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## Sleep Medicine

(Abstracts and Case Report/Series)

# The Impact of COVID-19 on Internet Searches for Sleep and Mental Health: A Google Trends Study

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## Introduction:

The widespread impact of COVID-19 on physical health, social isolation, and economic activity may be associated with an exacerbation of mood and sleep disturbances. Preliminary studies have shown that the COVID-19 pandemic has resulted in an increased prevalence of insomnia, anxiety, and other mental health problems, however the magnitude of the impact is not well known.<sup>1-3</sup> Google Trends is an online tool that provides a platform for monitoring real-time health-seeking behaviours and may aid with early characterization of the impact of COVID-19 on sleep and other mental health concerns.<sup>3,4</sup> The objective of this study was to identify the impact of COVID-19 on Google search interest in sleep, alcohol, cannabis, anxiety, and suicide across Canada, and to identify correlations between these search terms with COVID-19 cases in Canada and worldwide.

## Methods:

Publicly available Internet search query data were obtained using Google Trends for the search terms “sleep”, “alcohol”, “cannabis”, “suicide”, and “anxiety” in Canada during the time period of January 1, 2017 to January 16, 2022. Interrupted time series analysis using autoregressive integrated moving average (ARIMA) modelling were used to estimate the effect of the pandemic on Google searches for sleep. Significant increases were defined as the actual weekly search value being higher than the 95% confidence intervals (CIs) of the forecast from the 3-year baseline. We also used univariable linear regression to examine the correlation between COVID-19 case numbers in Canada and worldwide with increases in Google search volumes for sleep, alcohol, cannabis, suicide, and anxiety in Canada.

## Results:

The COVID-19 pandemic resulted in an increase in Google searches for “sleep” with an estimated change determined to be 3.101 (95% CI:0.991-5.211) units of search data. This effect gradually decreased to pre-pandemic values over time, with an estimated change of slope of -0.051 (95%CI: -0.14-0.037). The occurrence of COVID-19 in Canada and worldwide increased the number of Google searches for sleep by 1.495 (95%CI: 0.942-2.047) and 1.518 (95%CI: 0.968-2.067), respectively. Significant associations between COVID-19 cases in Canada and worldwide were also found for anxiety (0.295 [95%CI: 0.049-0.53] and 0.336 [95%CI: 0.092-0.579], respectively) and suicide (-1.039 [95%CI: -1.256-0.821] and -1.035 [95% CI: -1.252-0.818], respectively). In contrast, no significant associations between COVID-19 cases and Google searches for cannabis or alcohol were found.

**Discussion:**

Internet searches increased during the pandemic, potentially driven by sleep health disruption, anxiety, and to search for possible management strategies. It is possible that other searches became more popular as people learned to cope with sleep disturbances and began searching for other terms. The number of COVID-19 cases were correlated with sleep, anxiety, suicide, but not cannabis or alcohol, suggesting an increased prevalence of mental health problems, but no increased interest in substance use as a coping method. Future research is needed to evaluate trends across Canada in order to identify areas of need and provide sleep health solutions.

**References:**

1. Daly M, Sutin AR, and Robinson E. Longitudinal changes in mental health and the COVID-19 pandemic: evidence from the UK Household Longitudinal Study. *Psychological Medicine*. 2020;1-10.
2. Jahrami H, BaHammam AS, Bragazzi NL, et al. Sleep problems during the COVID-19 pandemic by population: a systematic review and meta-analysis. *Journal of Clinical Sleep Medicine*. 2021;17(2):299-313.
3. Nuti SV, Wayda B, Ranasinghe I, et al. The Use of Google Trends in Health Care Research: A Systematic Review. *PLOS one*. 2014;9(10):e109583.
4. Zitting K, Lammers-van der Holst HM, Yuan RK, et al. Google Trends reveals increases in internet searches for insomnia during the 2019 coronavirus disease (COVID-19) global pandemic. *Journal of Clinical Sleep Medicine*. 2021;17(2):177-184.

Figure 1:

