

Bibliometric analysis of the scientific production on cardiology published in the Cuban student scientific journals (2014-2018)

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ARTICLE INFORMATION

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Acronyms

R16A: Revista 16 de Abril

RUMP: Revista Universidad Médica Pinareña

SSJ: student scientific journals

ABSTRACT

Introduction: Research is the driving force of science and, at present, cardiology is a critical area in Medicine.

Objective: To evaluate the scientific production on cardiology published in Cuban student scientific journals in the period 2014-2018.

Método: A descriptive and retrospective bibliometric study was carried out; 30 articles were assessed throughout the study. Variables representing indicators of production, visibility and impact were included.

Results: The 70% were published in Revista 16 de Abril. There was a predominance of articles with 4 authors (36.67%) as well as research papers on hypertension (36.66%). The articles presented an average of 21.33 bibliographical references. Price index in the articles ranged between 0.12 and 0.75. From all the articles published, 1 was international (3.33%). The province of Pinar del Río contributed 26.67% of the publications. We found 10 authors with more than one publication and 20% of articles were cited. The 50% of cited articles were bibliographic reviews and only two have a corrected citations number greater than 1.

Conclusions: The publication of scientific articles on cardiology in Cuban student scientific journals is poor. Multiple authorship is common and the largest volume of articles is generated in provincial centers and universities. It is compulsory to improve research dissemination in order to achieve greater visibility and therefore citation.

Keywords: Scientific production, Cardiology, Bibliometrics, Journals, Journal article, Students

Análisis bibliométrico de la producción científica sobre cardiología publicada en las revistas científicas estudiantiles cubanas (2014-2018)

RESUMEN

Introducción: Las investigaciones constituyen el motor impulsor de la ciencia. La Cardiología es una de las áreas de la medicina de gran importancia en la actualidad.

Objetivo: Evaluar la producción científica sobre Cardiología publicada en revistas científicas estudiantiles cubanas en el período 2014-2018.

Método: Se realizó un estudio bibliométrico descriptivo y retrospectivo. El universo quedó constituido por 30 artículos. Se incluyeron variables que representaron indicadores de producción, visibilidad e impacto.

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Resultados: El 70% de los artículos se publicaron en Revista 16 de Abril. La temática predominante fue la hipertensión arterial (36,66%). Existió un predominio de artículos con 4 autores (36,67%), con una media de 21,33 referencias bibliográficas. El índice de Price en estos osciló entre 0,12 y 0,75. Del total de los publicados 1 fue internacional (3,33%). La provincia de Pinar del Río aportó el 26,67% de las publicaciones. Se encontraron 10 autores con más de una publicación. El 20% de los artículos recibieron citas. El 50% de los citados fueron revisiones bibliográficas y solamente dos poseen un número de citas corregidas superior a 1.

Conclusiones: La publicación de artículos científicos sobre cardiología en las revistas científicas estudiantiles cubanas es escasa. La autoría múltiple es común y el mayor volumen de artículos es generado en los centros provinciales y universidades. Se hace necesario un mejor trabajo en la difusión de las investigaciones para lograr mayor visibilidad y por ende, citación.

Palabras clave: Producción científica, Cardiología, Bibliometría, Revistas, Artículo de revista, Estudiantes

INTRODUCTION

Research articles on science and information are the driving force behind science in the new society; opening new doors for the use of tools and indicators that allow for a much more accurate assessment of scientific journals behavior, authors and institutions¹.

The scientific dissemination of research reports is an ever changing world and there is growing interest in research and publication; hence the need for powerful tools to thoroughly assess the information generated, dissemination supports and impact. This is where bibliometrics comes in.

Among other aspects, bibliometric research facilitates decision making and help us verify information and investigation visibility. It also shows any technological development taking place in a specific context².

This type of research is often used to assess the impact of scientific diffusion means, authors or areas of knowledge through the study on different kinds of indicators. Such indicators seek to determine elements related to impact, evolution and status. Hence, these investigations are a rapidly changing scientific field which serves as a support for the evaluation of different areas of knowledge.

Its use is not restricted to the quantitative list of published or unpublished references of an author, country, subject or region; but also covers citation frequency and trends affecting impact and visibility, international or national collaboration relationships between authors or institutions, and channels through which the registered information circulates³.

These facilitate the understanding of regularities

and phenomena occurring in the scientific field and trends in documentary information flow. Scientometric indicators facilitate meaningful comparisons and, according to the results, allow to draw up strategies to improve journal quality. Moreover, based on the comparisons provided by bibliometrics, quality and evaluation schemes would be established and its influence on the scientific and academic environment can be assessed. Similarly, it allows readers –the end user of knowledge generated– to decide which journal may be of interest and significantly contribute to their professional training⁴.

