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Evaluation of prevention, diagnosis and treatment strategies in the covid-19 pandemic: Lessons learned and future perspectives

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Abstract

A documentary review was carried out on the production and publication of research papers on the study of the variables Prevention, Treatment and Covid-19 Strategies. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2020-2022 by Latin American institutions, achieving the identification of 150 publications. The information provided by this platform was organized by means of figures, categorizing the information by Year of Publication, Country of Origin, Area of Knowledge, and Type of Publication. Once these characteristics were described, a qualitative analysis was carried out to determine the position of different authors on the proposed topic. Among the main findings of this research, it is found that Brazil, with 83 publications, was the Latin American country with the highest scientific production registered in the name of authors affiliated with institutions of that country. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material referring to the study of Prevention, Treatment, and Covid-19 Strategies was Medicine with 105 published documents, and the most used type of publication during the above-mentioned period was Journal Articles with 67% of the total scientific production.

Keywords: *Prevention Strategies, Diagnosis, Treatment, Covid-19.*

Introduction

In recent years, the COVID-19 pandemic has had a significant impact worldwide, causing an unprecedented health crisis and challenging health systems, societies, and economies. In the face of this situation, prevention and treatment strategies have been implemented to address the spread of the virus, as well as to mitigate its effects on the population. Prevention strategies have been fundamental to curb the spread of the virus and contain its impact. Measures such as social distancing, use of masks, hand hygiene, and promotion of vaccination have been used, proving to be effective in reducing the transmission of the virus and protecting the most vulnerable people.

Regarding treatment, various therapies and drugs have been developed to treat the symptoms and complications of COVID-19. Scientific research has advanced rapidly, allowing the identification of more effective treatments and the development of vaccines in record time. Mass vaccination has been a key strategy to reduce the severity of cases and lessen the burden on healthcare systems. During this health crisis, several important lessons have been learned. First, the importance of international collaboration and coordination between countries to share information, resources, and best practices has been highlighted. The pandemic has demonstrated the need to strengthen health systems, increase response capacity and improve epidemiological surveillance. It has also demonstrated the importance of clear and effective communication by health authorities to generate confidence in the population and promote healthy behaviors. The dissemination of information based on scientific evidence and the fight against misinformation has been fundamental in promoting preventive measures and increasing the acceptance of vaccination.In terms of future perspectives, it is important to continue strengthening the

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capacity to respond to future pandemics and health emergencies, which implies investing in scientific research, health infrastructure, and epidemiological surveillance systems. It is also necessary to maintain international collaboration and strengthen cooperation mechanisms to jointly face global health challenges. Finally, prevention and treatment strategies have been fundamental in dealing with the COVID-19 pandemic. The lessons learned during this crisis have provided valuable insights to improve the response capacity in the future. It is necessary to maintain the focus on prevention, strengthen health systems, and promote international collaboration to protect the health and well-being of the global population. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variable *Prevention*, Treatment, and *Covid-19 Strategies*, as well as the description of the position of certain authors affiliated with institutions, during the period from 2017 to 2022.

General Objective

To analyze from a bibliometric and bibliographic perspective, the elaboration and publication of research papers in high-impact journals indexed in the Scopus database on the variables Prevention, Treatment, and Covid-19 Strategies, during the period 2020-2022 by Latin American institutions.

Methodology

This article is based on a mixed research approach combining quantitative and qualitative methods.On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of *Prevention*, *Treatment*, and *Covid-19 Strategies*.On the other hand, examples of some research papers published in the area of the study mentioned above are analyzed from a qualitative perspective, based on a bibliographic approach that allows describing the position of different authors on the proposed topic. It is important to point out that the entire search was carried out through Scopus, establishing the parameters referenced in Figure 1.

