Public interests in mental health topics in COVID-19: evidence from Wikipedia searches

Kaśmir Ciechanowski[a], Dariusz Jemielniak[a,b] and Andrzej Silczuk[c]

[a]MINDS (Management in Networked and Digital Societies) dept. Kozminski University, Warsaw, Poland; [b]Berkman-Klein Center for Internet and Society, Harvard University, Cambridge, MA, USA; [c]Public Health Department, Medical University of Warsaw, Warsaw, Poland

ABSTRACT
Objective: The aim of the study was to explore community interest in mental health topics during and before the COVID-19 pandemic. **Method:** We gathered and analysed a large dataset (over 3 billion) of views of 1763 English Wikipedia mental health articles, and their counterparts in nine other language versions of Wikipedia, between the period of January 1, 2016, and December 31, 2020. **Results:** The results of this study show that the patterns of Wikipedia searches during the pandemic changed. Interest in articles about insecurities and paraphilias increased. There were more searches for child abuse-related topics. Views for depression decreased. **Discussion:** We hypothesise that during the lockdown and enforced video communication, people's concern about self-image and privacy arose, and the tendency to follow one's desires online increased. There may be a possible interaction between media coverage and the novelty with the saturation of a given concept in the public discourse. The observations on the online interests of peers may become a sensitive predictor and early sign of arising new phenomena and increase of ongoing public health problems. The results of this study and future in-depth research may contribute to providing preventive programs including screening digital tools, and online apps for early intervention.

1. Introduction

The Internet has become the leading source of academic knowledge for most people in developed countries (Brossard & Scheufele, 2013; Kibirige & DePalo, 2017). Seeking health information online is ubiquitous (Boot & Meijman, 2010; Rowlands et al., 2015), including information on psychology and mental health (Colditz et al., 2018; Fergie et al., 2016). Very often, Wikipedia is the first choice of sources (Netimperative, 2019). The scientific communities still treat Wikipedia with some distrust (Aibar et al., 2015; Jemielniak, 2019; Jemielniak & Aibar, 2016). Admittedly, quality standards of Wikipedia articles differ largely between different languages, as each language edition of Wikipedia is run independently by its local community (Jemielniak & Wilamowski,

2017). However, the overall accuracy and quality are considered to be high (Mesgari et al., 2015), and it is consistently on par with professional sources (Chesney, 2006; James, 2016; Michelucci & Dickinson, 2016), often having a section of cited references. Psychological topics have been well covered in Wikipedia for many years (Schweitzer, 2008), and in narrow topical comparisons to psychiatry textbooks or professional encyclopedias, Wikipedia fares at least equal to them in terms of content quality (Reavley et al., 2012). Professional psychological associations such as the American Psychological Association (APA) and the American Physical Society (APS) actively encourage academic psychologists to participate in developing Wikipedia (Banaji, 2011; Breckler, 2010). English Wikipedia is more widely used than the websites of the National Health Service (NHS) and the National Institutes of Health (NIH) for medical information (Heilman & West, 2015).

Irrespective of discussions about Wikipedia's accuracy, it is the most popular text-based knowledge repository, with five billion monthly visits, and has been ranked as the fifth most popular website in the world, behind Google, YouTube, Facebook, and Baidu (Armstrong, 2019). Unlike these websites, Wikipedia is a large-scale collaborative non-profit project, relying on crowdsourced knowledge dissemination (Reagle, 2010; Uhlmann et al., 2019). It is an encyclopedia that anyone can edit, and that is almost entirely self-governed by participants (Jemielniak, 2016; Konieczny, 2017) and the forces of social control and cooperation can lead to constructive results.

As a website developed collectively by an open-knowledge community, closely connected to an open-source ideology of radical transparency and open sharing (Jemielniak & Przegalińska, 2020), much data about its use are publicly available. Hence, Wikipedia's viewership may become a uniquely valuable research object as it allows analysing the general population's interests in knowledge about specific topics. Such data allows us to research on the change in the interests in mental health topics during the recent pandemic. The automatisation of infodemiology data in near real time, can provide insights into health-seeking behaviour and behaviour change attempts (Eysenbach, 2009) providing potentially useful information about mental health (Alibudbud, 2023) for policy makers. To illustrate, a study analysing Google trends and Wikipedia traffic across 37 countries highlighted the need to ensure information disseminated to the public regarding substance use disorder is appropriate, up-to-date, and actively combats misinformation. This urgency arises due to the increasing reliance on the internet for accessing substance use disorder-related information (Alibudbud & Cleofas, 2023).

To date, researchers have established that using Google Trends may be a good predictor of disease outbreaks, and general behavioural patterns (Heerfordt & Heerfordt, 2020; Nuti et al., 2014), as well as mental health and psychological well-being, also during the pandemic (Hoerger et al., 2020; Zattoni et al., 2020). Wikipedia searches may be a useful addition to these studies, as they reflect the changing interests in encyclopedic coverage of the searched topics in general, which may be a better proxy of an inquiry deeper than a Google search. While there have been analyses of Wikipedia searches during COVID-19 lockdowns in topics related to medicine (Chrzanowski et al., 2021), the changes in views of articles related to psychology in Wikipedia have not been systematically studied.

Statistics of online searches have become a well-established method of studying the general public's interest and mental health, before the pandemic. For instance, in a study in Ontario, Canada of mental health queries in Google Trends it was shown that

such queries behave in a seasonal manner (the terms 'schizophrenia,' 'autism,' 'bipolar,' 'depression,' 'anxiety,' 'OCD,' and 'suicide' were analysed in the years 2012-2017) (Soreni et al., 2019). They found that in winter there is more interest in these topics and in summer there is a decrease (besides 'suicide'). Conversely, in case of brain tumour queries on Google and Wikipedia study, no noticeable patterns could be found that could link to the increasing global incidence of brain tumours (Mondia et al., 2022).

There are also studies that describe mental disorders during the pandemic by analysing online search patterns. In some, it was shown that the prevalence of depression, anxiety, and stress among university students increased two – or threefold in that time (Al Mamun et al., 2021). In healthcare workers, there was an observed increase in depression, anxiety, and insomnia (Rossi et al., 2020). Search patterns for stress-related terms in 11 Latin American countries changed during the pandemic (Silverio-Murillo et al., 2021). Other articles describe the influence of the pandemic on Google Trends queries about mental health (Hoerger et al., 2020; Knipe et al., 2020), or 'insomnia' (Zitting et al., 2021). Another attempt to ascertain the impact of the pandemic on the mental health of internet users based on viewership on Google Trends and social media (Gianfredi et al., 2021).

Notwithstanding such research, Google Trends alone may not be a good indicator of mental health wellbeing (Knipe et al., 2021). Studying Wikipedia offers a distinct advantage by providing a more granular focus on topics of genuine interest. Wikipedia viewership reflects the engagement of individuals who actively seek to read beyond casual searching. This observation was supported by a comprehensive study conducted on 14 language versions of Wikipedia (Lemmerich et al., 2019). The study identified the desire to acquire in-depth knowledge as one of the most significant reasons for people choosing to read Wikipedia (Lemmerich et al., 2019).

Different types of viewership have been already studied, based on Wikipedia searches including diet search trends in Italy before and after the pandemic (Nucci et al., 2021), health information (Smith, 2020), and the connection between media coverage of a given topic and their viewership on Wikipedia (Gozzi et al., 2020). There were other studies describing search patterns before the pandemic on Wikipedia connected with health (Gabarron et al., 2015; Generous et al., 2014; Laurent & Vickers, 2009; Nuti et al., 2014), the similarities and differences between viewership of the most trending topics in four months in 2018 in three languages (Miz et al., 2020); neurological disorders (Brigo et al., 2015), the monitoring seasonal disease trends in France (Vilain et al., 2017) and another which found a positive correlation between the number of measles infections in Italy and Wikipedia traffic (Provenzano et al., 2019).

The main aim of this study was to analyse changes in Wikipedia views about mental health topics, including paraphilias, during the COVID-19 pandemic.

2. Materials and method

This study leverages the strengths of Big Data search statistics analysis, based on Wikipedia articles specifically related to mental health, and comparing nine different languages with English Wikipedia.

A total number of 1763 articles indexed by WikiProject Psychology, a volunteer-driven list of Wikipedia entries related to psychology, was selected from English

Wikipedia. A total count of views between the period of January 1, 2016 and December 31, 2020, was assessed with the use of Massviews tool (tools.wmflabs.org/massviews/). We queried the pageviews of these articles in bulk, by creating a PagePile with them (essentially a list of articles). Only Wikipedia articles indexed by WikiProject Psychology were analysed. Furthermore, the views of corresponding articles on the same topics in nine other language Wikipedias (German, French, Spanish, Polish, Portuguese, Russian, Swedish, Dutch, and Italian), were checked by relying on 'interwiki' links, connecting the same articles in different languages (with the same procedure as for English articles' list followed). The choice of languages was determined as these are the most popular Wikipedias in the world, according to wikistics.org, and among the ones with the largest number of edits.

The authors initially examined the articles that experienced the highest fluctuations in viewership during the pandemic. They employed an iterative clustering approach to gain a comprehensive understanding of the overall changes that occurred. Consequently, they compiled a collection of 60 articles with the most substantial increase in interest and another 60 with the most significant decrease. While the categorisation is not definitive, the authors aimed to establish a level of objectivity, ensuring that other teams analysing the data might arrive at similar groups of articles. Selective articles are discussed in detail to highlight trends and fluctuations of interest.

For analysis and graph presentation, Python 3.7.6 was used. In two samples Wilcoxon rank-sum was used, which is a function in SciPy, to obtain the W score in Python and the α was set to .05. The period of the pandemic lockdown was considered as the time after March 2020 until the end of the year. The pre-pandemic period to compare the pandemic with was from January 2016 to the end of February 2020. The decision to use the Wilcoxon test, which is a non-parametric, robust against violations of normality assumptions test, was dictated by the unusual distribution of data. Two unequal groups were compared, so authors decided to compare not sums of the two periods, but the number of visits each day separately to get the information if the views increased or decreased. For each result, the effect size was calculated using the conventional equation $r = Z / sqrt(n)$ (Tomczak & Tomczak, 2014). This provides a standardised way to quantify the size of an effect or the degree of association between variables. The effect size r ranges from −1 to 1, where values close to −1 indicate a large negative effect, values close to 0 indicate no effect, and values close to 1 indicate a large positive effect.

For the graphs with all languages together, the number of views was standardised, so that they present how many standard deviations from the mean they fluctuate. It should be noted that the internet traffic has increased during the pandemic as a whole, and to check how much it affected all Wikipedia pages in general (not only connected with mental health topics), the data about all visits to Wikipedia website from January 2016 to the end of 2020 were analysed (see Figure 1) with Wilcoxon's test, and the result is that the traffic on Wikipedia in general also increased during the pandemic, with the W score equal to −4.48.

3. Results

The results of the analyses are presented in the tables in the Appendix (see Table A1 and Table A2). The articles selected for more detailed analysis are presented in Table A3 in
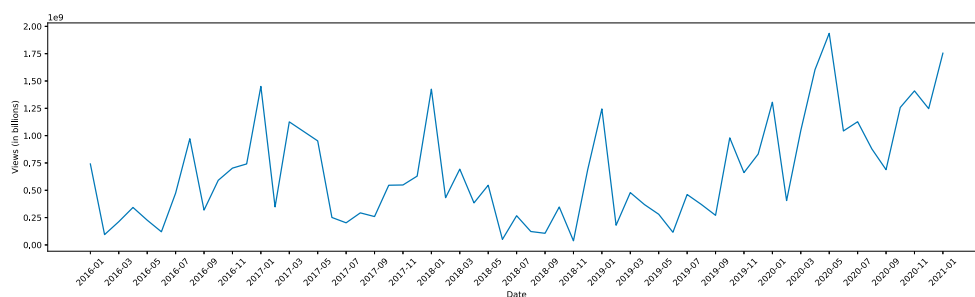
Figure 1. Changes in views to English Wikipedia overall 2016-2021.

the Appendix; there are English articles and their counterparts in the nine languages (if the Wikipedia entry exists in that language) with absolute sums of views before and during the pandemic, absolute total sums of views, daily mean and standard deviation before and during the pandemic, W stat of the Wilcoxon test, p value, effect size, and effect magnitude.

