



ORIGINAL ARTICLE

Altmetric analysis of research on sleep quality disorders published in 2021

Análisis altmétrico de la investigación sobre trastornos en la calidad de sueño publicada en 2021

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ABSTRACT

Introduction: sleep is a biological function of vital importance for most living beings. The number of published research articles related to sleep disturbances and sleep-wake rhythm is unprecedented and shows the intense efforts of the global research community to understand the different aspects of these pathologies and address them.

Objective: to analyze the impact of research on sleep quality disorders published in 2021, based on the media, social and scientific attention received.

Methods: an altmetric, observational, descriptive-retrospective and cross-sectional study was carried out, since the impact and use of research on effects on sleep quality published in 2021 on social and scientific platforms was analyzed through the use of altmetric indicators.

Results: of the 60 articles with the greatest altmetric attention, 50 were publications in journals, nine in preprint servers, and one monograph. Most of the online attention the posts received was on Twitter (1,685,152 total tweets). The journals that published the most influential articles related to the topic in question are classified in SJR Q3 with relatively high H indices.

Conclusions: the research related to Sleep Quality Disorders that most predominated in this study were those published in scientific journals, with the most influential being those published in quartile three journals. Most of the online attention received by these publications It was done on Twitter.

Keywords: Altmetry; Social Media; Sleep Disorders; Visibility; Impact.

RESUMEN

Introducción: el sueño constituye una función biológica de vital importancia para la mayoría de los seres vivos. La cantidad de artículos de investigación publicados relacionados con las alteraciones del sueño y el ritmo sueño-vigilia, no tiene precedentes y muestra los intensos esfuerzos de la comunidad investigadora mundial para comprender los diferentes aspectos de estas patologías y abordarla.

Objetivo: analizar el impacto de la investigación sobre trastornos en la calidad del sueño publicada en el año 2021, a partir de la atención mediática, social y científica recibida.

Métodos: se realizó un estudio altmétrico, observacional de tipo descriptivo-retrospectivo y de corte transversal, pues se analizó el impacto y uso de investigación sobre afectaciones en la calidad de sueño publicada en 2021 en las plataformas sociales y científicas mediante el empleo de indicadores altmétricos.

Resultados: de los 60 artículos con mayor atención altmétrica, 50 fueron publicaciones en revistas, nueve en servidores de preprint y una monografía. La mayor parte de la atención en línea que recibieron las publicaciones se realizó en Twitter (1,685,152 tweets en total). Las revistas que publicaron los artículos más influyentes relacionados con la temática en cuestión se encuentran clasificadas en el Q3 de SJR con índices H relativamente altos.

Conclusiones: las investigaciones relacionadas con los Trastornos en la Calidad del Sueño que más predominaron en este estudio fueron aquellas publicadas en revistas científicas, siendo los más influyentes aquellos publicados en revistas de cuartil tres. La mayor parte de la atención en línea que recibieron estas publicaciones se realizó en Twitter.

Palabras clave: Altimetría; Redes Sociales; Trastornos Del Sueño; Visibilidad; Impacto.

INTRODUCTION

Sleep is a biological function of vital importance for most living beings. Studies on its physiology have shown that a diversity of biological processes of great significance take place during it, such as energy conservation, memory consolidation, metabolic regulation, elimination of waste substances, activation of the system immune, etc.⁽¹⁾

Parallel to the study of sleep physiology, in the clinical sector, a little more is known every day in relation to sleep disturbances or disorders (SD), their frequency, production mechanisms and, even more importantly, the consequences of said SD on the health of the human being, both in the short and long term.⁽¹⁾

In this sense, most of the studies suggest that there is a global increase in the frequency of the different SDs, perhaps because more attention is paid to them and therefore more are diagnosed, or perhaps it could be the result of a true increase in its incidence, influenced by the current pace of life, which in no way privileges or respects the hours dedicated to this physiological activity;⁽²⁾ such reasons have provided a notable increase in scientific production on this subject at an international level.

Consequently, the number of research articles published in such a short period of time related to sleep disturbances and sleep-wake rhythm is unprecedented and shows the intense efforts of the global research community to understand the different aspects of these disorders pathologies and address them. It is important that insights from influential research and innovation in this branch of neuroscience are collected for health strategy makers, researchers in interdisciplinary areas, and society at large. A useful method would be the online trends⁽³⁾ that encompass everything related to sleep quality disorders and that would indicate to some extent the key problems that are influencing today's society.

