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Significantly Increased Public Interest in Sleep Disorder during the COVID-19 Pandemic: An Analysis of Google Trends Data

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Abstract

Background: The COVID-19 pandemic has had a profound impact on sleep disorders. Previous studies have shown that people's sleep time is delayed. **Methods:** Analyze the public's interest to the keyword "sleep disorder" during the COVID-19 pandemic from December 2019 to December 2022 using Google Trends. The study also focused on the search trend data of the top three countries with high to low overall search frequency for this keyword. **Results:** It has been observed that during the peak period of the COVID-19 pandemic, the public's search interest for "sleep disorder" has significantly increased. Analyzing Google Trends from December 2019 to December 2022, the top three countries with high interest in searching for "sleep disorder" are the United States, the Philippines, and Canada. It shows that search interest in the United States is an increasing trend year by year, and the overall trend is relatively stable. The search trend for "sleep disorder" among Filipino netizens fluctuates greatly and is generally on a downward trend. The search trend for "sleep disorder" among Canadian netizens is moderate, and the overall trend is like that of Filipinos. It is worth noting that the Google Trends for "sleep disorder" among Filipino and Canadian netizens has changed from an overall increase to an overall decrease in 2020 as the watershed. This indicates a temporal correlation between the surge in COVID-19 cases and online search for "sleep disorder". **Conclusion:** It shows that public interest in "sleep disorder" has significantly increased during the COVID-19 pandemic, and there may be a certain correlation between the COVID-19 pandemic and sleep disorders. These are worthy of further exploration by researchers, especially the changes in people's daily routines caused by the COVID-19 pandemic, which in turn affect people's sleep quality.

Key Words: sleep disorder, COVID-19, Google Trends, search engine, public interest

1. Introduction

Previous studies have shown that the COVID-19 pandemic disrupted daily routines, leading to widespread sleep disorders, such as delayed sleep timing and decreased overall sleep quality. Specifically, many individuals adopted later sleep and wake-up times, with an average delay of about one hour in both sleep onset and wake times. Although total sleep duration slightly increased by approximately 0.5 hours, sleep quality significantly declined (Manber, 2020; Partinen et al., 2021; Riva et al., 2021). Stress during the pandemic, lack of structured activities, and increased screen time are considered the primary factors for these changes, resulting in a notable rise in insomnia symptoms and delayed sleep phase disorder (Manber, 2020; Partinen et al., 2021; Riva et al., 2021). These sleep issues have impacted not only physical health but also caused profound negative effects on mental health (Perea-Milla et al., 2021; Morin et al., 2020; Stanton et al., 2020).

The COVID-19 pandemic, as a significant emotional stressor, has led to increased levels of depression, anxiety, and other emotions among the general population, further contributing to declines in sleep quality (He, Gao, & Gao, 2020; Jarrin, Chen, Ivers, & Morin, 2014). In addition, certain preventive measures implemented by some countries have restricted people's freedom of movement, weakened social timing cues, and subsequently increased the risk of insomnia among the public (Bo, Li, Yang, & Zhang, 2020). These circumstances likely contributed to the heightened public interest in searching for "sleep disorder". To better explain the patterns in public interest regarding information on "sleep disorder" during the COVID-19 pandemic, this study uses Google Trends to analyze changes in search interest on "sleep disorder" among internet users in the United States, Australia, and Canada from December 2019 to December 2022.

2. Methods

This study used Google Trends (<https://google.com/trends>) to analyze Google search data from December 1, 2019 to December 1, 2022, comparing the search interest in "sleep

disorder" among internet users in different countries. Specifically, this study examines variations in search interest related to "sleep disorder" among users in the United States, the Philippines, and Canada during the pre-pandemic, peak, and post-pandemic phases of the COVID-19 outbreak. Additionally, using the reported search volume for the term "sleep disorder" as a Relative Search Volume (RSV), defined as the percentage of peak search interest observed over a specific period, data comparisons were conducted across the three countries. It is essential to note that the figures do not represent absolute search volumes; instead, they reflect standardized values ranging from 0 to 100 within the scope of this study.

