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Scientific productivity of CorSalud journal: Visibility through Google Scholar

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Acronvms

DeCS: Descriptors in Health Sciences

ABSTRACT

<u>Introduction:</u> Scientific publications are the best way to disseminate research by scientists and professionals. Bibliometrics is an essential tool that allows to evaluate the results of research published in scientific journals.

<u>Objectives:</u> To describe the scientific production of CorSalud journal, using different bibliometric indicators.

<u>Method</u>: Descriptive, longitudinal and retrospective study that evaluated the articles published in the period 2009-2016. Productivity was taken into account by years, countries, authors; articles produced/cited, percentage of inbreeding, occasional or transient authors, transience index, authors' distribution according to productivity, most cited authors, h index, producing institutions, type of articles and keywords.

Results: Three hundred eighty-eight articles were published. Year 2013 was the most productive and cited of all. The most productive author was Francisco Luis Moreno Martínez (19 contributions). A 90.7% of publications are by Cuban authors, 137 are transient for a transience index of 35.3%; 97% are small producers. H index is scarce. The greatest contribution of articles was from the Cardiocentro Ernesto Che Guevara, 29% were original works. Most used keywords were: Acute myocardial infarction, Hypertension, Angioplasty and Echocardiography, among others. Conclusions: The total number of papers per year remains quite stable with prevalence of original articles. National papers tend to prevail over international ones and there is a high inbreeding rate. The bibliometric indicators studied demonstrate stability in the editorial process and an increase in the quality of publications.

Keywords: Bibliometric indicators, Journals, Journal article, Serial publications

Productividad científica de la revista CorSalud: visibilidad a través de Google Académico

RESUMEN

<u>Introducción:</u> Las publicaciones científicas son el soporte por excelencia para divulgar las investigaciones de científicos y profesionales. La bibliometría es un instrumento esencial que permite valorar los resultados de las investigaciones publi-

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cadas en las revistas científicas.

<u>Objetivo</u>: Describir la producción científica de la revista CorSalud, a través de diferentes indicadores bibliométricos.

<u>Método</u>: Estudio descriptivo, longitudinal y retrospectivo que evaluó los artículos publicados en el período 2009-2016. Se tuvo en cuenta la productividad por años, países, autores; artículos producidos/citados, porcentaje de endogamia, autores ocasionales o transitorios, índice de transitoriedad, distribución de los autores según su productividad, autores más citados, índice h, instituciones productoras, tipología de artículos y palabras clave.

<u>Resultados</u>: Se publicaron 388 artículos, el 2013 fue el año más productivo y citado, el autor más productivo fue Francisco Luis Moreno Martínez (19 contribuciones), el 90,7% de las publicaciones son de autores cubanos, 137 son transitorios para un índice de transitoriedad del 35,3%, el 97% son pequeños productores, el índice h es escaso, la mayor contribución de artículos fue del Cardiocentro Ernesto Che Guevara, el 29% fueron trabajos originales y las palabras clave más empleadas: Infarto agudo de miocardio, Hipertensión, Angioplastia y Ecocardiografía, entre otras.

<u>Conclusiones:</u> Existe una estabilidad en el número de trabajos publicados por año, con prevalencia de los originales, tendencia al aumento de artículos nacionales sobre los internacionales, y alta tasa de endogamia. Los indicadores bibliométricos estudiados indican la presencia de una estabilidad en el proceso editorial y aumento en la calidad de la publicación.

Palabras clave: Indicadores bibliométricos, Revistas, Artículo de revista, Publicaciones seriadas

INTRODUCTION

CorSalud emerged in 2009 as an electronic scientific journal dedicated to cardiovascular diseases. It is the official publication of the Cardiocentro Ernesto Che Guevara, a tertiary cardiac center for assessment of these diseases in the central region of Cuba. It is subordinated to the Sociedad Cubana de Cardiología (Cuban Society of Cardiology), has a quarterly frequency and publishes articles in Spanish and English on all aspects related to health and cardiovascular disease. CorSalud is aimed at the dissemination of scientific research conducted by health professionals related to prevention, diagnosis and treatment of cardiovascular diseases worldwide, giving priority to those from the central region of Cuba.

