

psychosis.⁴ Psychosis post-NIH1-virus infection in children was associated with viral-induced brain-reactive autoantibodies production.⁵ Severance *et al.*⁶ found a higher level of immunoglobulin G against four different human coronavirus strains in adults diagnosed with psychosis versus controls. An interesting aspect of the case reported is the concomitant occurrence of the psychotic episode and the pulmonary thromboembolism, as both thrombotic phenomena and neuropsychiatric symptoms have been recently described as potential sequelae of the inflammatory storm and the immunoreactivity associated with COVID-19.^{7, 8}

The hypothesis of the occurrence of psychosis as an adverse reaction to some of the treatments used for COVID-19, such as hydroxychloroquine or corticosteroids, was also considered but found improbable, as no temporary correlation existed between these treatments' administration and the onset of psychosis, with more than a 2-week period between the two events. In fact, in a review of adverse reactions reported in chloroquine-treated patients between 2012 and 2019,⁹ no statistically significant reporting of psychosis was found.

Overall, the current case report illustrates the possibility of a psychosis break as a COVID-19 clinical presentation. Though its underlying mechanisms are still unknown, the existing evidence from scientific literature suggests a potential participation of inflammatory and auto-immunologic phenomena triggered as a response to the coronavirus infection. More investigation on the basis of neuropsychiatric complications of COVID-19, such as onset of psychosis, is needed to ratify this hypothesis.

The patient provided informed consent and his anonymity has been preserved. This report confirms the new clinical and management challenges for professionals and the Mental Health Network.¹⁰

Disclosure statement



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Synergistic effect of social media use and psychological distress on depression in China during the COVID-19 epidemic

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The COVID-19 pandemic is expected to have long-term effects on mental health with implications at a population health level. While limiting the transmission of the virus, lockdown measures subject individuals to significant psychological distress and interpersonal isolation, which may increase risk for depression, a chronic and disabling disease associated with tremendous societal, individual, and economic costs (e.g., workplace productivity loss, unemployment, work absence, and long-term disability).¹ In addition to the elevated risk of depression and loneliness attributable to frequent and prolonged social media (SM) use outside the context of epidemics, frequent exposure to fearful and exaggerated information through SM can exacerbate psychological and emotional distress.^{2,3}

We investigated the impact of SM use and psychological and emotional distress on depression in 3064 adults in Mainland China. A national convenience sample of 2574 health-care workers and 490 non-medical workers in China was surveyed cross-sectionally by telephone or WeChat between 29 January and 11 February 2020. Our study participants consisted of physicians ($n = 783$), nurses ($n = 1587$), and other medical staff ($n = 204$) employed in health-care settings providing direct care for patients in hospitals, as well as 490 adults not employed in a health-care setting (Table S1). The study was approved by the Institutional Review Board at Renmin Hospital of Wuhan University (No. WDRY2020-K004). Detailed methods and results are available in the Supplementary Information.

We assessed the effect of SM use and psychological and emotional distress (according to the Hyperarousal, Intrusion, and Avoidance subscales of the 22-item Impact of Event Scale – Revised [IES-R]) on depressive symptom severity (according to the 9-item Patient Health Questionnaire [PHQ-9]). Greater IES-R and PHQ-9 scores indicate greater severity. Participants were asked about their use of SM to obtain information about COVID-19.

We analyzed PHQ-9 score as a continuous outcome variable using generalized linear models with a negative binomial distribution and as a dichotomous outcome variable using binomial logistic regression models (reported in Supplementary Information). We evaluated the synergistic effect of prolonged SM use to obtain information about COVID-19 and psychological and emotional distress as a result of the epidemic on the risk

for depression in Mainland China. We evaluated whether the odds of depressive symptoms with more prolonged SM use and greater psychological and emotional distress were significantly greater than the sum of the odds of depressive symptoms with more prolonged SM use alone and with greater distress alone. We calculated a synergy index and relative excess risk due to interaction to model interaction effects, with adjustments for age, sex, educational attainment, marital status, living arrangements, and health-care/non-health-care-worker status separately for each IES-R subscale.^{4,5}

The mean (standard error) PHQ-9 score among study participants was 5.2 (0.1), denoting the presence of clinically significant depressive symptoms. Approximately 18.1% ($n = 554$) of all participants reported spending less than 1 h per day on an SM platform in the past week, 41.6% ($n = 1306$) reported spending 1–2 h per day, 22.5% ($n = 689$) reported spending 3–4 h per day, and 16.8% ($n = 515$) reported spending more than 5 h per day on an SM platform. Greater time spent on SM predicted greater depressive symptom severity (Fig. S1). IES-R Intrusion and Hyperarousal subscale scores significantly predicted PHQ-9 scores, while the Avoidance subscale scores did not (Table S1).