The World Health Organization reports that more people die every year from cardiovascular diseases than from any other cause; according to figures from this organization, it is estimated that 17.5 million people died in 2012, representing 31% of all deaths worldwide⁵.

Cardiology is the branch of Medicine related to these diseases and being a science in itself, continues to draw on the knowledge coming out every day. Scientific journals are one of the sources for this knowledge generation and dissemination. There are some student scientific journals (SSJ), among them which are in charge of disseminating young science.

Up until recently there were only two SSJ in our country. For this reason, both the Ministerio de Salud Pública and the Federación Estudiantil Universitaria decided and managed to create one in each province. When surfing the INFOMED telematics network we come across Revista Universidad Médica Pinareña (RUMP) in Pinar del Río, Revista 16 de Abril (R16A) in Havana, Progaleno in Camagüey, Inmedsur in Cienfuegos, CienciMed in Ciego de Ávi-

la, 2 de diciembre en Granma and UniMed in Santiago de Cuba. Only the first four have published at least one issue.

The present study is essentially aimed at evaluating the scientific production on cardiology published in Cuban SSJ over the period 2014-2018.

METHOD

A descriptive and retrospective bibliometric study of the scientific production on cardiology published in the Cuban SSJ was conducted between January 2014 and December 2018. Of the 7 SSJ accessible through the Infomed network we evaluated just four fitting the inclusion criteria: to have at least one published issue and articles where cardiology is the main theme. Only thirty articles with these characteristics were found.

The data were collected through the journals websites:

- RUMP (<http://galeno.pri.sld.cu>)
- R16A (<http://www.rev16deabril.sld.cu>)
- Progaleno (<http://www.revprogaleno.sld.cu>)
- Inmedsur (<http://www.inmedsur.cfg.sld.cu>).

We used theoretical methods such as analytical-synthetic, which allowed the analysis of theoretical sources and basic contents to deepen bibliometric studies and contextualize their definition. The historic-logical was used to carry out the different bibliometric analysis and literature on the subject besides being used to interpret results and draw conclusions; as well as trends periodization and location in a timeline. At the empirical level, we utilized a data collection form to compile proposed variables of each article. Data were stored in a computerized database and processed using the statistical package SPSS version 21.0.

The variables taken into account were: journal and year of publication, number of authors, type of article, subject matter, center and province of origin, citations received and used references.

For the analysis of the data, summary measures used at the descriptive level (absolute frequency and relative percentage) were applied. The Price index⁶ was used to analyze the references update degree. Since the oldest articles are more likely to

have been cited, the corrected number of citations was used⁷.

RESULTS

The 70% of the articles were published in Revista 16 de Abril, the largest number of them in 2014 (60%) and none in 2015 (**Table 1**). There was a predominance of articles with multiple authorship, those with 4 authors represented 36.67%; and those having hypertension as a core theme (36.66%), followed by those related to cardiovascular risk (16.67%) (**Figure**).

Papers presented an average of 21.33 bibliograph-

Table 1. Distribution according to some variables of cardiology articles published in student scientific journals 2014-2018.

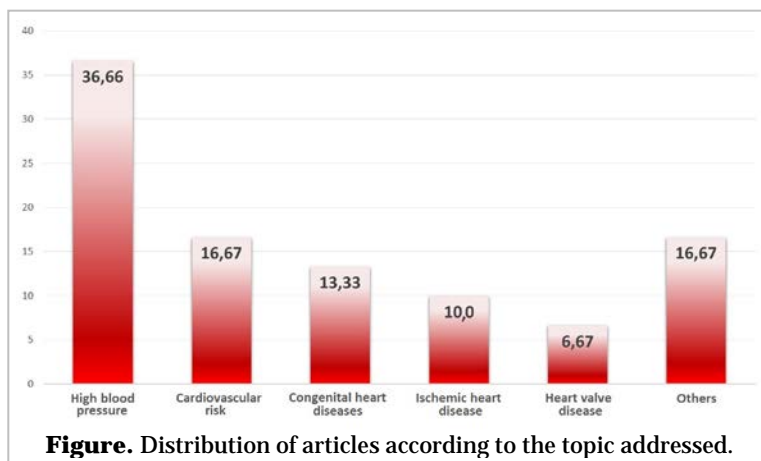
Variable	Nº	%
Journal of publication		
Revista 16 de Abril	21	70.0
Revista Universidad Médica Pinareña	7	23.34
Inmedsur	1	3.33
Progaleno	1	3.33
Year of publication		
2014	18	60.0
2016	2	6.67
2017	2	6.67
2018	8	26.66
Number of authors		
1	1	3.33
2	2	6.67
3	4	13.33
4	11	36.67
5	10	33.33
6	2	6.67
Total	30	100

ical references per article and their Price index ranged between 0.12 and 0.75; and that of the journals, between 0.33 and 0.8. In general, the publications had a 44% bibliographic references update; that is, less than 5 years old (**Table 2**).