It complies with the certification requirements established for serial scientific-technological publications, included in the third section, article 20, Resolution No. 59/2003 from the Ministry of Science, Technology and Environment of the Republic of Cuba¹. Since the beginning, it has embraced an open

access policy for scientific publication².

The journal is indexed in: VHL (Virtual Health Library), Imbiomed, Latindex, Dialnet, SeCiMed, DOAJ (Directory of Open Access Journals), Google Scholar, EBSCO, SciELO, WordCat, Brown University Library, CONCORDIA University College of Alberta, Hardin-Simmon University Library, Autonomous University of Barcelona, Hochschulbibliothek Reutlingen, Copernicus Index, Poding Memorial Library, York University Library, Butler University Library, SHERPA / RoMEO, CORE (Connecting REpositories), it has presence in 3 social media networks: Fecebook, Twitter, Linkedin³.

Today, with more than 32 issues and more than 388 articles published we should stop along the way and ponder the ground covered in eight years to know the trends and features of this scientific publication over the years 2009-2016 and improve its quality.

Scientific journals are extremely important in scientific disclosures as they are the most efficient way to validate original knowledge and in turn facilitate dissemination within scientific communities. That is why they are the main communication channel in

different areas of knowledge⁴.

Scientific publications are the best support to disseminate research by scientists and professionals in general. Therefore, it is critical to thoroughly assess the quality of the published studies and Bibliometrics is an essential tool that allows evaluating the results of research published in scientific journals. It is also a reliable and universal method to measure productivity in a given sector, as it evaluates the progress and consolidation of the analyzed sector.

Bibliometric analysis not only allows us to retrospectively examine how scientific advances have been achieved and made known, or to evaluate the research potential of the institutions involved, but also to characterize the development of scientific disciplines and their lines of research, scientific publications in an area of knowledge, obsolescence and dispersion⁵.

Bibliometrics is precisely one of the most used metric specialties in recent years. Research sciences make use of such studies to evaluate research performance through indicators. The variables of this method are related to scientific productivity, visibility and impact. Within the most commonly used are: authorship, co-authorship, collaboration networks, years, languages, keywords, documentary typology, index H, Price index, among others. In addition, the mathematical models of Bradford, Lotka, Zip and Price are applied⁶.

These indicators allow to identify the most productive authors in a specific area and at a specific time, collaboration between authors, most cited journals and their impact, number of citations received by articles published in them or centers and countries that generate research, among other aspects. These indicators qualitatively analyze the scientific production impact of any specific author, research group or journal. They are used for the planning and implementation of every aspect related to production and scientific productivity assessment.

We must emphasize that one of the aspects achieving an important development in recent years is the study of scientific journals as the main vehicles for the dissemination and evaluation of scientific research. The level of a scientific journal determines the dissemination and recognition of its published articles and authors⁷.

The objective of this work is to describe the scientific production of CorSalud journal in the period 2009-2016, by means of different bibliometric indica-

tors.

METHOD

A descriptive, longitudinal and retrospective study was designed, for which an intentional sample encompassing all the articles (388) included in CorSalud journal published in the period 2009-2016 was used, distributed in 8 volumes and 32 numbers, visible at: http://www.corsalud.sld.cu/.

In 2013, the first descriptive-transversal-retrospective bibliometric study of the journal was published, which covered the analysis of articles issued between the first quarter of 2009 and the year 2013³.

Theoretical and empirical methods are used for data collection. At the empirical level we used the historical-logical method to base the results from aspects in the analysis with historical and contextual incidence and the inductive-deductive method to analyze and interpret the qualitative results. In this way we can obtain partial conclusions and interpretations related to the phenomenon of study. The documentary analysis is used at the empirical level to consult the main references on the application of the bibliometric method as a research tool. The journal regulations for the interpretation of results were reviewed, and the bibliometric method was applied to carry out a study on the articles that the magazine published from 2009 to 2016.