3. Results

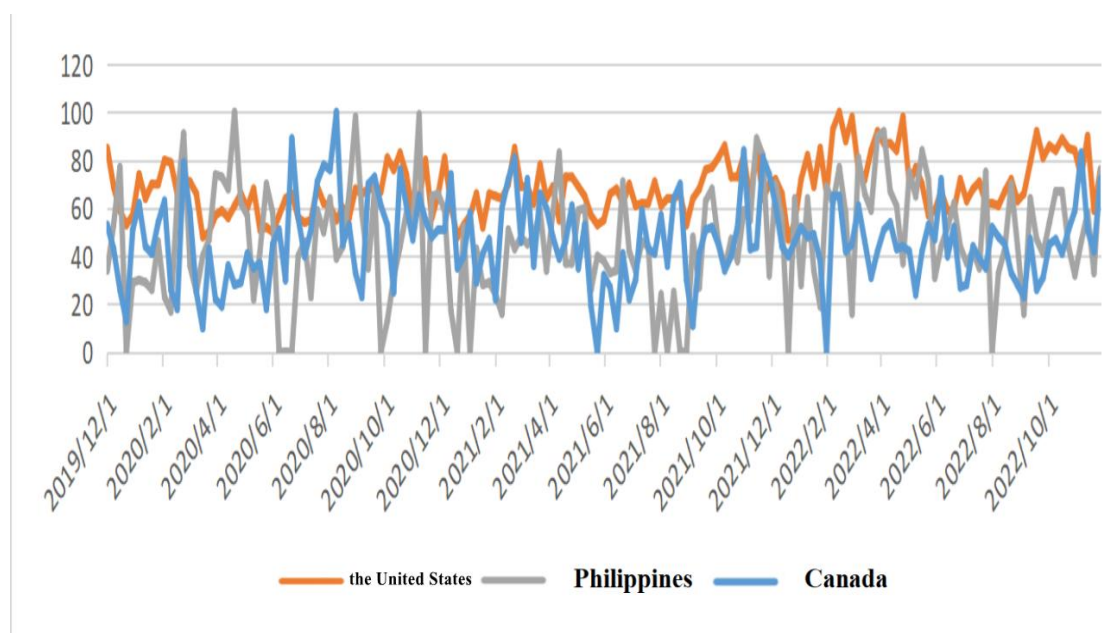


Figure 1.

Google Trends for search term for "Sleep Disorder" in the United States, the Philippines, and Canada during the COVID-19 Pandemic

As shown in Figure 1, public interest in internet searches for "sleep disorder" increased significantly during the COVID-19 pandemic. Google Trends analysis revealed that the rise in search trends was most prominent in Canada, followed by the Philippines and the United States. The study also found a surge in the search trend for "sleep disorder" among Canadian users in late August 2020, reaching the peak for the period under study. In the Philippines,

search trends fluctuated considerably over the three years, peaking in April, September, and December of 2020. Notably, search trends among American users showed an overall upward trajectory, with peaks from February to May of 2022, suggesting a significant association between the rise in COVID-19 cases and online searches for "sleep disorder". As the previous study highlights the severe Omicron wave in January and February 2022, marking the peak of hospitalizations and nearly the highest weekly deaths recorded in the pandemic (Johns Hopkins Coronavirus Resource Center, 2022). It is also noted that by late May 2022, COVID-19 cases were on a downward trend worldwide, including in the U.S., following the Omicron-driven surge from earlier in the year (WHO, 2022).

4. Discussion

This study is the first to utilize Google Trends as a research tool to analyze the public's search behaviors and interest in "sleep disorder" during the COVID-19 pandemic. The findings reveal a significant rise in search trends for "sleep disorder" in Canada and the Philippines in February 2020, with peak levels reached in August 2020 and April 2020, respectively. In contrast, the trend in the United States reached its peak at the end of March 2022, with notable surges in January and mid-December 2020. The study indicates that spikes in searches for "sleep disorder" occurred in all countries during the COVID-19 pandemic, suggesting a significant temporal association between rising COVID-19 cases and online searches for "sleep disorder". Furthermore, the trend in the Philippines and Canada gradually declined after December 2020, reinforcing the temporal link between increased COVID-19 cases and "sleep disorder" search trends. Previous studies have noted the utility of Google Trends in tracking developments related to emerging infectious diseases (Ortiz-Martínez, García-Robledo, Vásquez-Castañeda, & Escobar-Escobar, 2020).