The article on 'Body dysmorphic disorder' experienced a notable surge in interest during the pandemic (see Figure 2), ranking 28th in terms of increased attention. The W score for this article in English Wikipedia was recorded at −21.69, effect size 0.53. While the disorder had experienced sporadic peaks in previous years, its popularity steadily rose in 2020, reaching significantly higher levels compared to 2016–2019. During the pandemic, the lowest weekly view count occurred in early November with 15,500 views, while the highest was recorded at the beginning of July with 28,000 views per week. A shift in viewing trends can be observed in 2020, starting from mid-March. This period saw an increase in weekly views from 14,000 to 20,000, whereas in previous years, views had been declining during the same period. Prior to 2020, views typically fluctuated between 10,000 and 13,000, occasionally experiencing notable peaks. Among the languages analysed, German, Italian, Dutch, Polish, Portuguese, and Russian views showed an increase in views (with W scores of −3.46, −23.14, −2.25, −27.66, −2.43, and −22.10, effect size 0.08, 0.56, 0.05, 0.67, 0.06, 0.54, respectively). However, views in Spanish (W = 17.17, effect size 0.42) and Swedish (W = 24.95, effect size 0.60) experienced a decrease. Regardless of a significant decline in interest in Spanish and Swedish, both languages showed an increase in views in mid-March 2020. The magnitude of this increase varied among languages, with Portuguese and Swedish experiencing a modest
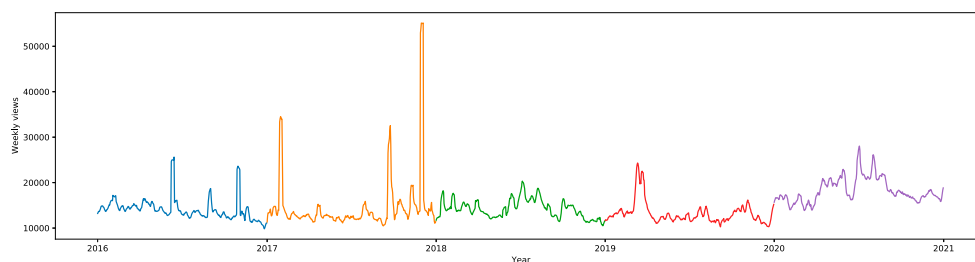
Figure 2. 2016–2021 views of 'Body dysmorphic disorder' article on English Wikipedia.

rise, while Italian views saw nearly a five-fold surge. In other languages, the increase hovered around 50% compared to the beginning of 2020.

The article 'Coprophilia' was found in the first 20 entries with the highest increase of interest in the pandemic (see Figure 3), with a W score equal to −23.78 and effect size 0.58. Some peaks of interest were also noted in the previous years. Besides these peaks, views stayed at a level of less than 10,000 a week, whereas during the pandemic, it rose to 12,000–14,000. In the pandemic, the popularity of 'Coprophilia' did not leap right away, although it started to build up slowly in the middle of March 2020. The first rise is in the first part of April, to 13,000 views (although the same level of interest was also in the middle of February). Then, it continued to grow to almost 22,000 views a week in May (the same peak was at the end of November). In other languages, the situation was not clear-cut. There was a drop in German, French, Italian, and Swedish views, and the W scores are 5.8, 13.12, 3.8, and 4.51, and effect size 0.14, 0.32, 0.09, and 0.11 respectively. In Polish and Russian, there was an increase in views (the W score is −6.97 and −14.11 and effect size 0.17 and 0.34). In Spanish, Dutch, and Portuguese the difference was not statistically significant ($p = 0.74$, 0.2, and 0.55, respectively). However, a similar trend to that in English can be seen in all the languages with significant differences. The French data is completely different and from the beginning of 2020 views fall steadily. In the middle of March 2020, there was a dip in interest, followed by an increase, which was sometimes quite steep. Compared to the average level from before the dip, in German views, there is an increase of views from 650 to 800 a week; this decreased to 600 in May. In French, there were 550 views a week which rose to 900, slowly decreasing back to 550 in the middle of June. In Polish there were 1600 views a week, which rose to 2000 and stayed at that level until December, with a peak in May and at the end of June to 4000, and at the end of December to 6000 views a week. In Russian, interest grew from 5500 to 6000–7000 views a week with several peaks to 7500 (the middle of March, beginning of April), 8000 (the middle of May, beginning of October), and more than 9000 views a week (the beginning of June, the end of August); there are also two drops in September, to 5500 and 5000 views a week. Swedish views appear to follow a similar pattern, but the peaks are later than Russian views. There was no visible change in viewership at the beginning of the pandemic, and it is even lower than at the beginning of the year, but in May, there is a rise to almost 500 views a week (compared to 200–350 views before) and stayed at that level for a
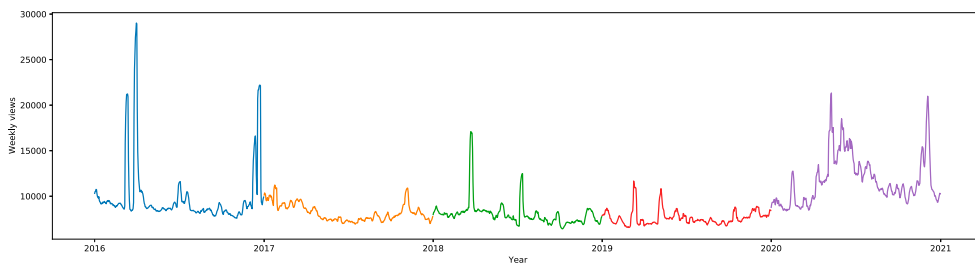
Figure 3. 2016-2021 views of 'Coprophilia' article on English Wikipedia.

month, then it gradually declined to 300 views at the end of the year, with three peaks: at the end of July (370 views a week), the middle of October (450 views a week), and the beginning of December (500 views a week).

