



LETTERS TO THE EDITOR

Putative impact of the COVID-19 pandemic on anxiety, depression, insomnia and stress



KEYWORDS

COVID-19;
Anxiety;
Depression;
Insomnia and stress

Dear Editor,

We read with interest the article of Walker and McCabe,¹ highlighting that coronavirus disease 2019 (COVID-19) may trigger highly adverse effects on mental health, with many individuals experiencing psychological distress, depression, and anxiety.

To provide additional evidence on this matter, we performed an electronic search in Google Trends (Google Inc. Mountain View, CA, US), using the search terms “anxiety,” “depression,” “insomnia,” and “stress.” We set the country option to “United States” to enhance accuracy of the search results for these English keywords. The search period was extended over the previous 2 years (i.e., between November 2018 and November 2020), while the number of new weekly diagnoses of COVID-19 in the US was obtained from the official website of the US Centers for Disease Control and Prevention (CDC). The correlation between the number of new COVID-19 cases and the volume of Google searches for the four keywords during the same week was analyzed with both univariate (Spearman’s correlation) and multivariate (multiple linear regression) analyses. The statistical analysis was carried out using Analyse-it (Analyse-it Software Ltd, Leeds, UK). The study was conducted in accordance with the Declaration of Helsinki, under the terms of relevant local legislation.

When the volume of Google searches recorded for the four symptoms after the explosion of the COVID-19 outbreak in the US (i.e., from March 1, 2020, onward) was compared to that in the period before, a significantly higher Google Trends score was found for insomnia (83.8 ± 9.7 vs. 73.1 ± 6.0 ; $p < 0.001$), while the Google Trends score for depression was significantly lower (73.2 ± 10.0 vs.

78.0 ± 10.6 ; $p = 0.014$). No significant differences were found for the Google Trends score of anxiety (93.2 ± 5.1 vs. 91.7 ± 4.8 ; $p = 0.070$) or stress (82.6 ± 8.0 vs. 83.7 ± 10.2 ; $p = 0.284$) after and before the outbreak. The number of new weekly diagnoses of COVID-19 in the US from March 2020 to present was found to be positively correlated with anxiety ($r = 0.41$; 95% CI, 0.09 to 0.65; $p = 0.013$) and insomnia ($r = 0.63$; 95% CI, 0.37 to 0.79; $p < 0.001$), while it was negatively correlated with depression ($r = -0.48$; 95% CI, -0.70 to -0.18 ; $p = 0.003$). No significant correlation was found for stress ($r = 0.03$; 95% CI, -0.30 to 0.36 ; $p = 0.857$). In multivariate analysis, new COVID-19 diagnoses remained positively associated with insomnia (β coefficient, 7039; $p = 0.004$) and negatively associated with depression (β coefficient, -7562 ; $p < 0.001$), while the association with anxiety was no longer statistically significant (β coefficient, 3840; $p = 0.379$) (Fig. 1).

It has been demonstrated that fluctuations in psychological distress-related internet queries can be reliably used for capturing the adverse impacts of a given pathology on mental health.² Thus, the use of internet queries for assessing psychological health have been recently emphasized for COVID-19.³ The results of our analysis suggest that COVID-19 may have caused some negative psychological consequences, particularly highlighted by the higher volume of Google searches for insomnia recorded throughout the outbreak (+15%). On the other hand, the impact of the virus on anxiety and stress search trends seems less pronounced, yet mirroring the results reported in previous investigations.^{4,5} Suitable public health measures should hence be considered to prevent the emergence of widespread sleep disturbances during the ongoing COVID-19 pandemic outbreak, especially during periods characterized by higher viral circulation.

Interestingly, we found a negative association between the progression of COVID-19 outbreak in the US and the volume of Google searches for depression. This association was largely unexpected, as previous studies, such as a recent meta-analysis by Deng et al.,⁴ demonstrated prevalence of depression as high as 45% in COVID-19 patients. Similar evidence has been reported in the general population,⁵ with depression prevalence of approximately 34%. Further studies are thus needed to address the possible interplay between the progression of COVID-19 pandemic and the burden of depressive disorders in the general population.

<https://doi.org/10.1016/j.ejpsy.2020.11.006>

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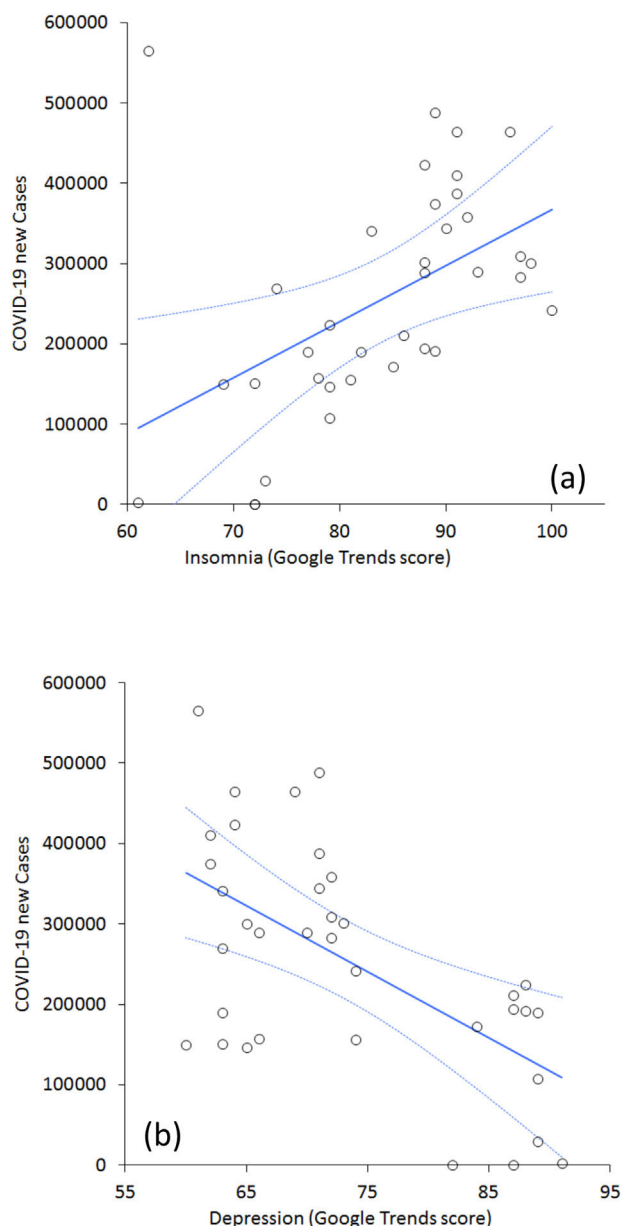


Fig. 1 Correlation between the new weekly diagnoses of coronavirus disease 2019 (COVID-19) in the US and the volume of Google searches for the terms “insomnia” (a) and “depression” recorded (b) recorded during the same week in the country.

Ethical considerations

Ethical approval was not required for this research article as only deidentified data from publicly available databases was used.

Funding

No funding used for this article.

Conflict of interest

None to declare by the authors.

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18 November 2020