From the total number of articles published only one was international (Mexico) for a 3.33% of the scientific production on cardiology in Cuban SSJ. Pinar del Río province contributed a 26.67% of publications. 73.33% came from a College or Medical Sciences Faculty, while 16.66% came from regional centers and only 10% from Primary Health Care (**Table 3**).

We found 10 authors with more than one publication, where they all had 2 publications. Only Adrián Augusto Naranjo Domínguez and Leandro Jorge Riverón Cruzata received citations (**Table 4**).

Only 6 articles (20%) received citations; only one received more than one citations. The 50% of the articles cited were bibliographic reviews and only 2 had a corrected number of citations greater than 1 (**Table 5**).



DISCUSSION

The current state of scientific student production no longer shows the student as a mere apprentice, but as the author of their own research, generating contributions to science. In this sense, the SSJ play a leading role in the diffusion of the science produced in the undergraduate program, especially by medical science students⁸, whose production in Cuba has

Table 2. Price index distribution according to type and journal.

Typology and Journals	Nº	Referen-ces	Mean	Oldness			Price Index
				≤5	6 - 10	≥11	
Type of articles							
Original articles	16	334	20.87	156	106	72	0.47
Special articles	3	82	27.33	10	39	33	0.12
Editorials and Letters to the Editor	2	37	18.5	27	5	5	0.73
Case reports	1	12	12	9	3	0	0.75
Bibliographic reviews	7	170	24.28	77	67	26	0.45
Short communications	1	5	5	1	3	1	0.2
Journals							
Revista Universidad Médica Pinareña	7	125	17.86	93	23	9	0.74
Revista 16 de Abril	21	473	22.52	154	192	127	0.33
Inmedsur	1	12	12	9	3	0	0.75
Progaleno	1	30	30	24	5	1	0.8
Total	30	640	21.33	280	223	137	0.44

Table 3. Distribution of articles according to province.

Province	Nº	%
Pinar del Rio	8	26.67
Villa Clara	6	20.0
La Habana	3	10.0
Camagüey	2	6.67
Cienfuegos	2	6.67
Las Tunas	2	6.67
Santiago de Cuba	2	6.67
Artemisa	1	3.33
Granma	1	3,33
Guadalajara, México	1	3,33
Guantánamo	1	3,33
Mayabeque	1	3,33

presented an increase in recent times⁹. This, in synergy with the development of SSJ in the country, meets the validity for research profile of the upcoming graduate in Cuban higher medical education⁸. Until recently, R16A was well-known as a national SSJ, which could be accessed –via internet– from anywhere in the world, which is why most of the research was sent to this journal, as it has greater impact. However, RUMP was only accessible via INFOMED network, thus having limited visibility. For more than a year and thanks to its full visibility, this journal has shown increasing production indicators.

Naranjo and Gabino¹⁰ found 2015 to be the most productive year in the period 2014-2016, and Ferreira-González *et al*¹¹ found an increase in articles received since 2014 (822 articles) up to 2015 (960). This is in contrast with results found in the present investigation; however, Valdés González *et al*¹² found, in the period 2014-2016, that 2015 was the least productive year for RUMP, and –likewise– in that year no article referring to cardiology was published in the Cuban SSJ. A similar event was reported by Díaz-Díaz and Falcón-Hernández¹³, who analyzed the Cuban production on cardiopulmonary and cerebral resuscitation, and concluded that no article was published on this topic in 2015.

The opening of Cuban scientific journals for stu-

Table 4. Distribution of most productive authors according to number of publications.

Autor	Nº
Guillermo González Ojeda	2
Adrian Augusto Naranjo Domínguez	2
Marcos Iraola Luques	2
Milagros Carmona Escarabelino	2
Yaimet Casas Carbonell	2
Yoel Manresa Contreras	2
Alejandro Gutiérrez Hernández	2
Lisete Sanabria Villar	2
Fidel Pérez Marrero	2
Leandro Jorge Riverón Cruzata	2

dent publication means that the production of specific topics, such as cardiology, is mainly sent to specialized journals such as CorSalud, the Cuban Journal of Intensive Medicine and the Cuban Journal of Cardiology and Cardiovascular Surgery. Collaboration indicators measure the relationships established between those who produce a result coming up from cooperative efforts. The importance of institutional collaboration is related to the very nature of scientific research, which requires collaboration as to create knowledge¹⁰. Although multiple authorship is known to favor the validation and credibility of investigations, measures must be taken when granting authorship. Therefore, only those who meet their criteria should be recognized and not be delivered for gratification.