Views for 'Major depressive disorder' were less popular in the pandemic than before (see Figure 4). In English, the W score was equal to 25.42 and effect size 0.6. Similar behaviours were recorded every year. At the beginning of each year, there is high interest (around 30,000 searches a week), then there is a decrease in spring and the lowest level in summer (depending on the year between 20,000 and 24,000 views a week). The views start to grow every September and reach another peak in November (similar to the one at the beginning of the year). The lowest dip each year was recorded in December. The graph in 2020 looks significantly different. Only the beginning resembles previous years (except the dip in the middle of March). Later, there is an unusual spike in the middle of June (to 26,000 views a week). After the spike, the graph remains almost flat with around 18,000 searches a week. In German, Spanish, Italian, Dutch, Polish, Portuguese, and Swedish, there was a significant decrease in searches, with the W score equal to 25.4, 19.67, 19.83, 13.29, 9.98, 6.95, and 22.07, and effect sizes 0.62, 0.48, 0.48, 0.29, 0.24, 0.17, and 0.53 respectively. Only in French and Russian was there an increase in views, with the W score equal to −10.35 and −12.98 and effect sizes 0.25 and 0.31, respectively. In Russian, the increase does not change the trend, and trends during the pandemic look similar to previous years, only with more views. However, the French graph has very high peaks in 2020, the first in the middle of March and the second in August, both of which do not correspond to data from previous years. When checking articles in the studied database that were also connected with depression, we found that they were less popular in the majority of languages during the pandemic (see Table A3 in the Appendix). These included 'Antidepressant' (W = 25.03 in English, and dropped in six of eight other languages), 'Atypical depression' (W = 17.16 in English and dropped in two of four other languages), 'Psychotic depression' (W = 17.22 in English and dropped in all three other languages), 'Depressive personality disorder' (W = 9.2 in English, but rose in other languages), 'Mixed anxiety-depressive disorder' (W = 25.21 in English), 'Endogenous depression' (W = 6.77 in English, but rose in Russian), 'Major depression' (W = 19.79 in English), 'Depressive Disorder Not Otherwise Specified' (W = 18.75 in English and dropped in both other languages), 'Unipolar depression' (W = 23.55 in English, and dropped in seven of nine other languages).
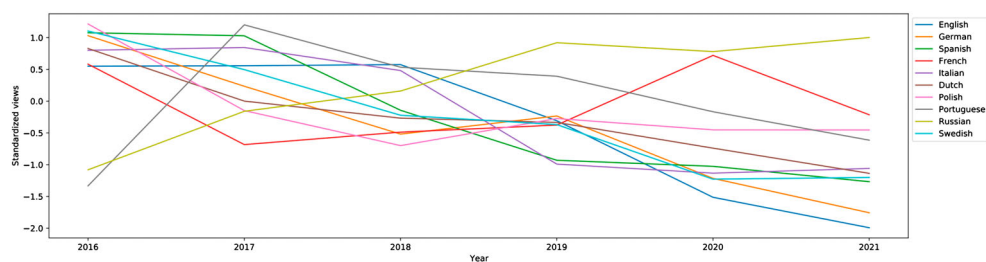
Figure 4. 2016–2021 views of 'Major depressive disorder' article on 10 Wikipedias.

4. Discussion

The aim of the research was to explore community interest in mental health topics during the COVID-19 pandemic. The main finding of this study was that while some topics became significantly more popular, interest in others decreased. The popularity trajectories of the chosen articles were demonstrated.

Searches in Wikipedia may be seen as a reflection of the social discourse. Namely, terms that enter the social discourse and are not well understood by the general public may be sought more often, whereas terms such as depression, even if discussed frequently in media during the pandemic, were not the object of searches possibly because the public was familiar with that topic. Depression in the English-speaking context is a well-known scientific term (a search for the keyword 'depression' on PubMed yielded 142,396 articles between 1978 and 2000 and 427,549 articles between 2001 and 2023), though such research is not always available to the public. Previous research suggests that individuals often struggle to recognise depression symptoms. For example, in a 1997 study of a representative sample of the Australian population, vignettes of a person experiencing major depression were presented to participants. Although most recognised that there was a mental health issue, only 39% correctly labelled the condition as depression (Jorm et al., 1997). In related studies among young Australians in 2006, accurate identifications were under 50% (Burns & Rapee, 2006; Cotton et al., 2006). A study of adult Canadians found that 76% correctly recognised depression (Wang et al., 2007). In a more recent study of Canada's general population, the correct identification of depression was approximately 80%, with no age-related differences (Marcus & Westra, 2012). Researchers studying the US population concluded that mental health literacy is poor and has remained poor even throughout the pandemic (Tambling et al., 2023). Online searches are often perceived as proxies for population interests and predictors of people's behaviours (Choi & Varian, 2012). Moreover, internet search trends are often used as a tool for disease surveillance (Bragazzi, 2013). Although it cannot be claimed that Wikipedia searches may serve as an indicator or the predictor of mental health issues in the society, it may be assumed that they do reflect, at least to a certain degree, the trajectory of the interest in a given topic (Lemmerich et al., 2019).

During the pandemic, the patterns of English Wikipedia searches changed, especially for entries connected with certain disorders. The articles found might be categorised into three groups:

- appearance perception disorders,
- paraphilias,
- depression.

One of the possible explanations for the increased interest in the article 'Body dismophic disorder' may be the mandatory use of cameras during online classes. A, study of university students in the United States of America (USA) found that mandating camera use may trigger anxiety in students, highlighting a possible relationship between the use of cameras and increased self-awareness, with implications for individuals' psychological well-being (Castelli & Sarvary, 2021). Students in many universities and schools were required (Ortiz-Vilarelle, 2022), or strongly encouraged (Castelli &

Sarvary, 2021) to use the cameras during classes. However, some students did not want to turn on their cameras because they were afraid of being exposed, or because they were shy, or they did not want their privacy to be invaded (Gherheş et al., 2021). Typically, in the majority of video conferencing platforms, the default setting forces users to see their own video feed during calls. An option to conceal one's own view, while remaining visible to others, was introduced into video conferencing platforms such as Google Meet (Citron, 2021), Microsoft Teams (Mehta, 2022), and Zoom (*See or Hide My Video*, 2022) relatively late in the pandemic. This means that each participant had to observe their own image alongside others', potentially leading to self-comparisons. Interestingly, there has been a rise in individuals seeking cosmetic surgeries, attributing their decision to their appearance on platforms like Zoom, with presenting concerns such as acne and wrinkles (Rice et al., 2020). Perhaps as many students and people worked remotely, the time spent watching one's self-image increased significantly as a result of the lockdown. The same situation may have occurred at workplaces, as many jobs were undertaken remotely using different modes of online communication.