Mathematical and statistical methods were applied to process the data obtained.

The following data were chosen from the selected articles: the authors' names and surnames (only from the main author of the work, in order to guarantee the highest possible fidelity and homogeneity of the data), citation of the articles, type of article, institutions and country of origin of the authors and keywords.

All the information was entered into a database developed with the use of the bibliographic manager EndNote version X7. From the database generated by this manager, reports were obtained in correspondence with records: authors, years, keywords, among others. To obtain rankings and calculate the selected indicators, the Microsoft Excel program was used, from the Microsoft Office 2010 software package, where the corresponding graphs and tables

were created.

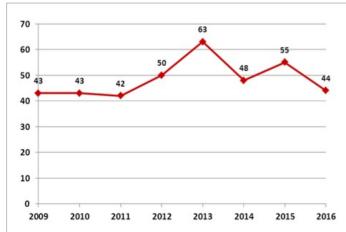
Information was also located through Google Scholar in its role as a gateway to scientific information. Comparisons were made with other studies and with the bibliography consulted in this regard.

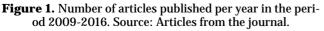
To measure several characteristics within the bibliometric analysis, the following multidimensional indicators were studied ^{8,9}:

- Productivity per years: It allowed knowing and describing the behavior of scientific production in the years analyzed.
- Items produced/cited: It was defined by the number of citations that an article receives.
- Scientific production by countries: It allowed to know the presence of the countries in the articles that are published in the journal.
- Productivity by authors: It allowed to know the most productive and provided data for the subsequent calculation of the journal inbreeding.
- Percentage of inbreeding: Obtained from the amount of articles whose authors were related to the publication and then divided among the total of published articles.
- Occasional or transient authors: Those who possess a single title, generally if this phenomenon occurs there are fewer specialized authors.
- Transience Index: Transient authors are those who present a single publication. It was reflected from the percentage of authors with a publication in relation to the total of authors.
- Distribution of authors according productivity

(Law of Lotka): level of productivity presented by the authors, and distribution in 3 large groups.

- Large producers: produce 10 or more articles
- Medium producers: produce between 5 and 9 articles
- Small producers: produce between 1 and 5 articles.
- Authors most cited: consisted of the authors who receive the most citations and, therefore, those who have the greatest impact.
- H index: It is a position measure. It is the highest order number in a ranking with a total of citations received equal to or greater than that order number by an investigator.
- Institutions producing scientific publications: It allowed to know and describe the behavior of the presence of institutions in the articles published in the journal.
- Evident inbreeding: Based on the analysis of the producing institutions, criteria on the presence of obvious editorial endogamy can be issued. This is true when more than 30% of the institutions are related to the journal or the center where it is located.
- Types of articles: Percentage with respect to the type of research, more than 75% of the articles must communicate original research results.
- Index of keywords used according to the Descriptors in Health Sciences (DeCS): Set of key terms that are repeated in scientific communications.





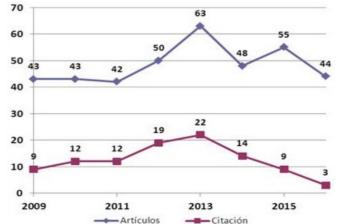


Figure 2. Number of articles published and cited in the 2009-2016 period. Source: Articles from the journal.

RESULTS

In the study conducted, 388 articles were published, with an average of 48.5 per year. **Figure 1** shows that the total production of publications in the period analyzed has been unstable. 2013 was the most productive year, 63 articles, while 2011 had the lowest productivity, 38 articles, the rest remained in a range between 42 and 55.

To determine the number of citations per article, the citations in Google Scholar were manually reviewed, which showed that scientific production visibility of the journal is still insufficient (**Figure 2**), an indicator that was measured by the number of citations each article received. Only 26% of the total 388 articles were cited. It is noteworthy that the most cited year was 2013.