The increasing rise of social networking websites like Twitter, Facebook, etc. it provides researchers with dissimilar platforms to share their academic publications and thus offers a greater reach of them; element of great significance with respect to the analysis of the impact of scientific research, taking into consideration that scientific activity must manifest its capacity to impact society and have repercussions in its different dimensions.⁽⁴⁾

Alternative metrics (altmetrics) make it possible to track and capture the online impact of scholarly research and thus indicate the articles that are influencing the research community.⁽⁵⁾

Altmetrics make it possible to measure influence and transcend scholarly output on the Web through peer review counts, influential news sites, YouTube videos, blog posts, bookmarks from reference managers such as Mendeley, citations. from Wikipedia and those significant mentions on social networks such as Twitter and Facebook.⁽⁶⁾ In this order of ideas, exploring the altmetric data on research related to sleep quality disorders would make it possible to understand how academic research is intervening in the understanding about this group of diseases, and how this work affects policies around the world. Consequently, altmetric analyzes represent a great opportunity to better understand how, what and who consumes the scientific literature that is produced. For this reason, the authors of this research proposed the objective of analyzing the impact of research on sleep quality disorders published in 2021, based on the media, social and scientific attention received.

METHODS

An altmetric, observational, descriptive-retrospective and cross-sectional study was carried out. The impact and use of research related to the effects on sleep quality published in 2021 on virtual social and scientific platforms was analyzed through the use of altmetric indicators.

The data used in the study in question were obtained from the Dimensions database (<https://www.dimensions.ai/>), a research information web platform that collects relevant information on funding, scientific results, patents and grants; which includes a citation database, a research analysis suite, and modern article access and discovery functionality. The use of this database is free for all users interested in obtaining citations to their published articles, as well as altmetric measurements using social networks and bibliographic reference managers such as Twitter, Facebook pages, mentions in Google+ user, mentions in videos, Biogged, reissues and news in the media.

The Dimensions database (access date: August 11, 2022) was accessed using the following search strategy: (sleep disorders) OR (quality sleep disorders) OR (sleep-wake rhythm disturbances) AND Publication Year: 2021. Thus, 112218 publications, 396 data sets, 381 grants, 193 patents, 2251 clinical trials, and 21722 policy documents were obtained. The search results were ordered in descending order using the Altmetric Attention Score (AAS) as criteria, so that it was possible to select the articles with the greatest attention and relevance in social and scientific networks. The retrieved publications were ranked in descending order based on altmetric attention received (AAS). In this way, the 60 articles that showed the highest levels of attention were selected for a more detailed analysis.

Altmetric data was retrieved and downloaded via the Altmetric.com platform (<https://www.altmetric.com/explorer>), using the public browser option, on August 24, 2022. The Altmetric Attention Score (AAS) for the outcome of an investigation provides a related indicator of the amount of care it has received. The score is derived from an automated algorithm and represents a weighted count of the number of attentions received for a variable source research result.

The metadata of the publications extracted from the Dimensions databases were the following: publication ID, DOI, title, abstract, source title, MeSH terms, publication date, volume, issue, open Access, publication type, authors, authors affiliation, times cited, categories and those related to Altmetric.com: AAS, news, blogs, policy sources, tweeters, facebook, wikipedia, reddit, Q&A, youtube, citations Dimensions, Mendeley readers, F1000, peer reviews, book reviews; they were exported and processed together in an ad hoc database.

To carry out the analysis and visualization of the topics linked to the most popular research, as well as the countries and institutions with the greatest representation and their interactions, maps were designed based on networks of co-occurrences of terms and collaboration networks, through the use of the software VOSviewer v1.6.17 (www.vosviewer.com). The terms were extracted from the title, keywords and abstract fields of the Dimensions database.

To define the visibility of the journals, the SJR indicator, as well as the H Index, was used with the SCImago Journal & Country Rank platform (<https://www.scimagojr.com>).

The variables were analyzed: SCR (Standard competition ranking), AAS (altmetric attention score), TP (total publications), SJR (SCImago Journal Rank), Q (quartile), H (H index).

Microsoft Excel 2019 was used for data processing, their organization and the generation of frequency distribution lists, tables and figures.

The data was handled in accordance with scientific ethics. It was not necessary to obtain informed consent or approval endorsements by scientific and/or ethics committees, given the public nature of the analysis units.

RESULTS

Of the 60 articles with the highest altmetric attention, 50 were publications in journals, nine in preprint servers, and 1 monograph. All the articles are available in open access and with respect to the open access routes, 37 correspond to the golden route, 20 to the published green route and three to the green, accepted and sent route.

