-one percent (81%) of the respondents were satisfied with and wished to receive more information about COVID-19. Almost all were aware of the statistics on the number of Filipinos infected, recovered, and died due to COVID-19. This information was obtained through social media (60%) and traditional media (35%).

Many (49.2%) reported that they will likely contract COVID-19 during the outbreak and 63.4% believed that they will likely survive if they do get infected. Most of them (87%) were confident in their doctor's ability to

**Table 1** Demographic Characteristics of Patient Respondents (n=512)

Variable	n (%)
Gender	
Male	23 (4.5)
Female	489 (95.5)
Age Group	
12–21	26 (5.1)
22–30	132 (25.8)
31–40	156 (30.5)
41–49	113 (22.1)
50 +	85 (16.6)
Educational Attainment	
Below undergraduate	197 (38.5)
University: Bachelor	272 (53.1)
University: Master or PhD	43 (8.4)
Marital Status	
Single	237 (46.3)
Married	246 (48)
Divorced/separated	17 (3.3)
Widowed	12 (2.3)
Household Size	
1–2 persons	70 (13.7)
3–5 persons	308 (60.2)
6 persons or more	134 (26.2)
Employment Status	
Employed	247 (48.2)
Unemployed	265 (51.8)
Parental Status	
Not applicable	145 (28.3)
No children	90 (17.6)
Has child < 16 y. o.	133 (26)
Has child > 16 y. o.	84 (16.4)
Has children > 16 y.o. & < 16 y.o.	60 (11.7)
Health Care Professional	
Yes	45 (8.8)
No	467 (91.2)
Diagnosed Illness	
Lupus erythematosus	405 (79.1)
Rheumatoid arthritis	107 (20.9)
Prescribed hydroxychloroquine	
Yes	420 (82.0)
No	92 (18.0)
Prescribed methotrexate	
Yes	120 (23.4)
No	392 (76.6)

(Continued)

**Table 1** (Continued).

Variable	n (%)
Comorbidities	
With at least one	315 (61.5)
Without	197 (38.5)
Symptoms	
With at least one	411 (80.3)
Without	101 (19.7)

diagnose COVID-19. On one hand, around 70% were very worried about other family members acquiring the infection while 53% had the same worries about their younger children. However, the majority (57.6%) reported that too much unnecessary worry has been made about COVID-19.

When asked about actions or habits to reduce viral transmission, 90% of the respondents enumerated covering the mouth when sneezing or coughing, washing hands with soap and water, washing hands immediately after touching contaminated objects. Others avoided sharing utensils (77%), washed their hands immediately after coughing, rubbing nose, or sneezing, and wore a mask (87.5%) most of the time.

## Current Medications and Physical Health Status

Hydroxychloroquine was prescribed to 90% of lupus respondents and 50% of rheumatoid arthritis respondents, while methotrexate was taken by 10% of lupus and 66% of rheumatoid arthritis patients. In total, 82% of the sample were on hydroxychloroquine and 23.4% on methotrexate therapy. However, 68.6% and 65%, respectively, were not able to regularly access these medicines during the quarantine period due to unavailability.

Two-thirds of the respondents rated their current health status as good. The most common symptoms experienced during the two weeks prior to the survey were pain (in their joints, muscle, and head), dizziness, and skin rash. Fever, chills, colds, cough, sore throat, difficulty of breathing, or diarrhea, which may occur either due to their rheumatic disease or COVID-19, occurred in less than 10%. Bubbly or foamy urine, facial edema, leg edema, pallor, or bleeding, which may indicate a major organ flare in lupus, were uncommon.

## Mental Health Status

Based on the DASS-21, the mean stress level of the sample is only slightly above normal (10.34, SD 8.16; normal is 0–10); 12.3% reported moderate to severe stress symptoms. Most of the respondents had mild anxiety symptoms (mean anxiety scale is 8.55, SD 7.92). About 38.7% of respondents reported moderate to severe anxiety symptoms. The mean depression subscale score (8.70, SD 8.51) was within normal; while 27.7% of respondents had moderate to extremely severe depression symptoms. The mean IES-R score was within normal (21.6, SD 14.22). Around 20% experienced at least a moderate impact of the coronavirus pandemic on their mental health.