A number of studies¹⁴⁻¹⁶ found predominance of articles with two or more authors, more often with 4 and 5, with an average ranging between 3.62 and 4.07 authors per article, which coincides with our investigation. However, a bibliometric analysis performed on MEDICC Review¹⁷, found an average of 2.32 authors per article, while the research by Alfonso Arroyo *et al*¹⁸ found an average of 12.4.

Among cardiovascular diseases, ischemic and hypertensive diseases are those with higher incidence and mortality; showing increases from one year to the next¹⁹; hence, they are the most interest-

Table 5. Distribution of articles according to citations received.

Journal	Year	Typology	Title and Authors	Cite	NCC
R16A	2014	BR	Diabetes mellitus type 2: An overview of the cardiovascular risk. Arianna Espinosa Sánchez, Ana Liz Rodríguez Porto, Mayra Sánchez León	4	1
R16A	2014	Ed	Joint National Committee, the most controversial hypertension guideline, again. Alberto Morales Salinas, Arasay Rodríguez Sanabria	1	0.25
R16A	2014	SA	Global cardiovascular risk in patients older than 40 years. Medical Office Nº 23. Policlínico "Turcios Lima" 2009-2010. Adrian Augusto Naranjo Domínguez, Ángel Yaniel Rodríguez Navarro, Agustín Jesús Montano Sánchez, Rosa Elena Llera Armenteros, Ronald Aroche Aportela	1	0.25
R16A	2014	BR	Peripartum cardiomyopathy in modern cardiology. Alain Velázquez Rego, Claudia Nodarse Guardado, Pedro Antonio Román Rubio	1	0.25
R16A	2016	BR	Mitral valve prolapse, a literature review. Leandro Jorge Riverón Cruzata, Dianelis Karusagna Toranzo Rojas, Sussete Ricardo Ávila, Luis Manuel Pérez Concepción	1	0.5
RUMP	2018	OA	Risk factors for atherosclerosis in diabetic old people in a medical office. Jessica María González Casanova, Roylando de la Caridad Valdés Chávez, Adrián Ernesto Álvarez Gómez, Karina Toirac Delgado, María de la Caridad Casanova Moreno	1	1

BR, bibliographic review; Ed, editorial; NCC, number of corrected citations; OA, original article; R16A, Revista 16 de Abril; RUMP, Revista de la Universidad Médica Pinareña; SA, special article.

ing for researchers. It also happens with studies to determine cardiovascular risk, because they allow to draw strategies to avoid unfavorable events; therefore, many of the publications address this subject.

There are many investigations²⁰⁻²⁴ with predominance of original articles. They make greater contributions to science and are major generators of new knowledge mainly in medical sciences, an area of study where clinical practice prevails.

Corrales-Reyes *et al*⁷, state that the amount of bibliographic references in the last five years is an indicator of research quality; and point out that, for review articles, the percentage of topicality must be higher, in accordance with the research nature and the criteria of authors.

Arias⁶ exposes the Price Index for different subjects. In the case of Medicine is 36.5% with an average 6.8 lifespan. This is one of the indicators on scientific literature aging, which expresses references percentage up to five years old or less, in relation to the total number of cited references. Scientific articles acquire greater validity when they are support-

ed by up-to-date citations that bring about accurate discussions and reflections.

Other authors have found values of this index similar to ours: 0.17-0.84¹⁷ and 0.34-0.52²³. In our research, Inmedsur and Progaleno presented a higher price index as new SSJ and have a still poor and more recent volume of articles.

Several studies^{1,25} identify Colleges, Medical Sciences Faculties, hospitals and regional centers, as those with high scientific production, which coincides with the results of our research. This may be related to the fact that these centers lodge a larger number of students, there is a tendency to encourage more research and there are more teachers with research status and a habitual motivation to serve as students' tutors.

In relation to the geographical origin of the articles, we disagree with other investigations, which found Havana²³ and Ciego de Ávila⁹ as top producers. The presence of an international article may reflect the international recognition of the Cuban student scientific publication.

A high number of transient authors was identified, which highlights a low taxpayers specialization and coincides with that reported by Morales *et al*²⁶.

Original articles have the highest number of citations²⁷, which does not coincide with our findings. The corrected citation index allows you to have an overview of the article footprint by allowing a "fair" comparison between the impact of an article based on citations received and the time it has been published.

The low number of citations received by the articles been analyzed in this research may reflect their poor dissemination. At present, both authors and scientific journals should bear in mind that the editorial process does not end with article publishing, but its dissemination in social and academic networks. Moreover, scientific journals should meet the indexation criteria from different databases, since the presence in indexing and indexation services allows high investigation visibility.

CONCLUSIONS

The publication of scientific articles on cardiology in Cuban student scientific journals is scarce. Original articles are the predominant publication, multiple authorship is common, and the largest volume of articles is generated in provincial centers and universities. It is compulsory to improve research dissemination in order to achieve greater visibility and therefore citation.

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