It was decided to focus the analysis on the data sources with the highest number of altmetric events, such as news, blog posts, Twitter tweets, Facebook posts, Wikipedia and Redditors pages, Q&A, Youtube, citations in Dimensions, readings in Mendeley, F1000, Peer Reviews and Book Reviews (Fig. 1). Most of the online attention the posts received was on Twitter (285493 total tweets), while the other sources received only a small fraction of the total attention with the largest representation being reads in Mendeley, quotes in Dimensions, stories news and blog posts.

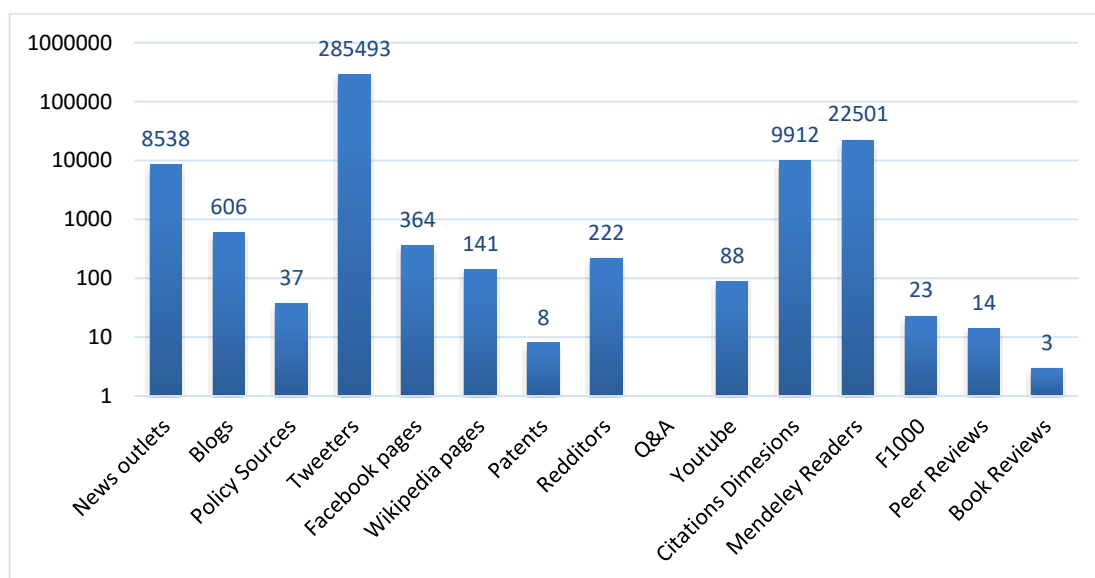


Fig. 1 Mentions received on Altmetric.com by the top 60 publications on Affects on sleep quality

According to the results, the presence of different altmetric data varies greatly. Twitter mentions (86,4 %) provide the highest values. Mendeley readers and citations have the second largest value among all other altmetric data (5,8 %), cumulative citations in Dimensions rank third (3,4 %) and are followed by various network data social and mainstream media, such as news mentions (1,8 %), blog citations (1,5 %), and Facebook mentions (1,1 %).