The mean scores for all DASS-21 subscales and IES-R were higher for SLE compared to RA. In particular, stress 10.50 (SD 8.22) vs 9.78 (SD 7.9), anxiety 8.86 (SD 8.0) vs 7.38 (SD 7.58), depression 8.92 (SD 8.57) vs 7.89 (SD 8.30), and IES-R 22.34 (SD 14.39) vs 18.85 (SD 13.24). However, only IES-R was significantly higher among respondents with SLE. There was no significant difference in the proportion of those who reported moderate or worse stress, anxiety, depression symptoms, or IES-R score between the SLE and RA groups.

## Factors Affecting Mental Health Status

The presence of comorbidity of asthma; being a healthcare professional; and presence of specific symptoms of headache, myalgia, cough, breathing difficulty, dizziness and sore throat were significantly associated with adverse mental health ( $p < 0.05$ ). The presence of hypertension was associated with greater psychological impact ( $p = 0.014$ ).

Satisfaction with the available health information on COVID-19 was associated with low-stress scores ( $p = 0.011$ ) and depression subscales ( $p = 0.005$ ) and minimal psychological impact ( $p = 0.017$ ). The precautionary measure of wearing face masks was associated with lower levels of stress ( $p = 0.034$ ) and depression ( $p = 0.044$ ).

The presence of other comorbid conditions or inability to access maintenance medications (hydroxychloroquine and/or methotrexate) had no association with mental health status.

## Discussion

Depression and anxiety are frequently observed in rheumatoid arthritis or lupus erythematosus patients.<sup>32–35</sup> The current health crisis brought about by the quick spread of the SARS-Cov2 virus is a challenge to everyone's physical

and mental health. In a pandemic such as this, fear increases anxiety and stress levels in healthy individuals and intensifies the symptoms of those with pre-existing psychiatric disorders.<sup>36</sup> Although there are studies on the impact of the pandemic to the mental health of the general population or of healthcare workers,<sup>31,37–42</sup> there is none that has looked into the mental health of a perceived vulnerable group – those with rheumatoid arthritis or lupus.

Psychological stress induces the production of inflammatory cytokines (IL-6, IL-1B) in the brain that are important in the etiology of anxiety and depression. In the presence of stress, central catecholamines stimulate the release of IL-1b, a key factor in activation of microglia and recruitment of monocytes into the brain. These events are necessary during times of stress exposure but may contribute to the development of psychopathologies.<sup>43</sup>

The study by Wang et al<sup>14</sup> observed that during the initial phase of the COVID-19 outbreak in China, more than half of the respondents in the general population rated the psychological impact as moderate to severe, and about one-third reported moderate to severe anxiety. In our cohort, we saw a similar proportion of moderate to extremely severe anxiety, though with a lower proportion of moderate to severe psychological impact (20%). This gives us sufficient reason to be concerned about the mental health of our patients with RA and LE.

Our patients with SLE and RA belong to a specific segment of the population warned by the Center for Disease Control to be extra careful during COVID-19 pandemic due to their immunosuppressed status.<sup>3</sup> This warning was necessary to emphasize the need for these patients to follow disease prevention policies and practices. However, being labeled “vulnerable” may cause stress and anxiety. One other factor that may have contributed to the patients' anxieties was the conflicting reports on the effects (beneficial to harmful) of hydroxychloroquine in COVID-19 patients.<sup>44</sup> The news about the prophylactic use of hydroxychloroquine by United States President Donald Trump may serve to reassure patients who are taking the same medication.<sup>45</sup> However, the off-label uses of hydroxychloroquine for prophylaxis and treatment of COVID-19 have also contributed significantly to supply shortage in the Philippine market beginning in March up to the time of the survey. The enhanced community quarantine which limited mobility further added to the difficulty for our patients to secure their medicines and to reach their physicians to inquire for alternative drugs.

We, therefore, expected our respondents to exhibit higher incidence, not only of anxiety, but of stress, depression and posttraumatic stress disorder compared to the general population. Indeed, compared to the general population, there is higher prevalence of at least moderate anxiety (38.7% vs. 28.8%), depression (27.7% vs 16.9%) and IES-R score (20% vs. 16.3%).<sup>46</sup> The prevalence of at least moderate stress is almost comparable between the general population and patients with RA and SLE (12.3% vs. 13.4%). The survey for the general population in the Philippines was done approximately 6 weeks earlier than that for the SLE/RA subgroup and it is likely that people were becoming more accustomed to the limitations of the quarantine during the later weeks. Another possible explanation is the presence of protective factors, such as social support and optimism.<sup>33,34</sup> Most of those surveyed belonged to patient support groups in their localities and their online presence may have lessened the psychological burden of the pandemic. Most of them were also aware of the efforts of the Philippine Rheumatology Association to make hydroxychloroquine and methotrexate available in the country.

