Web searches for anxiolytic drugs during the COVID-19 outbreak in the USA

Several lines of evidence attest that the ongoing coronavirus disease 2019 (COVID-19) pandemic is accompanied by a vast array of physiological problems in the community.\(^1\) Since the emergence or magnification of anxiety disorders in the general population has also been suggested during the COVID-19 outbreak,\(^2\) we aimed to provide further insights on this matter by performing an electronic search in Google Trends (Google Inc, Mountain View, CA, USA), using the terms corresponding to the most common anxiolytic medicines used in the USA (ie, ‘Alprazolam’, ‘Diazepam’, ‘Lorazepam’, and ‘Clonazepam’) along with their brand names (‘Xanax’, ‘Valium’, ‘Ativan’, and ‘Klonopin’, respectively), and setting the country option to ‘United States’. The weekly Google Trends score recorded for each of the keywords after the emergence of the COVID-19 outbreak in the USA (ie, between 19 January to 18 November 2020) was compared with the average score recorded during each corresponding week of the previous 4 years (ie, between 19 January 2016 to 8 November 2019). The overall number of new weekly diagnoses of COVID-19 in the USA was also retrieved from the US Centres for Disease Control and Prevention (CDC) website. Comparison between the Google Trends scores before and after the emergence of the COVID-19 outbreak in the USA was carried out with the Mann-Whitney U test, while the correlation between new weekly cases of COVID-19 and the volume of Google searches for the four keywords during the same week of the year was analysed with Spearman’s correlation. 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. The analysis was based on electronic searches in open, publicly available repositories, and thereby no informed consent or ethical committee approvals were required.

The trend of the volume of weekly Google searches for the four keywords and the number of new weekly cases of COVID-19 in the USA are summarised in figure 1. A clear trend towards a reduction in weekly Google searches for the four anxiolytics could be observed throughout the study period, such that the Google Trends scores for all four drugs were found to be lower during the 43 weeks of the COVID-19 outbreak in the USA than in the corresponding weeks of the previous 4 years. More specifically, the weekly Google Trends score of alprazolam decreased from an average of 68.3±8.7

Figure 1  Trends of new weekly diagnoses of coronavirus disease 2019 (COVID-19) in the USA and volume of Google searches for the antidepressant drugs ‘Alprazolam’, ‘Diazepam’, ‘Lorazepam’, and ‘Clonazepam’ in the country between January 2016 and November 2020.
PostScript
during the last 4 years to 50.6±3.0 in 2020
(−25.9%; p<0.001), that of diazepam decreased from 19.6±1.9 to 18.3±2.3
(−6.4%; p<0.001), that of lorazepam fell from 25.9±2.8 to 23.3±1.5 (−10.0%;
p<0.001), and that of clonazepam was reduced from 24.0±1.6 to 19.6±1.5
(−18.3%; p<0.001), respectively. The results were unchanged when using the
brand name of the drug.
When the volume of Google searches recorded for the four antidepressant
drugs after explosion of the COVID-19 outbreak in USA was also correlated with
the number of new weekly diagnoses of COVID-19, a significant inverse associa-
tion could be noted with alprazolam (r=−0.47, 95% CI −0.67 to −0.19; p=0.002),
while no significant association was found with diazepam (r=−0.10, 95% CI
−0.39 to 0.21; p=0.531), lorazepam (r=−0.15, 95% CI −0.43 to 0.16; p=0.352),
and clonazepam (r=−0.14, 95% CI −0.43 to 0.16; p=0.359), respec-
tively. These results were consistent with the results obtained when using the
brand names.
Our analysis highlights that the impact of COVID-19 on anxiety disorders may
not be as straightforward as previously reported and hence requires additional
investigation and analysis. Overall, rather than finding an increased internet
interest in anxiolytic drugs during the US outbreak of COVID-19, we found that the
volume of Google searches for four of the most used anti-anxiety medications decreased
significantly compared with previous years. Interestingly, we either failed to
find statistically significant correlations between the volume of Google searches
for these drugs in parallel with the epidemiologic trend of COVID-19 (diazepam,
lorazepam, clonazepam), or we paradoxically found an inverse association with
the number of new COVID-19 weekly diagnoses (alprazolam). These findings
were unexpected, as several reports have noted that increased anxiety and depres-
sive symptoms have been observed during the COVID-19 outbreak compared with
historical norms.1–3

Giuseppe Lippi1 Brandon M Henry,2 Fabian Sanchis-Gomar 3
1Section of Clinical Biochemistry, University of Verona, Verona, Italy
2Cincinnati Children’s Hospital Medical Center, Cincinnati, Ohio, USA
3Department of Physiology, University of Valencia, Valencia, Comunitat Valenciana, Spain
Correspondence to Dr Fabian Sanchis-Gomar, Department of Physiology, University of Valencia, Valencia, Comunitat Valenciana, Spain; fabian.sanchis@uv.es

Contributors GL: conception and design. GL: acquisition of data. GL, FS-G, BMH: data analysis. GL, FS-G, and BMH: writing of the manuscript and interpretation of the data.
Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.
Competing interests None declared.
Patient consent for publication Not required.
Provenance and peer review Not commissioned; internally peer reviewed.
This article is made freely available for use in accordance with BMJ’s website terms and conditions for the duration of the COVID-19 pandemic or until otherwise determined by BMJ. You may use, download and print the article for any lawful, non-commercial purpose (including text and data mining) provided that all copyright notices and trade marks are retained.
© European Association of Hospital Pharmacists 2021. No commercial re-use. See rights and permissions. Published by BMJ.

doi:10.1136/ejhpharm-2020-002671
ORCID iD Fabian Sanchis-Gomar http://orcid.org/0000-0003-0424-4208

REFERENCES