Individuals reporting both prolonged SM use (i.e. ≥ 3 h per day) and significant symptoms of distress, particularly hyperarousal, had significantly higher odds of having depressive symptoms or probable depression relative to individuals with either factor alone (Fig. 1). That is, the odds of depression with prolonged SM use and significant hyperarousal symptoms were significantly greater than the sum of the odds of depression with prolonged SM use (in the absence of significant hyperarousal) and hyperarousal (with reduced SM use), as instantiated by a positive synergistic effect (Table S2).

SM networks can be used to provide reassurance, increase public awareness about effective ways to reduce risk of infection, and

communicate practical information to curb public panic and reduce the mental health burden of public health crises.⁶ However, SM use is also associated with elevated risk for depression: greater symptoms of depression and loneliness are observed in young adults who use SM extensively.^{7,8} Moreover, during public health crises, SM can aggravate public fear and panic: for example, SM networks have been implicated in the spread of false information and amplification of risk and harm during the 2014 Ebola outbreak.⁹ There is an urgent and unmet need to address the impact of COVID-19 on the mental health of affected individuals.

Data are available on request from the authors.

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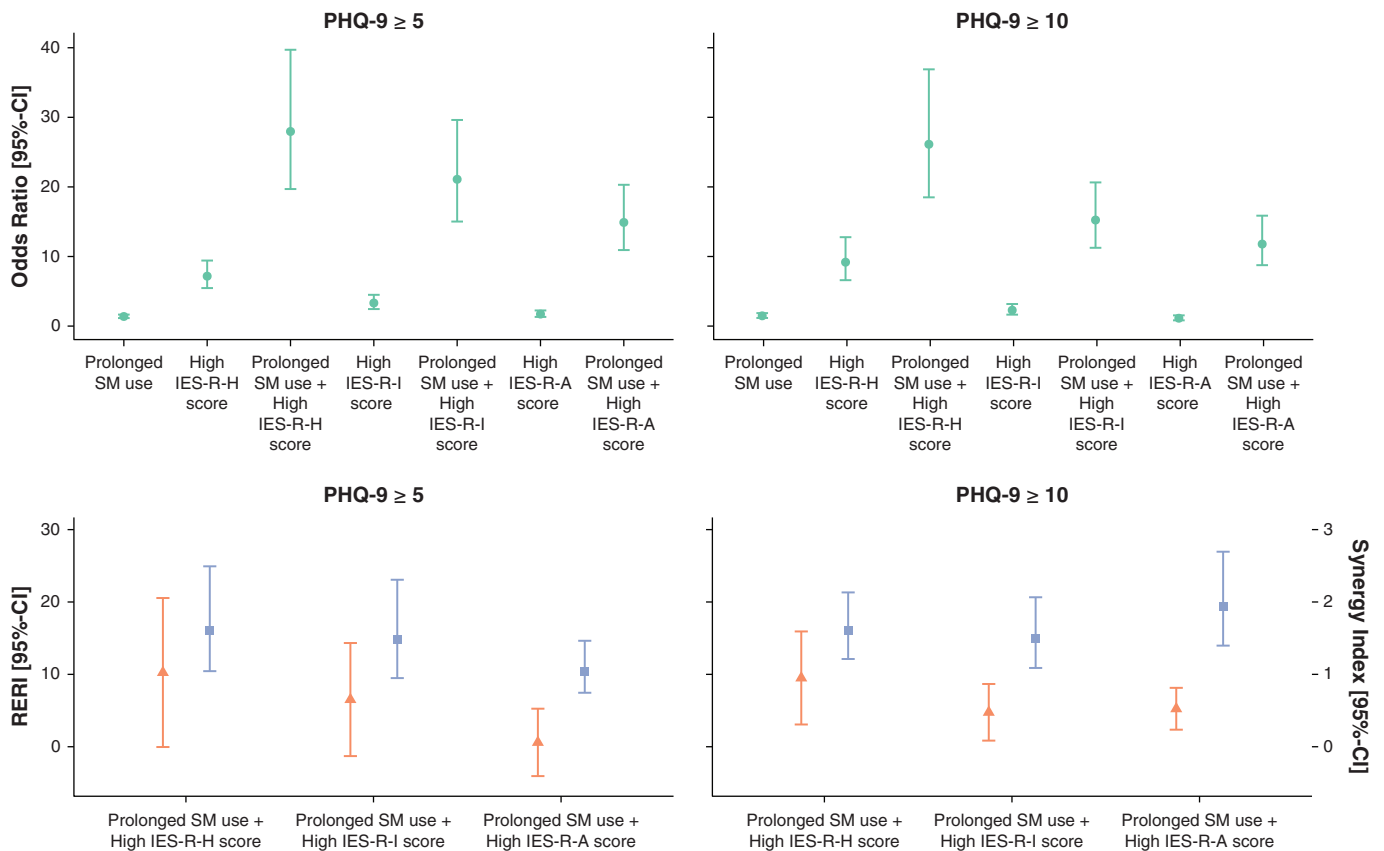