Knowing the psychological status of our patients and the factors affecting thus has provided insight and better understanding of their needs and how best to help them during these difficult times.

## Limitations of the Study

Given the restrictions imposed during this pandemic, the most practical and fastest way to reach our patients was through a survey. However, the use of an online survey methodology may have excluded individuals who do not have access or are unfamiliar with the use of the internet. In the Philippines, there are more persons with lupus who belong to patient support groups and were easily contacted through social media compared to those with rheumatoid arthritis. This has skewed the number of participants favoring those with lupus. It was not possible to obtain pre-COVID psychological status through the survey.

## Conclusion

In our cohort of lupus and rheumatoid arthritis, there was moderate to severe stress in 12.3%, moderate to extremely severe anxiety in 38.7% and depression in 27.7%. For 20% of the respondents, the COVID-19 pandemic had a moderate or worse psychological impact.

The risk factors for adverse mental health during the COVID-19 pandemic included presence of comorbidity of hypertension and asthma; being a healthcare worker; and presence of specific symptoms of myalgia, cough, breathing difficulty, dizziness and sore throat. The protective factors for mental health during the pandemic included satisfaction with available health information and wearing of face masks. Identification of these factors that affect mental health in lupus and RA is useful in the implementation of effective psychological support strategies.

## Acknowledgment

South East Asia One Health University Network

## Funding

There is no funding to report.

## Disclosure

The authors report no conflicts of interest for this work.

## References

1. World Health Organization. Coronavirus disease (COVID-2019) situation report – 203 [Internet]. 2020. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/>. Accessed August 11, 2020.
2. Department of Health, Republic of the Philippines. COVID-19 tracker [Internet]. Available from: <https://www.doh.gov.ph/covid19/tracker>. Accessed August 11, 2020.
3. Centers for Disease Control and Prevention. Coronavirus Disease 2019 (COVID-19) [Internet]. 2020. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html>. Accessed August 11, 2020.
4. Roser M, Ritchie H, Ortiz-Ospina E, Hasell J. Coronavirus Pandemic (COVID-19). 2020. OurWorldInData.org. Retrieved from: '<https://ourworldindata.org/coronavirus>'. Available from: <https://ourworldindata.org/mortality-risk-covid>. Accessed August 11, 2020.
5. Beeching NJ, Fletcher TE, Fowler R. Coronavirus disease 2019 (COVID-19). 2020. In: *BMJ Best Practice [Internet]*. London: BMJ Publishing Group Ltd; 2020. Available from: <https://bestpractice.bmj.com/topics/en-gb/3000168>. Accessed September 7, 2020.
6. Park A. WHO resumes study of hydroxychloroquine for treating COVID 19. *Time*. 2020. Available from: <https://time.com/5847664/who-hydroxychloroquine-covid-19/>. Accessed June 11, 2020.
7. Fanouriakis A, Kostopoulou M, Alunno A, et al. Update of the EULAR recommendations for the management of systemic lupus erythematosus. *Ann Rheum Dis*. 2019;2019(78):736–745. doi:10.1136/annrheumdis-2019-215089
8. The HERA Study Group. A randomized trial of hydroxychloroquine in early rheumatoid arthritis: the HERA study. *Am J Med*. 1995;98(2):156–168. doi:10.1016/s0002-9343(99)80399-4
9. Hung Y, Wang Y, Lin L, Wang P, Chiou J, Wei J. Hydroxychloroquine may be associated with reduced risk of coronary artery diseases in patients with rheumatoid arthritis: a nationwide population-based cohort study. *Int J Clin Pract*. 2018;72:e13095. doi:10.1111/ijcp.13095
10. Mehta B, Salmon J, Ibrahim S. Potential shortages of hydroxychloroquine for patients with lupus during the coronavirus disease 2019 pandemic. *JAMA Netw*. 2020. Available from <https://jamanetwork>.