Table 1 resents publications with respect to country of origin. Thus, the majority belonged to Cuban authors (90.7%), with little contribution from other countries. Spain and the United Kingdom have had the highest participation with 2.8 and 1.2%, respectively, which reflects little international presence in the journal.

We identified 388 main authors, of which 10 were the most productive (**Table 2**); 6 of them (60%), members of the editorial board (editorial endogamy), which corresponds also with the percentage of institutional endogamy in the period studied (30%), with 115 institutional authors and 273 external authors (70%).

Of the total 388 authors, 137 were transient, so the transience index was 35.3%. Only 5 were identified as major producers (Francisco Luis Moreno Martínez, Elibet Chávez González, Raimundo Carmona Puerta. Yurima Hernández de la Rosa and Arnaldo Rodríguez León), all members of the journal's editorial board (Figure 3). 6 authors were median: Suilbert Rodríguez Blanco, Margarita Dorantes Sánchez, Antonio de Arazoza Hernández, Guillermo Alberto Pérez Fernández, Pedro Aníbal Hidalgo Menéndez and Eduardo Rivas Estany. The rest were considered as small scientific communication producers (377, 97%). In applying Lotka's law, which refers to an unequal productivity distribution, it was proven that most authors published few works, while a minority published most, so they formed the most prolific group.

The most cited authors were Geovedy Martínez García with 4 publications and 19 citations; Elibet Chávez González with 17 publications and 15 citations, and Yaíma Pérez Agramonte with 1 publication and 13 citations. From the data about the articles and citations that the most productive authors have received, the h index was calculated, which is the combination of productivity and visibility vari-

Table 1. Publications by country of origin in the period 2009-2016.

País	Nº	%
Cuba	352	90,7
Spain	11	2,8
United Kingdom	6	1,2
Mexico	5	1,5
El Salvador	4	1,0
Nicaragua	3	0,8
Egypt	2	0,5
Argentina	1	0,3
Ecuador	1	0,3
United States	1	0,3
Russia	1	0,3
Uruguay	1	0,3

Source: Articles from the journal.

Table 2. Most productive authors in the period 2009-2016.

Most productive authors	Nº of Publications
Francisco Luis Moreno Martínez	19
Elibet Chávez González	17
Raimundo Carmona Puerta	15
Yurima Hernández de la Rosa	15
Arnaldo Rodríguez León	12
Suilbert Rodríguez Blanco	8
Margarita Dorantes Sánchez	7
Antonio de Arazoza Hernández	6
Guillermo Alberto Pérez Fernández	6
Pedro Aníbal Hidalgo Menéndez	6

Source: Articles from the journal.

ables, the result was poor (**Table** 3).

A total of 78 institutions were identified, among them the Cardiocentro Ernesto Che Guevara was the most represented, with 115 contributions out of a total of 388 (30%) (**Table 4**). Likewise, this institution was the largest scientific communications producer, cause of evident endogamy and that is justified because it is the place where the journal is published.

The results obtained also correspond to the analysis of the most productive authors. The journal's editorial committee must ensure that the publication controls the disclosure of articles from the institution of origin to lower inbreeding rates. A negative aspect is the number of original articles that are published (111 for 29%), followed by clinical cases with 66 articles (17%). The rest of the contributions are between 6 and 17%, which reflects an acceptable level between the different types of contributions (Figure 4).

In total, 1302 keywords were counted, 100% match the DeCS; most commonly used were: Acute myocardial infarction (50 articles), followed by hypertension (31 articles), Angioplasty, Echocardiography, Pacemaker, Sudden death and Acute coronary syndrome with 17 articles, respectively (**Figure 5**).