Methodological design

Figure 1. Methodological design
Source: Own elaboration

Phase 1: Data collection

The data collection was carried out using the Scopus web page search tool, where 150 publications were obtained by choosing the following filters:

- TITLE-ABS-KEY (prevention AND strategies, AND treatment, AND covid-19) AND (LIMIT-TO (PUBYEAR , 2022) OR LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020)) AND (LIMIT-TO (AFFILCOUNTRY , "Brazil") OR LIMIT-TO (AFFILCOUNTRY , "Mexico") OR LIMIT-TO (AFFILCOUNTRY , "Argentina") OR LIMIT-TO (AFFILCOUNTRY , "Colombia") OR LIMIT-TO (AFFILCOUNTRY , "Chile") OR LIMIT-TO (AFFILCOUNTRY , "Peru") OR LIMIT-TO (AFFILCOUNTRY , "Bolivia") OR LIMIT-TO (AFFILCOUNTRY , "Cuba") OR

LIMIT-TO (AFFILCOUNTRY , "El Salvador") OR LIMIT-TO (AFFILCOUNTRY , "Costa Rica") OR LIMIT-TO (AFFILCOUNTRY , "Uruguay") OR LIMIT-TO (AFFILCOUNTRY , "Ecuador") OR LIMIT-TO (AFFILCOUNTRY , "Panama") OR LIMIT-TO (AFFILCOUNTRY , "Puerto Rico") OR LIMIT-TO (AFFILCOUNTRY , "Venezuela") OR LIMIT-TO (AFFILCOUNTRY , "Dominican Republic") OR LIMIT-TO (AFFILCOUNTRY , "Guatemala"))

- Published papers whose study variables are related to the study of Prevention, Treatment and Covid-19 Strategies.
- Limited to the years 2020-2022.
- Limited to Latin American countries.
- Without distinction of area of knowledge.
- Without distinction of type of publication.

Phase 2: Construction of analysis material

The information collected in Scopus during the previous phase is organized and subsequently classified by means of figures as follows:

- Cooccurrence of words.
- Year of publication.
- Country of origin of publication.
- Area of knowledge.
- Type of publication.

Phase 3: Drafting of conclusions and final document

In this phase, the study proceeds with the analysis of the results previously obtained, resulting in the determination of conclusions and, consequently, the final document.

Results

Co-occurrence of words

Figure 2 shows the co-occurrence of keywords found in the publications identified in the Scopus database.

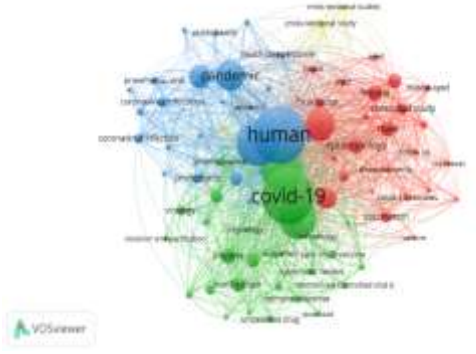

Figure 2. Co-occurrence of words

Source: Own elaboration (2023); based on data exported from Scopus.

Covid-19 was the most frequently used keyword in the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. The pandemic is also among the most frequently used variables, associated with variables such as Epidemiology, Virology, Human, and Review Systems. From the above, it is important to note that prevention was the cornerstone of pandemic management. In recent years, the importance of basic measures such as frequent hand washing, the use of masks, and social distancing to reduce the spread of the virus has become evident. Early implementation of control measures and border closures proved effective even in the early stages of the virus. Similarly, mass vaccination has become a key strategy to contain the spread of the virus and is expected to remain necessary in the future. Continuous epidemiological surveillance, identification of variants, and adaptation of vaccination strategies to these variants are important aspects to consider. In diagnostics, the importance of rapid and accurate testing for early detection of the disease and prevention of its spread has been recognized.

Distribution of scientific production by year of publication

Figure 3 shows the distribution of scientific production by year of publication.