- com/channels/health-forum/fullarticle/2764607#top. Accessed September 7, 2020.
11. Mehra M, Desai S, Ruschitzka F, Patel A. Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: a multinational registry analysis. *Lancet*. 2020. Available from [https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(20\)31180-6.pdf](https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)31180-6.pdf). Accessed September 7, 2020.
  12. Salari N, Hosseini-Far A, Jalali R, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: a systematic review and meta-analysis. *Global Health*. 2020;16(1):57. doi:10.1186/s12992-020-00589-w
  13. Rajkumar RP. COVID-19 and mental health: a review of existing literature. *Asian J Psychiatry*. 2020;52:102066. doi:10.1016/j.ajp.2020.102066
  14. Wang C, Pan R, Wan X, et al. 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*. 2020;17(5):1729. doi:10.3390/ijerph17051729
  15. Wang C, Pan R, Wan X, et al. A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain Behav Immun*. 2020;S0889-S1591(20):30511. doi:10.1016/j.bbi.2020.04.028
  16. Official Gazette Philippines. Memorandum from the executive secretary on community quarantine over the entire luzon and further guidelines for the management of the Coronavirus Disease 2019 (COVID-19) situation. 2020. Available from: <https://www.officialgazette.gov.ph/2020/03/16/memorandum-from-the-executive-secretary-on-community-quarantine-over-the-entire-luzon-and-further-guidelines-for-the-management-of-the-coronavirus-disease-2019-covid-19-situation/>. Accessed September 7, 2020.
  17. Norton PJ. Depression Anxiety and Stress Scales (DASS-21): psychometric analysis across four racial groups. *Anxiety Stress Coping*. 2007;20(3):253–265. doi:10.1080/10615800701309279
  18. González-Cabrera J, Tourón J, Machimbarrena JM, Gutiérrez-Ortega M, Álvarez-Bardón A, Garaigordobil M. Cyberbullying in gifted students: prevalence and psychological well-being in a Spanish sample. *Int J Environ Res Public Health*. 2019;16(12):2173. doi:10.3390/ijerph16122173
  19. Cheung JTK, Tsoi VWY, Wong KHK, Chung RY. Abuse and depression among Filipino foreign domestic helpers. A cross-sectional survey in Hong Kong. *Public Health*. 2019;166:121–127. doi:10.1016/j.puhe.2018.09.020
  20. Ho CSH, Tan ELY, Ho RCM, Chiu MYL. Relationship of anxiety and depression with respiratory symptoms: comparison between depressed and non-depressed smokers in Singapore. *Int J Environ Res Public Health*. 2019;16(1):163. doi:10.3390/ijerph16010163
  21. Quek TC, Ho CS, Choo CC, Nguyen LH, Tran BX, Ho RC. Misophonia in singaporean psychiatric patients: a Cross-Sectional Study. *Int J Environ Res Public Health*. 2018;15(7):1410. doi:10.3390/ijerph15071410
  22. Lovibond SH, Lovibond PF. *Manual for the Depression Anxiety Stress Scales*. 2nd ed. Sydney: Psychology Foundation; 1995.
  23. Creamer M, Bell R, Failla S. Psychometric properties of the impact of event scale - revised. *Behav Res Ther*. 2003;41(12):1489–1496. doi:10.1016/j.brat.2003.07.010
  24. Horowitz MJ, Wilner N, Alvarez W. The impact of event scale: a measure of subjective stress. *Psychosom Med*. 1979;41:209–218. doi:10.1097/00006842-197905000-00004
  25. Hosey MM, Bienvenu OJ, Dinglas VD, et al. Remains a core outcome measure for PTSD in critical illness survivorship research. *Crit Care*. 2019;23(1):362. doi:10.1186/s13054-019-2630-3
  26. Beck JG, Grant DM, Read JP, et al. The impact of event scale-revised: psychometric properties in a sample of motor vehicle accident survivors. *J Anxiety Disord*. 2008;22(2):187–198. doi:10.1016/j.janxdis.2007.02.007
  27. Zhang MW, Ho CS, Fang P, Lu Y, Ho RC. Usage of social media and smartphone application in assessment of physical and psychological well-being of individuals in times of a major air pollution crisis. *JMIR Mhealth Uhealth*. 2014;2(1):e16. doi:10.2196/mhealth.2827
  28. Reynolds DL, Garay JR, Deamond SL, Moran MK, Gold W, Styra R. Understanding, compliance and psychological impact of the SARS quarantine experience. *Epidemiol Infect*. 2008;136(7):997–1007. doi:10.1017/S0950268807009156
  29. Chew NWS, Lee GKH, Tan BYQ, et al. A multinational, multicentre study on the psychological outcomes and associated physical symptoms amongst healthcare workers during COVID-19 outbreak. *Brain Behav Immun*. 2020;88:559–565. doi:10.1016/j.bbi.2020.04.049
  30. F TW H, Jang L, Zhang L, et al. Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry. *Brain Behav Immun*. 2020;87:100–106. doi:10.1016/j.bbi.2020.04.069
  31. Tan BYQ, Chew NWS, Lee GKH, et al. Psychological impact of the COVID-19 pandemic on health care workers in Singapore [published online ahead of print, 2020 Apr 6]. *Ann Intern Med*. 2020;M20-M1083. doi:10.7326/M20-1083
  32. Peterson S, Piercy J, Blackburn S, Sullivan E, Karyekar C, Li N. The multifaceted impact of anxiety and depression on patients with rheumatoid arthritis. *BMC Rheumatol*. 2019;3:43. doi:10.1186/s41927-019-0092-5
  33. Azizoddin D, Zamora-Racaza G, Ormseth S, et al. Psychological factors that link socioeconomic status to depression/anxiety in patients with systemic lupus erythematosus. *J Clin Psychol Med Settings*. 2017;24:302–315. doi:10.1007/s10880-017-9505-z
  34. Zamora-Racaza G, Azizoddin DR, Ishimori ML, et al. Role of psychosocial reserve capacity in anxiety and depression in patients with systemic lupus erythematosus. *Int J Rheum Dis*. 2018;21:850–858. doi:10.1111/1756-185X.13033
  35. Mills SD, Azizoddin D, Gholizadeh S, Racaza GZ, Nicassio PM. The mediational role of helplessness in psychological outcomes in systemic lupus erythematosus. *Lupus*. 2018;27(7):1185–1189. doi:10.1177/0961203317751046.15
  36. Ornell F, Schuch JB, Sordi AO, Kessler FHP. “Pandemic fear” and COVID-19: mental health burden and strategies [published correction appears in *Braz J Psychiatry*. 2020;42(3):333]. *Braz J Psychiatry*. 2020;42(3):232–235. doi:10.1590/1516-4446-2020-0008(18)
  37. Geldsetzer P. Use of rapid online surveys to assess people’s perceptions during infectious disease outbreaks: a cross-sectional survey on COVID-19. *J Med Internet Res*. 2020;22(4):e18790. doi:10.2196/18790
  38. Kang L, Li Y, Hu S, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry*. 2020;7:e14. doi:10.1016/S2215-0366(20)30047-X
  39. Roy D, Tripathy S, Kar SK, Sharma N, Verma SK, Kaushal V. Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian J Psychiatry*. 2020;51:102083. doi:10.1016/j.ajp.2020.102083
  40. Xiang YT, Yang Y, Li W, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *Lancet Psychiatry*. 2020;7:228–229. doi:10.1016/S2215-0366(20)30046-8
  41. Grover S, Sahoo S, Mehra A, Avasthi A, Subramanyan A. Psychological impact of COVID-19 lockdown: an online survey from India. *Indian J Psychiatry*. 2020;62:354–362. doi:10.4103/psychiatry.IndianJPsychiatry\_427\_20
  42. Li Z, Ge J, Yang M, et al. Vicarious traumatization in the general public, members, and non-members of medical teams aiding in COVID-19 control. *Brain Behav Immun*. 2020;88:916–919. doi:10.1016/j.bbi.2020.03.007
  43. Liu Y, Ho RC, Mak A. The role of interleukin (IL)-17 in anxiety and depression of patients with rheumatoid arthritis. *Int J Rheum Dis*. 2012;15(2):183–187. doi:10.1111/j.1756-185X.2011.01673.x