DISCUSSION

The annual production of articles in CorSalud Journal has varied throughout the period studied. This reality is different from the results of the study carried out on the scientific productivity of EDUMECENTRO journal, where there was

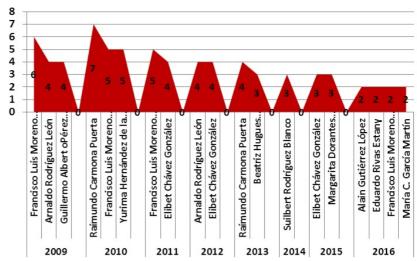


Figure 3. Most productive authors per year in the period 2009-2016. Source: Articles from the journal.

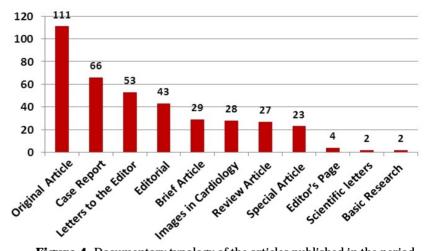


Figure 4. Documentary typology of the articles published in the period 2009-2016. Source: Articles from the journal.

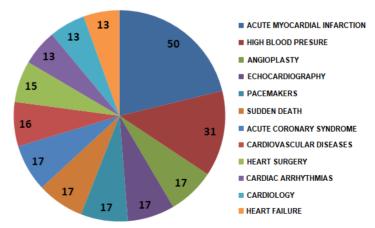


Figure 5. Most used keywords in the period 2009-2016.

found an increase in published articles per year⁶.

Today, journals endorsed by CITMA (acronym in Spanish of Ministry of Science, Technology and Environment) have poor research visibility. The so called "high visibility" have a different scenario because they belong to Anglo-Saxon countries, which is certainly an advantage as they master the English language for medical language¹⁰. There is no doubt that Cuban journals have not developed within a favorable panorama, which allowed them to easily be inserted to wide international circulation.

Table 3. Most cited authors and h index in the period 2009-2016.

Most cited authors	Nº of Publications	Nº of Cites	H index
Geovedy Martínez García	4	19	
Elibet Chávez González	17	15	2
Yaíma Pérez Agramonte	1	13	
Francisco Luis Moreno Martínez	19	12	2
Beatriz Hugues Hernandorena	4	11	
Amelia Carro	1	10	
Giselle Serrano Ricardo	4	10	
Luis A. Ochoa Montes	2	9	
Niurelkis Suárez Castillo	1	9	
Yurima Hernández de la Rosa	15	9	

Source: Articles from the journal.

Table 4. Origin of articles published in the period 2009-2016.

Institutions	Nº of Publications	
Cardiocentro Ernesto Che Guevara	115	
Hospital Universitario Celestino Hernández Robau	31	
Instituto de Cardiología y Cirugía Cardiovascular	27	
Universidad de Ciencias Médicas de Villa Clara	25	
Cardiocentro Pediátrico William Soler	21	
Hospital Clínico-Quirúrgico Hermanos Ameijeiras	20	
Hospital Universitario Arnaldo Milián Castro	13	
Cardiocentro del Centro de Investigaciones Médico Quirúrgicas (CIMEQ)	11	

Source: Articles from the journal.

With the new Internet scenario our journal was able to adhere to new and important national and international initiatives aimed at increasing the visibility of publications, such as the Virtual Health Library (VHL), Scientific Electronic Library Online (SciELO), the Red de Revistas Científicas de América Latina y el Caribe, España y Portugal (Redalyc) (Network of Scientific Journals of Latin America and the Caribbean, Spain and Portugal), the Índice Mexicano de Revistas Biomédicas Latinoamericanas (Mexican Index of Latin American Biomedical Jour-

nals) (IMBIOMED), in the Índice Latinoamericano de Publicaciones Científicas Seriadas (Latin American Index of Serial Scientific Publications) (Latindex), in DIALNET, and in the Directory of Open Access Journals (DOAJ), leader in the movement of open access to information and premise for all Latin American journals. Although the journal has important scientific accreditation stamps, such as the Web Médica Acreditada (Accredited Medical Web) (WMA), from the Colegio Oficial de Médicos de Barcelona (Official College of Physicians of Barcelona), among others, and with spaces in social and academic networks such as: Facebook, Twitter, Linkedin¹¹, at present it has a very low visibility index.