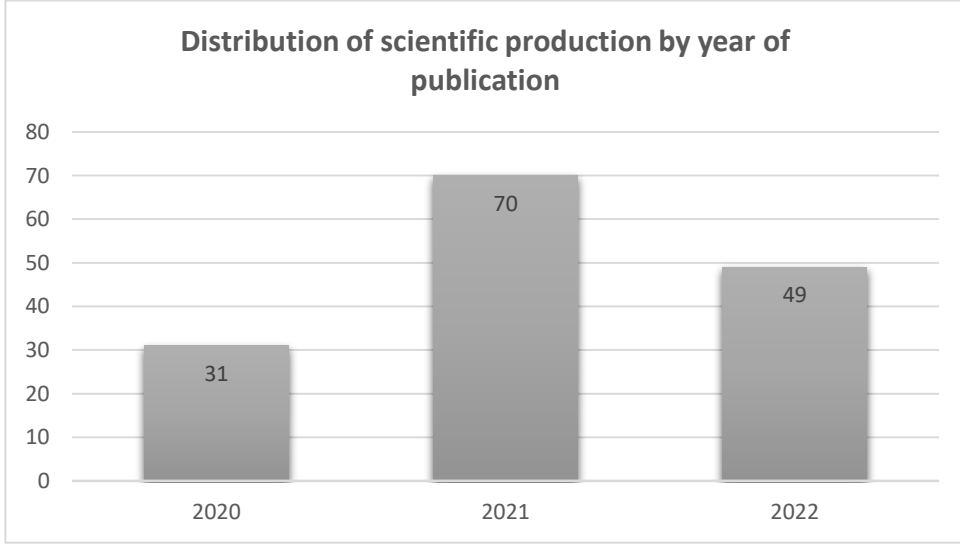

Figure 3. Distribution of scientific production by year of publication.

Source: Own elaboration (2023); based on data exported from Scopus.

Within the main characteristics evidenced through the distribution of scientific production by year of publication, a level of the number of publications registered in Scopus was noted in 2021, reaching a total of 70 documents published in journals indexed in that platform. This can be explained by articles such as "Design and feasibility of an implementation strategy to address the linkage of Chagas guidelines focused on the care of women of childbearing age and children at the primary health care level in Argentina: a pilot study" (Klein, 2022). This research aimed to design an implementation strategy to improve the use of Chagas guidelines focused on the care of women of childbearing age and children at the primary health care level and to pilot it in three primary health care centers in Argentina. Methods: A pilot feasibility study was conducted using the Consolidated Framework for Implementation Research. A qualitative process evaluation was conducted through semi-structured interviews with healthcare providers and observations in primary healthcare centers. Results: A multifaceted implementation strategy was developed including training, flowcharts and reminders, a registry of suspected and confirmed cases, and the selection of a management facilitator. The pilot

study was conducted between September 2019 and May 2020. The level of implementation was heterogeneous and varied across components, with facilitating factors being the simplicity of the intervention, the willingness of practitioners to expand the indication for serological testing, and staff commitment to the adoption of intervention components. The main barriers encountered were the change of authorities at the local level, the reluctance of some professionals to administer etiological treatment, the shortage of personnel, the lack of diagnostic supplies, and the health emergency caused by the COVID-19 pandemic. Conclusions: Behavior change strategies to improve implementation should be applied to address some of the major barriers, including supportive actions offered by opinion leaders, medical experts, and local health authorities.

Distribution of scientific production by country of origin

Figure 4 shows the distribution of scientific production according to the nationality of the authors.