The phenomenon that people were most interested in included unusual forms of sexual interactions as observed at the early stage of the pandemic (KinkD, 2020), a finding which resonates with the data collected here. The paraphilia in the studied database that was largely discussed is 'Coprophilia', defined as feeling sexual pleasure from interacting with faeces (*ICD-10 Version:2019*, n.d.). Another paraphilia, 'Dominance and submission' also had an increased viewership in all the languages (English, Spanish, Italian, and Portuguese, for more details, see Table 3 in the Appendix). This kind of paraphilia may be associated with lockdown settings because, as described in Wikipedia, it does not require physical contact and can be performed via the telephone or internet. Another finding is that the Swedish interest in the article about coprophilia shifted (the peaks are later than in other languages). One possible explanation could be that the Swedish approach to the COVID-19 pandemic and lockdowns was different from the rest of the world, with the first lockdown policy ruled in January 2021 (Regeringskansliet, 2021). Moreover, the overall visits to pornographic websites increased during the pandemic but only in the countries with a 'stay at home' lockdown policy (Zattoni et al., 2020), which may explain not only the shift of the peak in Swedish but also the overall interest in the Wikipedia article 'Coprophilia'. This curiosity may be one of the reasons for searching for pornography as others have found (Paul & Shim, 2008), which could lead to searching for information about different types of pornography.

It is worth noting here that during the pandemic, there was increased interest in the article 'Chronophilia.' Chronophilia is a term used to describe a sexual attraction to individuals within specific age ranges, such as gerontophilia (attraction to older individuals), mesophilia (attraction to middle-aged individuals), and paedophilia (attraction to children). Among these different types of chronophilias, it is important to highlight that only paedophilia is considered a mental disorder (*ICD-10 Version:2019*, n.d.). An increase in views may be attributable to lockdowns serving as an opportunity for paedophiles to entice children. According to NCMEC (National Center for Missing & Exploited Children), there was an increase in online reports of children enticement in the USA between January and September 2020 by 98.66% (compared to the same period in 2019), and CyberTipline reports by 63.31% (O'Donnell, 2020). One explanation

of the increase in the views of the Wikipedia article 'Chronophilia' might be that the victims (or their parents) were searching for more information on what to do in a case of being abused online.

The interest in the 'Major depressive disorder' article decreased significantly in almost all languages. This situation is surprising because during the pandemic the media were filled with negative information about the lockdowns, deaths due to the virus, losing employment, and other negative impacts (Abbott, 2021; Ducharme, 2020; Haseltine, 2021; Sahgal & Connaughton, 2021). Despite the significant increase of 27.6% in the number of people experiencing depression globally due to the COVID-19 pandemic (Santomauro et al., 2021), there was no corresponding rise in the number of Wikipedia views on this topic. This observation suggests that individuals may not have actively sought information on how to seek help or cope with this serious disorder. However, this may also indicate that people did not require further information on depression. The decrease of interest in English Wikipedia can be seen in other languages along with other related depression articles,

This study is limited as there was no way of ascertaining people's intention when looking up a Wikipedia entry. They may be seeking help for themselves, or be driven by curiosity. It is not possible to determine the nationality of people searching for an entry on Wikipedia, especially the English version. Moreover, it is important to note that the pandemic lockdown policies in different countries/regions differed.

This research has several clinical implications. The increased interest in appearance perception disorders indicates a potential rise in such conditions during heightened online interaction, calling for clinician vigilance and preparedness. The search pattern around paraphilias reflects a possible exploration of unconventional sexual interests, requiring clinicians to approach these issues supportively. The rise in views on 'Chronophilia' may highlight increased online exploitation risks, stressing the importance of safeguarding efforts. Despite the global rise in depression during the pandemic, the lack of increased searches for depression suggests a need for improved public education around recognising and seeking help for this condition. Regional differences in mental health impact underscores the importance of culturally sensitive clinical approaches. The findings underscore the relevance of teletherapy in an increasingly digital world. Overall, these patterns suggest evolving mental health needs post-pandemic, and the need for continued research and flexible clinical practice.

5. Conclusions

Our study provides insights into the evolving patterns of public interest in mental health topics during the COVID-19 pandemic, as reflected in Wikipedia search volumes. Despite the reported increase in depression prevalence during this time (Elmer et al., 2020), searches for related articles decreased, potentially due to heightened media coverage fulfilling information needs. Increased searches for certain paraphilias and child abuse-related topics were observed, possibly a reflection of altered behaviours during lockdown. Additionally, this study highlights cultural variations captured by analysing multiple language versions of Wikipedia. Our findings suggest that Wikipedia, rather than general search engines, may offer a precise gauge of detailed public interest in specific topics. Results demonstrate the value of online search trend analysis in

understanding public interest. This study requires further investigation to fully elucidate the dynamics between information-seeking behaviour, media coverage, and mental health prevalence.

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No potential conflict of interest was reported by the authors.

Conflict of interest statement

DJ is a non-paid, voluntary member of the Board of Trustees of Wikimedia Foundation, the non-profit publisher of Wikipedia. Authors declare no other conflict of interest.

