psychosis.5 Psychosis post-N1H1-virus infection in children was associated with viral-induced brain-reactive autoantibodies production.7 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 autoimmunologic 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
Dr Susana Majadas, Dr Javier Pérez, Dr Nerea Casado-Espada, Dr Zambrana, and Dr Alberto Bullón have no conflicts of interest to declare. Dr Carlos Roncero has received fees to give lectures for Janssen-Cilag, Indivior, Lundbeck, Otsuka, Servier, GSK, Astra, Gilead, MSD, Sanofi, Excelsis, Abbvie, Taisho, Takeda, and Casein. He has received financial compensation for his participation as consultant or a board member of Lundbeck, Gilead, MSD, Mundipharma, INDIVIOR, Excelsis, Martindale, Camurus, Gebro, and Abbvie Board. He has carried out the PROTEUS project, which was funded by a grant from Reckitt-Benckiser/Indivior, and the COSTEDOPIA project, which was funded by INDIVIOR. He has received two medical education grants from Gilead. No funding was received for this work.

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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 healthcare/non-healthcare-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 healthcare/non-healthcare-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.
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.,5 which received an exemption from the Universidad de las Americas 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.6 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%) 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.6 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

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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-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.