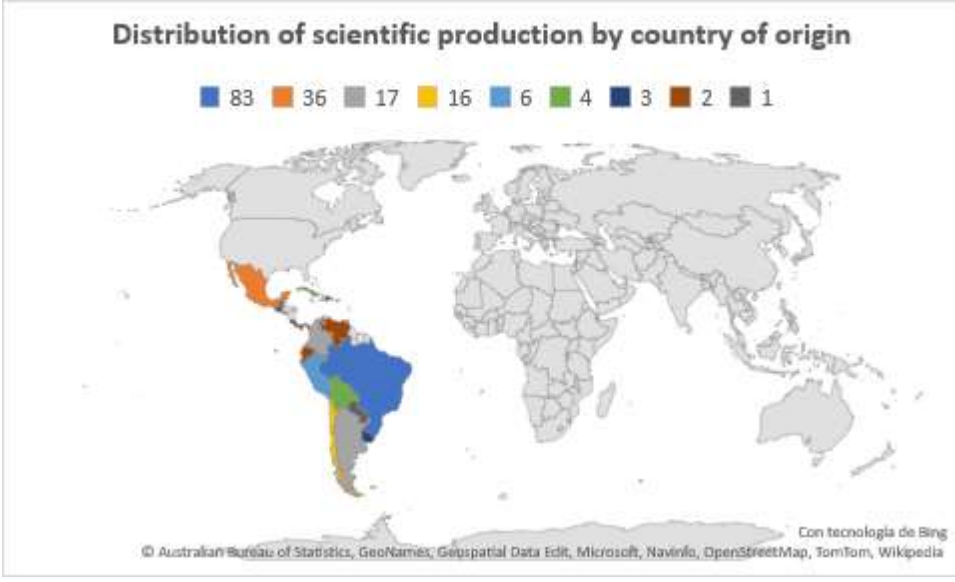

Figure 4. Distribution of scientific production by country of origin.

Source: Own elaboration (2023); based on data exported from Scopus.

In the distribution of scientific production by country of origin, the records coming from institutions were taken into account, establishing Brazil, as the country of that community with the highest number of publications indexed in Scopus during the period 2017-2022, with a total of 83 publications. In the second place, Mexico with 36 scientific papers, and Argentina occupies the third place presenting to the scientific community, with a total of 17 papers among which is the article entitled "Evaluation of the efficacy of UV-C dose for photoinactivation of SARS-CoV-2 in contaminated N95, surgical and cotton cloth respiratory masks" (Metolina, 2022). The study investigated the susceptibility of high SARS-CoV-2 viral load in N95 filtering facepiece respirators (FFR), surgical masks, cotton cloth masks, and N95 straps under three different UV-C doses, applying real-time PCR (qPCR) and plaque formation assays to quantify the reduction of viral load and virus infectivity, respectively. The results show that more than 95 % of the SARS-CoV-2 RNA amount could be reduced after 10 min of UV-C exposure (0.93 J cm-2 per side) on FFR N95 and surgical masks and, after 5 min of UV-C treatment (0.46 J cm-2 per side) on fabric masks. Furthermore, analysis of viable coronaviruses after these different UV-C treatments showed that the lowest dose applied is sufficient to decontaminate all masks (reduction of infective viral load of ~ 3-log10, reduction > 99.9 %). However, for the elastic tape of the N95

respirators, a UV-C dose three times higher than that used for the facemasks (1.4 J cm-2 per side) is required. The findings suggest that full facepiece decontamination can be effectively and safely performed in well-planned protocols for pandemic crises or as strategies to reduce the high consumption and safe disposal of these materials in the environment.

Distribution of scientific production by area of knowledge

Figure 5 shows the distribution of scientific publications according to the area of knowledge through which the different research methodologies are implemented.