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Appendix

Table A1. Top 60 articles in English with the largest increase in viewership

no.	Article	W_stat
1	Neurocognition	−27.96
2	Masking (personality)	−27.87
3	Defence mechanism	−27.87
4	Womb envy	−27.41
5	Host (psychology)	−26.94
6	Symbolic violence	−26.11
7	Neurosyphilis	−25.35
8	Substance intoxication	−24.98
9	Social distance	−24.90
10	Psychological pain	−24.89
11	Comorbidity	−24.85
12	Sylvia Plath effect	−24.57
13	Introjection	−24.18
14	Breathwork	−24.16
15	Logorrhea (psychology)	−24.08
16	Individual psychology	−23.83
17	Inner child	−23.80
18	Coprophilia	−23.78
19	Echopraxia	−23.77
20	Reciprocal liking	−23.50
21	Maladaptive daydreaming	−22.82
22	Superman complex	−22.80
23	International Classification of Diseases	−22.80
24	Logotherapy	−22.51
25	Shadow (psychology)	−22.44
26	Man and His Symbols	−22.20
27	Psychic driving	−21.85
28	Fooled by Randomness	−21.84
29	Body dysmorphic disorder	−21.69
30	Subliminal perception	−21.54
31	Stimming	−21.52
32	Rashomon effect	−21.33
33	Cinderella complex	−21.19
34	Dominance and submission	−21.13
35	Acrophobia	−21.04
36	Reactance (psychology)	−21.02
37	Narcissistic parent	−20.73
38	Righteous indignation	−20.71
39	Silva Method	−20.70
40	Cassandra (metaphor)	−20.19
41	Collective identity	−20.19
42	Chronophilia	−19.98
43	Transvestic fetishism	−19.90
44	Thought insertion	−19.83
45	Infradian rhythm	−19.63
46	Homophobia	−19.59
47	Philomath	−19.53
48	Complex (psychology)	−19.31
49	Thought-terminating cliché	−19.17
50	Apoplexy	−19.04
51	Synesthesia	−18.65
52	Siege mentality	−18.61
53	Suicidal ideation	−18.47
54	Jungian psychology	−18.34
55	Metapsychology	−18.28

(Continued)

Continued.

no.	Article	W_stat
56	Ideas of reference	−18.11
57	Hypnopompic	−18.06
58	Social disruption	−18.04
59	Malignant narcissism	−17.95
60	Machiavellianism scale	−17.37

Table A2. Top 60 articles in English with the largest decrease in viewership

no.	Article	W_stat
1	Sensation (psychology)	27.66
2	Levels-of-processing effect	27.65
3	Coping (psychology)	27.39
4	Impulse control disorder	27.36
5	ESFJ	27.16
6	Sibling	27.06
7	Burnout (psychology)	26.99
8	INFP	26.99
9	Engram	26.92
10	Hyperprosexia	26.86
11	Stir crazy (condition)	26.84
12	Personality tests	26.82
13	Mental function	26.81
14	Value (personal and cultural)	26.81
15	Separation anxiety disorder	26.75
16	Pathological lying	26.75
17	Denial	26.75
18	Narcissistic rage	26.72
19	Persecutory delusions	26.71
20	Classical Adlerian psychology	26.65
21	Research methods	26.64
22	Forgiveness	26.56
23	List of important publications in psychology	26.54
24	Relationship counselling	26.53
25	Adolescence	26.50
26	Anxiety disorder	26.47
27	Habit (psychology)	26.45
28	Memory and aging	26.45
29	Endogeny	26.43
30	Organisational communication	26.40
31	Social psychology (psychology)	26.40
32	Mental calculation	26.37
33	Passive–aggressive behavior	26.37
34	Norm (sociology)	26.31
35	Stress (medicine)	26.29
36	Paranoid personality disorder	26.29
37	Hierarchy of needs	26.27
38	Amnesia	26.14
39	Muenchhausen syndrome	26.09
40	Ego	26.07
41	Keirsey Temperament Sorter	26.06

Continued.

no.	Article	W_stat
42	Classical Adlerian psychotherapy	25.98
43	Mentoring	25.95
44	Learning theory (education)	25.93
45	Intuition (knowledge)	25.91
46	Binge drinking	25.85
47	Dysphoria	25.83
48	Deterrence (psychology)	25.78
49	Artisan temperament	25.74
50	Reasoning	25.74
51	Mathematics disorder	25.72
52	Social anxiety disorder	25.69
53	Euphoria	25.64
54	Psychological repression	25.62
55	Semantic dyslexia	25.57
56	Age regression	25.49
57	Placebo effect	25.46
58	Anorgasmia	25.46
59	Circumstantiality	25.45
60	Major depressive disorder	25.42

Table A3. Detailed statistics of the discussed articles in all languages

	Page name	Language	Absolute sum before pandemic	Absolute sum pandemic	Absolute total sums	Daily mean before pandemic	Daily std before pandemic	Daily mean pandemic	Daily std pandemic	W_stat	p_value	Effect size	Effect magnitude
1	Antidepressant	EN	2,309,308	249,992	2,559,300	1354.43	410.21	801.26	99.61	25.03	0.00	0.61	Large
	Antidepressant	DE	888,686	123,314	1,012,000	521.22	121.47	395.24	54.43	18.24	0.00	0.44	Medium
	Antidepressant	ES	1,108,832	125,445	1,234,277	650.34	264.4	402.07	122.27	22.21	0.00	0.54	Large
	Antidepressant	FR	492,077	91,573	583,650	288.61	183.15	293.5	42.72	−4	0.00	0.1	Small
	Antidepressant	NL	322,613	43,457	366,070	189.22	44.88	139.29	24.09	18.8	0.00	0.46	Medium
	Antidepressant	PL	331,666	54,776	386,442	194.53	51.69	175.56	30.67	5.89	0.00	0.14	Small
	Antidepressant	PT	544,222	73,050	617,272	319.19	116.11	234.13	63.37	12.57	0.00	0.3	Medium
	Antidepressant	RU	1,587,328	325,361	1,912,689	930.98	383.13	1042.82	156.14	−10.29	0.00	0.25	Medium
	Antidepressant	SV	238,360	38,950	277,310	139.8	38.08	124.84	28.46	6.75	0.00	0.16	Small
2	Atypical depression	EN	565,844	74,047	639,891	331.87	1164.48	237.33	31.8	17.16	0.00	0.42	Medium
	Atypical depression	ES	28,443	6,353	34,796	16.68	14.9	20.36	8.06	−3.92	0.00	0.09	Small
	Atypical depression	FR	30,143	5,103	35,246	17.68	6.63	16.36	5.17	2.93	0.00	0.07	Small
	Atypical depression	PT	36,286	5,566	41,852	21.28	11.52	17.84	8.9	6.11	0.00	0.15	Small
	Atypical depression	SV	80,913	24,237	105,150	47.46	21.66	77.68	14.15	−21.61	0.00	0.52	Large
3	Body dysmorphic disorder	EN	3,597,842	837,436	4,435,278	2110.17	1388.78	2684.09	454.37	−21.69	0.00	0.53	Large
	Body dysmorphic disorder	DE	474,739	90,496	565,235	278.44	111	290.05	81.98	−3.46	0.00	0.08	Small
	Body dysmorphic disorder	ES	720,021	85,015	805,036	422.3	318.69	272.48	54.56	17.17	0.00	0.42	Medium
	Body dysmorphic disorder	IT	295,601	84,553	380,154	173.37	147.38	271	83.46	−23.14	0.00	0.56	Large
	Body dysmorphic disorder	NL	100,087	18,829	118,916	58.7	25.37	60.35	25.91	−2.25	0.02	0.05	Small
	Body dysmorphic disorder	PL	12,293	49,729	62,022	7.21	27.59	159.39	44.84	−27.66	0.00	0.67	Large
	Body dysmorphic disorder	PT	130,579	23,548	154,127	76.59	109.56	75.47	22.99	−2.43	0.02	0.06	Small
	Body dysmorphic disorder	RU	744,244	208,138	952,382	436.51	275.81	667.11	202.93	−22.1	0.00	0.54	Large
	Body dysmorphic disorder	SV	196,559	17,728	214,287	115.28	65.26	56.82	41.11	24.95	0.00	0.6	Large