Regarding the distribution by countries, CorSalud journal publishes basically local production, since 90.7% of the articles are by Cuban authors, followed by Spain and the United Kingdom. Progressively it has been reaching greater consolidation in other Latin American countries, such as Mexico, El Salvador, Nicaragua, Argentina, Ecuador and Uruguay, and the Anglo-Saxon world (USA and United Kingdom).

According to the study conducted by Arencibia¹², foreign authors should be encouraged to publish in the journal through international projects with the national institutions that most often publish in it. This would increase their visibility and the numbers would be more

heterogeneous within the same volume.

Researchers should try to publish in other journals that are not from their own institution, not only to form new work networks, but because this malpractice is penalized for future indexing requests in prestigious database journals¹³.

Minimizing editorial inbreeding indexes, will favor the positioning and visibility of scientific publications. Inbreeding is currently rigorously analyzed by indexing sources evaluators⁹.

It must be borne in mind that the number of occasional authors (authors with only one publication in the study) is an index that gives an idea of the scientific activity consolidation in a country, area or discipline; consequently, a high percentage of occasional authors would be worrying and its decrease would be advisable¹⁴. In production by author, a good pattern of adjustment to Lotka's law is observed, with a few prolific producers and a great variety in the signatures number¹⁵.

According to Rodríguez and Rodríguez¹⁴, productivity studies by authors were investigated by Lotka, and evidenced the existence of a small group of very productive authors, together with a large number of authors who hardly publish, which is consistent with the results achieved in this study.

The number of citations received for an article is a measure of its recognition and influence within the scientific community. The analysis of the scientific literature can help identify articles, lines of research and authors of influence. Therefore, academic institutions and scientists in general, are increasingly interested in using citation analysis to assess research quality and researchers productivity¹⁶. The present analysis corroborates that quantity does not mean quality. Everything that is published does not have the same impact. Some publications receive many citations in less than a year; however, others will never be cited¹⁷.

Ten recommendations that should be considered by scientific journals have been proposed in order to increase the number of citations: increase journal dissemination, include the journal in as many databases as possible, publish controversial articles, reviews, in English, articles on current issues, articles by well-quoted authors, establishing agreements with the media, recommending that works published in the same journal be cited and providing access to articles on the Internet¹⁸.

The Cardiocentro Ernesto Che Guevara owns the scientific production by institutions, which coincides with the study carried out by López Tápanes³. Our

study confirms that, although CorSalud is the official organ for disseminating the scientific results of health professionals anywhere in the world, prioritizing those of the central region of Cuba, it is the professionals of this region who most frequently publish their articles in the journal. Such an observation may persuade the editorial board to encourage authors from other countries to publish in it.

In the present investigation it was observed that the "original articles" stand out as the most published documentary typology, which coincides with different studies^{3,16}, since it is part of the editorial policy of any scientific journal to prioritize «original» research results publication ¹⁶.

The analysis of the most used keywords confirmed that the subjects in the published articles correspond to their mission and scope. The high percentage of keywords that coincide with the DeCS denotes good knowledge from part of the authors and, above all, a special attention of the editorial team in their correct use. This fact considerably facilitates a correct indexing of articles in the bibliographic databases, their subsequent recovery and their classification by area of knowledge¹⁹.

CONCLUSIONS

The number of works published in the journal per year remains stable. National articles continue to be the largest, although there is a growing increase in works sent from Spain and the United Kingdom. High rate of inbreeding is evidenced. Francisco Luis Moreno Martínez was the main contributor in this period. The h index of the most productive authors is scarce. The largest number of published works corresponds to the Cardiocentro Ernesto Che Guevara. Original articles were the most represented in all published issues. Key words used are related to Cardiology and its subspecialties.

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