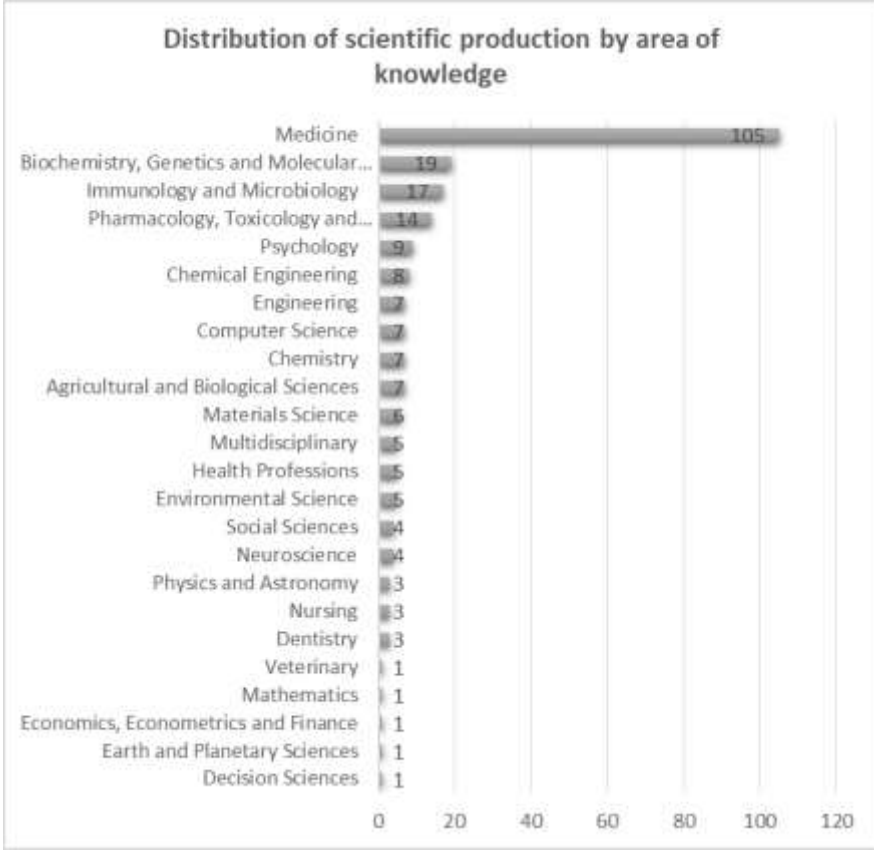

Figure 5. Distribution of scientific production by area of knowledge.

Source: Own elaboration (2023); based on data provided by Scopus.

Medicine was the area of knowledge with the highest number of publications registered in Scopus with a total of 105 documents that based their methodologies on Prevention, Treatment, and Covid-19 Strategies. In second place, Biochemistry, Genetics, and Molecular Biology with 19 articles, and Immunology and Microbiology in third place with 17. The above can be explained thanks to the contribution and study of different branches, the article with the highest impact was registered by the area of Medicine entitled "Immunogenicity after a heterologous versus homologous BNT262b2 booster in kidney transplant recipients who received 2 doses of CoronaVac vaccine: a prospective cohort study" (Medina-Pestana, 2022). This single-center prospective cohort study included kidney transplant recipients with no history of COVID-19. Patients received a third heterologous (BNT162b2 mRNA) or homologous dose at least 4 weeks after 2 doses of the CoronaVac vaccine. Immunoglobulin G antibody response and seroprevalence to neutralizing antibodies to severe acute respiratory

syndrome coronavirus 2 immediately before and 28 days after the third dose were compared between groups. As a result, there were 307 patients in the heterologous group and 777 in the homologous group. Patients in the heterologous group were older (54 versus 50 years; P < 0.0001), with longer time since transplantation (11 versus 6 years; P < 0.0001). Immediately before the third dose, immunoglobulin G seroprevalence (36% versus 34%; P = 0.597) and antibody titers (246 versus 268 AU/mL; P = 0.279) were similar. After the booster, seroconversion was higher in the heterologous group (49 % vs. 32 %; P < 0.0001), resulting in a higher seroprevalence (67 % vs. 55 %; P = 0.0003); however, 42 % of all patients remained seronegative. Antibody titers after booster in seropositive patients were higher in the heterologous group (7771 vs. 599 AU/mL; P < 0.0001). These results persisted after adjustment for confounding variables. Finally, a similar proportion of patients became seropositive for neutralizing antibodies (98% versus 94%; P = 0,098).

Type of publication

Figure 6 shows the distribution of the bibliographic findings according to the type of publication made by each of the authors found in Scopus.