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	Page name	Language	Absolute sum before pandemic	Absolute sum pandemic	Absolute total sums	Daily mean before pandemic	Daily std before pandemic	Daily mean pandemic	Daily std pandemic	W_stat	*p*_value	Effect size	Effect magnitude
4	Chronophilia	EN	391,291	96,969	488,260	229.5	58.81	310.8	80.06	−19.98	0.00	0.48	Medium
	Chronophilia	DE	55,220	13,183	68,403	32.39	11.56	42.25	15.75	−13.98	0.00	0.34	Medium
	Chronophilia	ES	296,509	63,978	360,487	173.91	46.17	205.06	62.7	−7.38	0.00	0.18	Small
	Chronophilia	FR	52,622	10,363	62,985	30.86	13.83	33.21	7.91	−6.88	0.00	0.17	Small
	Chronophilia	PL	38,963	13,747	52,710	22.85	32.71	44.06	13.16	−23.59	0.00	0.57	Large
	Chronophilia	PT	38,886	5,274	44,160	22.81	13.14	16.9	8.65	6.56	0.00	0.16	Small
	Chronophilia	SV	4,679	917	5,596	2.74	2.16	2.94	2.03	−2.19	0.03	0.05	Small
5	Coprophilia	EN	2,088,722	544,018	2,632,740	1225.06	500.15	1743.65	533.87	−23.78	0.00	0.58	Large
	Coprophilia	DE	868,558	156,890	1,025,448	509.42	642.04	502.85	663.65	5.8	0.00	0.14	Small
	Coprophilia	ES	961,121	171,007	1,132,128	563.71	297.36	548.1	191.2	0.33	0.74	0.01	Small
	Coprophilia	FR	563,360	73,748	637,108	330.42	377.4	236.37	86.51	13.12	0.00	0.32	Medium
	Coprophilia	IT	153,145	24,973	178,118	89.82	63.51	80.04	25.11	3.8	0.00	0.09	Small
	Coprophilia	NL	44,166	7,809	51,975	25.9	23.9	25.03	7.01	−1.28	0.2	0.03	Small
	Coprophilia	PL	432,289	84,916	517,205	253.54	244.5	272.17	159.11	−6.97	0.00	0.17	Small
	Coprophilia	PT	149,573	26,887	176,460	87.73	70.15	86.18	51.74	0.6	0.55	0.01	Small
	Coprophilia	RU	1,370,081	279,376	1,649,457	803.57	770.69	895.44	227.86	−14.11	0.00	0.34	Medium
	Coprophilia	SV	82,618	13,696	96,314	48.46	30.92	43.9	14.96	4.51	0.00	0.11	Small
6	Depressive Disorder Not Otherwise Specified	EN	117,377	11,410	128,787	68.84	32.68	36.57	15.4	18.75	0.00	0.45	Medium
	Depressive Disorder Not Otherwise Specified	FR	2,488	335	2,823	1.46	1.49	1.07	1.33	4.75	0.00	0.11	Small
	Depressive Disorder Not Otherwise Specified	NL	15,707	1,698	17,405	9.21	5.07	5.44	3.06	13.33	0.00	0.32	Medium
7	Depressive personality disorder	EN	235,465	37,077	272,542	138.1	34.78	118.84	21.25	9.2	0.00	0.22	Medium
	Depressive personality disorder	PT	7,867	3,252	11,119	4.61	6.43	10.42	5.07	−15.54	0.00	0.38	Medium
	Depressive personality disorder	RU	25,613	19,485	45,098	15.02	19.12	62.45	17.28	−25.72	0.00	0.62	Large