44. Gautret P, Lagier JC, Parola P, et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial. *Int J Antimicrob Agents*. 2020;20:105949. doi:10.1016/j.ijantimicag.2020.105949
45. Roberts M. Coronavirus: trump says he is taking unproven drug hydroxychloroquine. BBC News. May 19, 2020. Available from: <https://www.bbc.com/news/world-us-canada-52717161>. Accessed June 11, 2020.
46. Tee ML, Tee CA, Anlacan JP, Aligam KJG, Reyes PWC, Kuruchittham V, Ho RC. Psychological impact of COVID-19 pandemic in the Philippines. *J Affect Disord*. 2020 Aug 24. doi:10.1016/j.jad.2020.08.043. Epub ahead of print. PMID: PMC7444468.

### Open Access Rheumatology: Research and Reviews

Dovepress

#### Publish your work in this journal

Open Access Rheumatology Research and Reviews is an international, peer-reviewed, open access journal publishing original research, reports, editorials, reviews and commentaries on all aspects of clinical and experimental rheumatology in the clinic and laboratory including the following topics: Pathology, pathophysiology of rheumatological diseases; Investigation, treatment and management

of rheumatological diseases; Clinical trials and novel pharmacological approaches for the treatment of rheumatological disorders. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/open-access-rheumatology-research-and-reviews-journal>