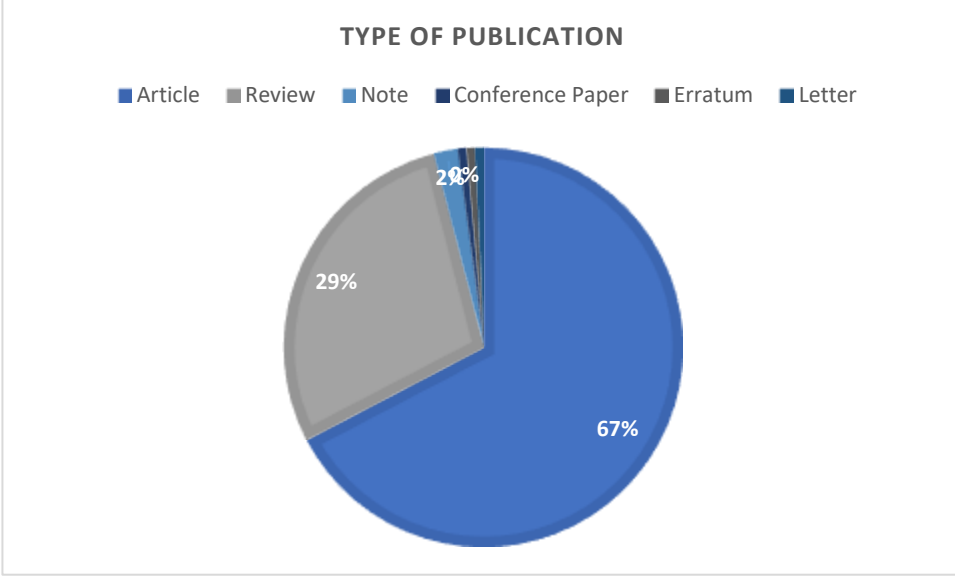

Figure 6. Type of publication.

Source: Own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was the Journal Article with 67% of the total production identified for analysis, followed by Journal with 29%. Notes are part of this classification, representing 2% of the research papers published during the period 2020-2022 in journals indexed in Scopus. In the latter category, the one entitled "Best Practice Statements for Antithrombotic Therapy in the Management of COVID-19: Guidance from the ISTH SSC" (Spyropoulos, 2022) the use of antithrombotics in outpatient and inpatient settings (including intensive care units), thromboprophylaxis in special patient populations, and the management of acute thrombosis in hospitalized patients with COVID-19 stand out. In October 2021, the International Society on Thrombosis and Hemostasis (ISTH) formed a multidisciplinary, international panel of content experts, two patient representatives, and a methodologist to develop recommendations on treatment with anticoagulants and antiplatelet agents for patients with COVID-19. The ISTH Guidelines panel discussed additional topics that are well

suited to an assessment, development, and evaluation of ungraded recommendations (GRADE) for good practice statements (GPS) to support good clinical care in the antithrombotic management of patients with COVID-19 in various clinical settings. The GPS panel agreed on 17 GPS: 3 in the outpatient (prehospital) setting, 12 in the hospital setting in both noncritical care (ward) and intensive care units, and 2 in the immediate post-discharge setting based on limited evidence or expert opinion supporting net clinical benefit in the enactment of the statements provided. The antithrombotic therapies discussed in these GPSs should be available in low- and middle-income countries.

Conclusions

Employing the bibliometric analysis carried out in this research work, it was possible to establish that Brazil was the country with the highest number of published records regarding the variables *Prevention*, *Treatment*, and *Covid-19 Strategies* with a total of 83 publications in the Scopus database. Likewise, it was established that the application of theories framed in the area of Medicine, the COVID-19 pandemic has provided valuable lessons in prevention, diagnosis, and treatment strategies. Basic preventive measures, such as hand washing and masks, are effective in preventing the spread of the virus. The implementation of accurate and readily available diagnostic tests has been instrumental in controlling the disease, and even more innovative technologies are expected in the future. Concerning treatment, the importance of early and appropriate treatment and the need for research and testing of new drugs has been demonstrated. Clear, evidence-based communication and coordination among key players have been essential in the fight against the pandemic and require constant attention. Important factors to consider are mass vaccines, improved health infrastructure, and preparedness for future pandemics. With the help of lessons learned and sound strategies, the public health challenges of the future can be better prepared. Evaluating these strategies during the COVID-19 pandemic provides a solid foundation to address future health crises more effectively, using lessons learned and future perspectives.

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