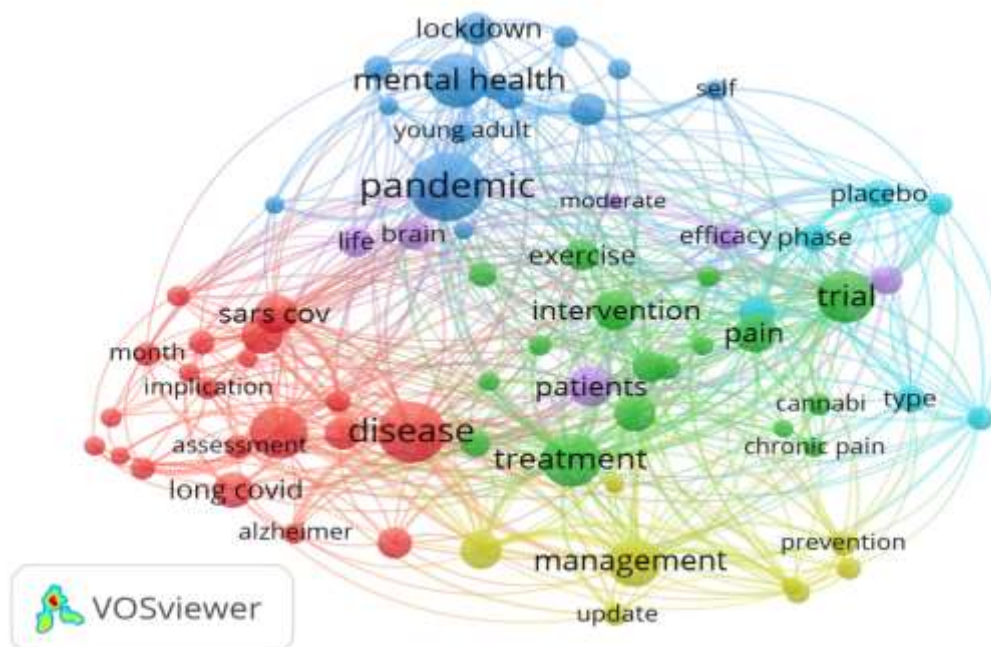


Fig. 2 Main themes of the publications with the greatest altmetric attention

As shown in Fig. 2, groups of publications with similar research topics can be classified into six categories based on the levels of coverage and intensity of attention received. In this framework, the most relevant research topics are those with a high level of publication coverage, and at the same time have also accumulated a relatively high average intensive attention.

In order to identify representative current research topics, from a total of 1854 terms, those that exceeded the minimum of five co-occurrences were selected to represent the topics with the greatest attention in social and scientific networks. As a result, of the 1854 terms, 98 met the threshold and for each of the terms the relevance score was calculated using the basic values of the function provided by the VOSviewer software; Based on this score, 66 % of the most relevant terms (65) were selected with the purpose of obtaining a map with the most representative terms of the scientific domain and with greater readability.

In this way, six clusters were visualized that represented the topics with the greatest attention in social and scientific networks. The cluster with the highest proportion of investigations is identified with the red color and indicates that the investigations that obtained the greatest attention and impact were those related to the intervention of Sars-CoV 2 in pathologies related to neurological diseases and its management in entities related to sleep quality (the main positioned words were: disease, month, implication, long COVID, alzheimer, SARS-CoV, assessment).

In second place is the green cluster related to the intervention, treatment, and clinical presentation of the different sleep-wake rhythm disorders (the main words were: treatment, pain, intervention, exercise, trial, cannabis, chronic pain). This is followed by the dark blue cluster focused on the impact of the pandemic on mental health and personal self-perception in young adults, factors that intervened with the development and increase of insomnia and other manifestations (words such as: pandemic, young adult, mental health, lockdown, self). Finally, the yellow cluster highlights the prevention, progress and management of the disease.

Table 1. Distribution of sources with the highest altmetric attention score (AAS)

SCR	Journals	AAS	TP	SJR	Q	H	Country
1	Sleep Science	41,37	75	0,608	3	21	Brasil
2	Brazilian Journal of Medical and Biological Research	100,13	172	0,522	3	91	Brasil
3	Dementia e Neuropsychologia	12,56	64	0,455	3	25	Brasil
4	Arquivos de Neuro-Psiquiatria	46,51	206	0,427	3	52	Brasil
5	Revista Argentina de Ciencias del Comportamiento	28,87	15	0,185	4	5	Argentina
6	Revista Ecuatoriana de Neurologia	24,91	86	0,132	4	5	Ecuador
7	Archivos de Neurociencias	27,56	50	0,112	4	5	México
8	Neurologia-Neurocirugia Psiquiatria	11,48	12	0,102	4	2	México
9	Revista Brasileira de Neurologia e Psiquiatria	20,76	0	0,102	4	2	Brasil
10	Dementia e Neuropsychologia	30,59	64	0,455	4	25	Brasil

Source: compiled database.

The popularity of an article can also be influenced by magazines (Table 1). The journals that published the most influential articles related to the topic in question are classified in SJR Q3 with relatively high H indices. Therefore, the journal also plays an important role in the altmetric attention potential of an article.

On the other hand, it is evident that a high scientific production can be equivalent to a high altmetric score, since journals with a greater number of publications show higher AAS than other less productive journals. The results corroborate the hegemony of journals from the Latin American world in the production and impact of scientific research on sleep quality disorders, with countries like Brazil and Mexico at the forefront.

DISCUSSION

Research in the area of health is a very prolific field due to the applications and results it provides, which is why the current social media of scientific communication echoes new research of this type.⁽⁷⁾ Within the sciences of health, and specifically neurosciences; It is pertinent to monitor, through the metric alternatives of scientific production, the investigative work of professionals who study SD as a health problem today.