Fig. 1 The co-occurrence of prolonged social media (SM) use and significant distress increases odds for depression. Odds ratio, relative excess risk due to interaction (RERI), and synergy index were calculated with adjustment for age, sex, educational attainment, marital status, living arrangements, and health-care/non-health-care-worker status. CI, confidence interval; IES-R-A, Avoidance subscale of the 22-item Impact of Event Scale – Revised; IES-R-H, Hyperarousal subscale of the 22-item Impact of Event Scale – Revised; IES-R-I, Intrusion subscale of the 22-item Impact of Event Scale – Revised; PHQ-9, 9-item Patient Health Questionnaire. (▲) Relative Excess Risk due to Interaction (RERI). (■) Synergy Index.

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Supporting information




Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix S1 Supplementary information.

Figure S1 Mean 9-item Patient Health Questionnaire (PHQ-9) scores are significantly higher among individuals with more prolonged social media use. Marginal means reported after adjustment for age, sex, educational attainment, marital status, living arrangement, and health-care/non-health-care-worker status.

Table S1 Demographics and summary of model effects on depressive symptom severity (according to the 9-item Patient Health Questionnaire [PHQ-9] total score as a continuous variable).

Table S2 Predictors of depressive symptoms.

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Anxiety and depression in patients with confirmed and suspected COVID-19 in Ecuador

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The rapid spread of the novel coronavirus, SARS-CoV-2 throughout the world has forced local and national administrations to take unprecedented measures to reduce the impact of the coronavirus diseases (COVID-19) pandemic.¹ In South America, the arrival of the virus took longer than in other regions of the world, nevertheless, the impact has already been unprecedented. For instance, Ecuador was one of the most affected countries by the pandemic, reported hundreds of deaths each day during the last weeks of March and the first weeks of April 2020.² The mortality rates were high during these months due to late implementation of restrictive measures of social distancing and limited capacity of health services (testing capacities and contact tracing). In this scenario, the Ecuadorian Ministry of Public Health (MoPH) established an epidemiological surveillance program for COVID-19 confirmed and suspected patients. The Department of Mental Health at the MoPH in Ecuador lead an active surveillance of the emotional impact of the disease by deploying an online self-reporting tool among patients to identify needs and provide standard of care treatment. The authors of this study were asked to participate in the development of this survey. The tool recorded sociodemographic variables and responses from two questionnaires: the Patient Health Questionnaire (PHQ-9)³ to measure the presence and severity of depressive symptoms, and the Generalized Anxiety Disorder (GAD-7)⁴ to assess the presence and severity of anxiety symptoms.

Once collected, and after serving its clinical purpose, the information was deidentified and made available for research purposes. All participants included in the analyses were adults who had provided informed consent during data collection. We present here a secondary data analysis of the study conducted by Ortiz-Prado *et al.*² which received an exemption from the Universidad de las Américas Ethics Committee.

In total, 759 persons under epidemiological surveillance for COVID-19 completed the survey, 40.3% were confirmed and 59.7% were suspected cases. Comparisons of demographic and clinical characteristics of confirmed and suspected patients can be found in Table 1. No significant differences were found for the proportion of males in each group. The mean age of the confirmed was higher than the suspected cases. No significant differences were found regarding the prevalence of depression and anxiety when comparing confirmed and suspected cases. However, the distribution of the patients according to the severity of depressive symptoms was different in the two populations. Confirmed patients presented higher symptom endorsement.

Zhang *et al.*⁵ conducted a similar study in China, although with a smaller number of participants, but also comparing with the general population. The prevalence of depression was higher in their study (29.2%) for confirmed patients, but lower in suspected cases (9.8%) than in our data. Regarding the prevalence of anxiety, our study showed higher levels of anxiety in both confirmed (24.2% vs 20.8%) and suspected patients (21.4% vs 10.2%) than those in the study by Zhang *et al.*⁵ study. The presence of higher anxiety symptoms might be explained by the critical situation that the Ecuadorian health system was going through at that time. Of note, only 28.6% met the cut-off for moderate to severe