Studies have suggested that major emotional stress events often lead to negative emotional responses (Jarrin, Chen, Ivers, & Morin, 2014). Public interest in searching for "sleep disorder" has shown a noticeable increase. Thus, we can reasonably infer that the outbreak of COVID-19 has disrupted people's daily routines, such as extending sleep hours and decreasing sleep quality. Furthermore, the surge in COVID-19 cases has not only caused physical harm to a growing number of individuals but also increased psychological pressure, leading to negative emotions that may, in turn, trigger symptoms of sleep disorders.

The increase in searches for "sleep disorder" highlights disruptions in daily life and emotional instability during the COVID-19 pandemic—a worrisome trend. Although the World Health Organization recently declared that COVID-19 is no longer a Public Health Emergency of International Concern (Bhushan, 2023), and the situation has generally improved, new infectious variants of the virus continue to emerge, posing ongoing challenges. Since 2023, several new SARS-CoV-2 variants have emerged with potential impacts on transmissibility, immunity, and public health, including JN.1, BA.2.86, and XEC (AAMC, 2023; CDC, 2023; Yale Medicine, 2023; European Centre for Disease Prevention and Control, 2024). The negative physical and mental effects of infectious diseases, including COVID-19, on individuals should not be overlooked (Fardin, 2020). Therefore, it is essential for people to mitigate such adverse reactions through self-regulation techniques.

Furthermore, a pervasive flow of negative information creates an emotionally taxing environment, which can exacerbate sleep-related issues. This effect is especially pronounced when such negative emotions are not effectively managed (Alimoradi et al., 2021; Ingram, Maciejewski, & Hand, 2020), making it even more detrimental to well-being. Therefore, at the national and societal level, strict scrutiny of pandemic-related reporting is necessary to prevent exaggerated portrayals of the crisis that may incite public fear. In addition to factual and objective reporting, positive social messages should be promoted to encourage public resilience. On a personal level, individuals can engage in self-regulation through balanced diets, regular exercise, and limiting exposure to electronic devices to reduce contact with distressing information. These practices could help alleviate symptoms of sleep disorders.

5. Conclusions and Limitations

Overall, public search interest in sleep disorders surged during the COVID-19 pandemic, suggesting a potential link between the pandemic and sleep disruptions, possibly associated with heightened negative emotions. This trend was notably more pronounced in the Philippines and Canada. Although fluctuations in search trends were smaller in the United States, American internet users have consistently shown a high level of interest in "sleep disorder". Google Trends has proven an effective, real-time tool for monitoring public interest in sleep-related issues during the pandemic. This study highlights the pandemic's adverse

effects on sleep and emotional well-being, underscoring the importance of maintaining a balanced lifestyle and engaging in psychological self-care during public health crises.

Although Google is the largest search engine globally, Google Trends data only reflects the behavior of Google users and may not fully represent the perspectives of the broader public. The analysis relies exclusively on data from the Google search platform, without incorporating data from other widely used search engines, such as Baidu, which is particularly popular in China. This limitation may restrict the generalizability of findings to regions or populations that primarily utilize other platforms. Additionally, the study does not explore potential mediating factors between "COVID-19" and "sleep disorder", which could introduce bias into the findings. Nevertheless, the study effectively highlights shifts in public interest in "sleep disorder" during the COVID-19 pandemic, offering a valuable analytical perspective for future research in this area. Future studies could delve into the following questions: Did reduced access to in-person medical consultations lead more individuals to seek health information online during the COVID-19 pandemic? Could excessive focus on sleep disorders during the COVID-19 pandemic lead to an increase in sleep issues, such as “sleep anxiety” or “sleep effort”? Addressing these questions would provide a more comprehensive understanding of the pandemic’s impact on public mental health.

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