The development of Information and Communication Technologies (TIC), in addition to various channels for scientific communication, has generated methods to measure the social impact of science, among which altmetric indicators stand out as a relatively recent way of evaluating the presence and reach in social networks and academic scientific research. A study published about the altmetric impact in Peruvian Social Sciences articles, verified from a sample of 3092 articles, that 38 % of the articles that carried a DOI identifier had altmetric repercussion.⁽⁸⁾

The presence of the authors in the various social and scientific platforms, and the constant interaction will lead to greater visibility and impact of their productivity from the altmetric to the bibliometric, regardless of the publication route taken (whether gold, green, hybrid, bronze or closed).⁽⁸⁾

However, in the field of Social Sciences there is a statistically significant difference between open or restricted access and mentions from the social networks Facebook and Twitter. In Information Sciences (and Library Science), some authors show that the preference for open access publication allows articles to obtain a greater scientific impact (citations) and in social media (readings).⁽⁸⁾

In the present study, the studies on SW have reached a high volume of publications on Twitter, similar to the study by Alhuay-Quispe et al.,⁽⁸⁾ but in this case, most of the publications came from journals on the Internet gold and green

The authors of this study agree with Uribe-Tirado et al. ⁽⁹⁾ in stating that Twitter has been one of the most studied social network tools in relation to altmetry; these studies have focused on identifying the mention of articles in this network and the visibility and impact that this entails.

Other studies also position Mendeley and Dimensions among the sources that provide the greatest number of mentions in altmetric sources; while blogs and Wikipedia are the sources with the least amount of altmetric data.⁽⁸⁾ These results coincide with those obtained in the present study for the case of SD.

The Da Conceição-Moreira et al.,⁽¹⁰⁾ study in the area of neurosciences, with the theme of emotions and music, presents similar results to those of this study, referring that Twitter and Mendeley present a predominance in terms of mentions, and in this way the main altmetric sources for this topic are considered. In contrast, the percentage of articles without mentions on Facebook, news and blogs exceeds 85%. These results have been verified by different similar studies,^(11,12,13) carried out in the Brazilian context.

An analysis disaggregated by type of open access and altmetric data sources shows that mentions in Mendeley and citations in Dimensions predominate in the restricted and green access paths; on the other hand, the media proportion on Twitter is represented in almost all publication routes.⁽⁸⁾

Regarding citations, the existence of a direct proportional correlation between them and the number of mentions obtained in Mendeley has been verified.⁽¹⁰⁾

Some studies deal with the impact of alternative metrics in specific subject areas, such as Htoo et al..⁽¹⁴⁾ who reviewed the altmetric impact of articles included in the SSCI (Science Citation Index) collection of Web of Science and who found that the impact on Altmetric media favors publications in the biomedical area more than some of the social ones, such as library science, finance, law, and political science.

Journals from the United States and the United Kingdom are overrepresented in bibliographic databases. The core of the most productive journals on COVID-19 is made up of the International Journal of Infectious Diseases, the British Medical Journal, and The Lancet. The Lancet stands out as the first in the ranking of those analyzed with an SJR of 15,87 and an H index of 700, which shows the quality and quantity of its scientific production.^(15,16) In contrast, in the In this study, for the subject of ST, the most productive countries were the Ibero-Americans, especially Brazil and Mexico.

In terms of altmetric score (ASS), the articles analyzed had a higher average (33,7) than those of the altmetric study on music and emotions (8.88), but coincide in the predominance of journals classified in quartiles 3 and 4. Also, in both studies a higher AAS is observed in the journals that have a higher h index.⁽¹⁰⁾

All this analysis leads the authors to agree with Sosa-Valdés et al.,⁽⁷⁾ that the academic impact of an article should not be limited exclusively to the citations received from other articles indexed in certain bibliographic databases.

In other words, a look is required that integrates the bibliometric and the altmetric, in order to thereby have a holistic vision of visibility and impact and thus identify all the forms of links with the environment that a university has; fulfill its mission towards society and its particular context.⁽¹⁷⁾

This altmetric exercise shows that the impact of the research is also being observed from other angles and that it can be done in universities in our Latin American context that can be integrated with bibliometrics and with the relationship with the environment.⁽⁹⁾

Altmetric studies allow us to know how scientific research reverberates and impacts the medical community through social networks and other Internet sites. The research related to Sleep Quality Disorders that most predominated in this study were those published in scientific journals, with the most influential being those published in quartile three journals. Most of the online attention received by these publications was conducted on twitter.

Conflict of Interests

The authors declare that does not exist an interest conflict

Authors' Contributions

EZF, CRAI: Conceptualization, formal analysis, research, methodology, project administration and writing - original draft.

MCJP, VFA, EMZS, ECVO: Formal analysis, conceptualization, research, writing-reviewing, and editing.

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Additional material

Additional material to this article can be consulted in its electronic version available at: www.revcompinar.sld.cu/index.php/publicaciones/rt/suppFiles/5912

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