8	Dominance and submission	EN	2,674,102	607,999	3,282,101	1568.39	292.17	1948.71	187.59	−21.13	0.00	0.51	Large
	Dominance and submission	ES	608,145	135,208	743,353	356.68	80.86	433.36	113.65	−13.07	0.00	0.32	Medium
	Dominance and submission	IT	232,556	44,374	276,930	136.4	72.19	142.22	27.97	−5.7	0.00	0.14	Small
	Dominance and submission	PT	260,794	76,790	337,584	152.96	78.43	246.12	107.96	−14.23	0.00	0.34	Medium
9	Endogenous depression	EN	147,343	21,276	168,619	86.42	137.81	68.19	21.2	6.77	0.00	0.16	Small
	Endogenous depression	RU	159,300	104,711	264,011	93.43	75.79	335.61	158.83	−27.05	0.00	0.65	Large
10	Major depression	EN	141,476	17,166	158,642	82.98	87.38	55.02	10.24	19.79	0.00	0.48	Medium
	Major depression	DE	3,381,024	383,706	3,764,730	1983.01	483.38	1229.83	207.23	25.4	0.00	0.62	Large
	Major depression	ES	595,577	65,704	661,281	349.31	126.55	210.59	37.05	19.67	0.00	0.48	Medium
	Major depression	FR	964,983	200,085	1,165,068	565.97	131.15	641.3	127.31	−10.35	0.00	0.25	Medium
	Major depression	IT	1,134,045	152,484	1,286,529	665.13	160.41	488.73	57.23	19.83	0.00	0.48	Medium
	Major depression	NL	340,826	50,563	391,389	199.9	58.7	162.06	27.82	13.29	0.00	0.32	Medium
	Major depression	PL	1,213,553	181,295	1,394,848	711.76	228.14	581.07	111.24	9.98	0.00	0.24	Medium
	Major depression	PT	373,333	56,790	430,123	218.96	172.82	182.02	41.03	6.95	0.00	0.17	Small
	Major depression	RU	645,255	139,459	784,714	378.45	114.66	446.98	78.05	−12.98	0.00	0.31	Medium
	Major depression	SV	239,765	26,898	266,663	140.62	45.22	86.21	19.31	22.07	0.00	0.53	Large
11	Major depressive disorder	EN	6,202,638	832,640	7,035,278	3637.91	563.36	2668.72	322.84	25.42	0.00	0.6	Large
	Major depressive disorder	DE	3,381,024	383,706	3,764,730	1983.01	483.38	1229.83	207.23	25.4	0.00	0.62	Large
	Major depressive disorder	ES	595,577	65,704	661,281	349.31	126.55	210.59	37.05	19.67	0.00	0.48	Medium
	Major depressive disorder	FR	964,983	200,085	1,165,068	565.97	131.15	641.3	127.31	−10.35	0.00	0.25	Medium
	Major depressive disorder	IT	1,134,045	152,484	1,286,529	665.13	160.41	488.73	57.23	19.83	0.00	0.48	Medium
	Major depressive disorder	NL	340,826	50,563	391,389	199.9	58.7	162.06	27.82	13.29	0.00	0.32	Medium
	Major depressive disorder	PL	1,213,553	181,295	1,394,848	711.76	228.14	581.07	111.24	9.98	0.00	0.24	Medium

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	Page name	Language	Absolute sum before pandemic	Absolute sum pandemic	Absolute total sums	Daily mean before pandemic	Daily std before pandemic	Daily mean pandemic	Daily std pandemic	W_stat	p_value	Effect size	Effect magnitude
	Major depressive disorder	PT	373,333	56,790	430,123	218.96	172.82	182.02	41.03	6.95	0.00	0.17	Small
	Major depressive disorder	RU	645,255	139,459	784,714	378.45	114.66	446.98	78.05	−12.98	0.00	0.31	Medium
	Major depressive disorder	SV	239,765	26,898	266,663	140.62	45.22	86.21	19.31	22.07	0.00	0.53	Large
12	Mixed anxiety-depressive disorder	EN	249,221	3,945	253,166	146.17	112.29	12.64	4.46	25.21	0.00	0.61	Large
13	Pedophilia	EN	5,048,789	1,222,917	6,271,706	2961.17	663.99	3919.61	1248.36	−16.6	0.00	0.4	Medium
	Pedophilia	DE	933,670	235,301	1,168,971	547.61	157.86	754.17	286.25	−17.92	0.00	0.43	Medium
	Pedophilia	ES	3,177,810	688,771	3,866,581	1863.82	601.96	2207.6	1285.49	−4.32	0.00	0.1	Small
	Pedophilia	FR	841,605	195,250	1,036,855	493.61	156.89	625.8	251.05	−16.32	0.00	0.4	Medium
	Pedophilia	IT	606,274	120,752	727,026	355.59	130.08	387.03	99.65	−6.93	0.00	0.17	Small
	Pedophilia	NL	276,245	64,349	340,594	162.02	65.16	206.25	77.2	−13.21	0.00	0.32	Medium
	Pedophilia	PL	549,703	133,220	682,923	322.41	343.84	426.99	209.95	−14.54	0.00	0.35	Medium
	Pedophilia	PT	298,185	52,239	350,424	174.89	82.54	167.43	227.17	9.75	0.00	0.24	Medium
	Pedophilia	RU	1,364,653	298,480	1,663,133	800.38	194.89	956.67	186.42	−14.9	0.00	0.36	Medium
	Pedophilia	SV	148,113	32,589	180,702	86.87	38.22	104.45	50.19	−7.37	0.00	0.18	Small
14	Psychotic depression	EN	535,235	76,953	612,188	313.92	70.28	246.64	37.02	17.22	0.00	0.42	Medium
	Psychotic depression	ES	118,361	14,786	133,147	69.42	26.92	47.39	13.7	15.72	0.00	0.38	Medium
	Psychotic depression	PT	84,711	13,412	98,123	49.68	19.71	42.99	10.06	7.16	0.00	0.17	Small
	Psychotic depression	SV	44,650	7,367	52,017	26.19	8.3	23.61	6.3	4.79	0.00	0.12	Small
15	Unipolar depression	EN	100,899	9,855	110,754	59.18	21.45	31.59	7.51	23.55	0.00	0.57	Large
	Unipolar depression	DE	3,381,024	383,706	3,764,730	1983.01	483.38	1229.83	207.23	25.4	0.00	0.62	Large
	Unipolar depression	ES	595,577	65,704	661,281	349.31	126.55	210.59	37.05	19.67	0.00	0.48	Medium
	Unipolar depression	FR	964,983	200,085	1,165,068	565.97	131.15	641.3	127.31	−10.35	0.00	0.25	Medium
	Unipolar depression	IT	1,134,045	152,484	1,286,529	665.13	160.41	488.73	57.23	19.83	0.00	0.48	Medium
	Unipolar depression	NL	340,826	50,563	391,389	199.9	58.7	162.06	27.82	13.29	0.00	0.32	Medium
	Unipolar depression	PL	1,213,553	181,295	1,394,848	711.76	228.14	581.07	111.24	9.98	0.00	0.24	Medium
	Unipolar depression	PT	373,333	56,790	430,123	218.96	172.82	182.02	41.03	6.95	0.00	0.17	Small
	Unipolar depression	RU	645,255	139,459	784,714	378.45	114.66	446.98	78.05	−12.98	0.00	0.31	Medium
	Unipolar depression	SV	239,765	26,898	266,663	140.62	45.22	86.21	19.31	22.07	0.00	0.53	Large