

Bibliometric analysis of the Journal of the Spanish Pain Society: 2007-2016

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ABSTRACT

Objective: Analyse the scientific production of the Journal of the Spanish Pain Society, in the period 2007 - 2016, through a bibliometric study.

Material and methods: Descriptive-retrospective analysis of the journal's production during the period studied. Ten indicators were used, divided into four categories: productivity, citation, information consumption and content indicators.

Results: A total of 597 documents were published, of which 292 were original, equivalent to 49 % of the total production. The journal received 546 citations between 2007 and 2016; 54.6 citations per year and 0.91 citations per document. 1,245 authors signed the documents; 1,108 of them published a single document in the period studied. The minimum number of authors signing for a document is 1 and the maximum 41. The cooperation rate is 2.08. The countries with the largest contribution of documents are Spain (440), Mexico (39) and Chile (27). Hospitals are the type of institution with the most published documents (73 %); the most productive hospital is Puerto del Mar University Hospital, also called Seguridad Social de Cádiz Hospital. The average number of references per article is 22. English is the predominant language in references (85 %).

Conclusions: Article is the predominant document, and is also the most cited. The journal is open access, which can positively influence the number of citations received. The indexing of the

journal in well-known databases can also be a factor that influences the number of citations. Spain and the Latin American countries have significant contribution of documents. This may be related to the language factor (Spanish). 75 % of the documents were written by two or more authors. Collaboration is generally between people from the same country. Collaborative work between authors from different countries is low. However, it has shown an increase in recent years. The analysis may be useful to increase the journal's visibility and impact.

Key words: Bibliometric Analysis, scientific productivity, bibliometric, Journal of the Spanish Pain Society.

RESUMEN

Objetivo: Analizar la producción científica de la *Revista de la Sociedad Española del Dolor*, en el periodo 2007 a 2016, a través de un estudio bibliométrico.

Material y métodos: Análisis descriptivo-retrospectivo de la producción de la revista durante el periodo estudiado. Los indicadores utilizados fueron 10, divididos en cuatro categorías: indicadores de productividad, indicadores de citación, indicadores de consumo de información e indicadores de contenido.

Resultados: Se publicó un total de un total de 597 documentos, siendo originales 292 de ellos, lo que equivale al 49 del total de la producción. La revista recibió 546 citas entre 2007 y 2016; 54,6 citas por año y 0,91 citas por documento. Aparecen 1.245 autores firmantes de los documentos; de ellos, 1.108 publicó un solo documento en el periodo estudiado. El mínimo de autores para un documento es 1 y el máximo 41. El índice de cooperación es 2,08. Los países con mayor contribución de documentos son España (440), México (39) y Chile (27). El tipo de institución con más

documentos publicados son los hospitales (73 %), siendo el más productivo el Hospital Universitario Puerto del Mar, también denominado Hospital de la Seguridad Social de Cádiz. La media de referencias por artículo es de 22. El idioma predominante en las referencias es el inglés (85 %).

Conclusiones: La tipología de documento preponderante es el artículo, siendo estos mismos mayoritariamente los más citados. La cantidad de citas recibidas puede verse afectada positivamente por ser la revista de acceso abierto y por su indexación en diversas bases de datos. España y los países latinoamericanos tienen una alta contribución de documentos, lo que puede deberse a un factor idiomático. El 75 % de los documentos fue escrito por dos o más autores, pero la colaboración es generalmente entre personas del mismo país. El trabajo colaborativo entre autores de distintos países es bajo, sin embargo, ha mostrado un aumento en los últimos años. El análisis puede ser de utilidad para aumentar la visibilidad e impacto de la revista.

Palabras clave: Análisis bibliométrico, productividad científica, bibliometría, *Revista de la Sociedad Española del Dolor*

INTRODUCTION

The advent of information technologies has brought about a sustained increase in scientific publications, which involves the need to analyse this significant production arising from investigative activity.

One of the main quantitative methods used in this field is bibliometric analysis or bibliometrics, defined as the application of mathematical methods to scientific literature, based on statistics and bibliometrics (1). Using different indicators, bibliometrics provides an infographic of publications regarding a certain field of knowledge, revealing trends in the production of scientific information.

From the various sub-disciplines studied in the field of health, one of the most significant (and transversal) relates to the treatment of pain, whose effect is indiscriminate, regardless of the underlying illness suffered. The international reference in this discipline is the International Association for the Study of Pain (IASP) which, in its Spanish version, is the Sociedad Española del Dolor (SED), which works with professionals who offer contributions in the field, generating progress related with understanding of the mechanisms of pain and its treatment, advising the health authorities on treatment and the use of analgesic drugs, informing on the possible implications of pain therapies and helping to improve managing patients and providing valid approaches to treating patients (2). The

Society's objectives are reflected in the publications of its journal.

The *Journal of the Spanish Pain Society* was founded in the year 1994 by the Spanish Pain Society; it is published every two months and is indexed on databases such as Scopus and SciELO, among others. It is open access (3), so you can access the documents it contains without the need for subscriptions, from the SciELO web page (<http://scielo.isciii.es/scielo.php>) or from the journal's website (<http://www.resed.es/>).

Considering the importance of applying bibliometric analysis to scientific publications (as it has become a tool that lets us analyse the quality of the knowledge generation process and the impact of this process on the environment [4]) and the fact that none have been carried out based on the *Journal of the Spanish Pain Society*, this study's objective is to analyse scientific production published in the journal, in the period 2007 to 2016.

MATERIAL AND METHODOLOGY

Design

A descriptive-retrospective bibliometric analysis was carried out regarding the journal's production during the period 2007-2016, both years inclusive.

Indicators

The bibliometric indicators are numerical data calculated from the bibliographical characteristics seen in the documents that permit analysis of various features of scientific activity, associated both with the production and consumption of information (5).

For the study, 10 indicators were used, classified in four categories:

- Productivity indicators: including number and distribution of publications, also indices of personal productivity, collaboration, nationality, institutionality.
- Citation indicators: comprising number of quotes and articles most quoted.
- Indicators of information consumption: total bibliographical references, language of references.
- Content indicators: index of document type.

Data collection and analysis

The Scopus (Elsevier) database was used to collect data, applying the search term "Revista de la Sociedad Española del Dolor", using the filter "Source Title". The search was also limited with the filter "Date Range" 2007-2016. The information was subsequently reviewed on the journal's web page, for greater constancy of information and later results.

Data analysis was carried out with the integrated functions of Scopus, exporting the information obtained there to Microsoft Excel, in order to apply its statistical functions to obtain percentages and draw up graphs.

RESULTS

The period 2007-2016 was analysed, which represents a total of 10 volumes (one volume per year), 68 issues (between 2007 and 2010, 8 issues were published per volume, and between 2011 and 2016 it dropped to 6 issues per volume), and 597 published documents, with an average of 59,7 documents per year.

The year with most production was 2010, with 69 published documents, and the one with least production was 2013, with 49 published documents.

Type of documents

Among the 597 documents published between 2007 and 2016, 292 corresponded to original articles (*Originals*), which is equivalent to 49 % of total production.

Then we have *Reviews* ($n = 127$; 21 %), followed by *Letters* ($n = 94$; 16 %), *Editorials* ($n = 69$; 11.5 %), *Erratum* ($n = 5$; 0,8 %), *Notes* and *Short Surveys* ($n = 4$; 0.7 % each); and finally *Conference Papers* ($n = 2$; 0.3 %).

The above reveals that originals are the predominant type of document in the Journal's production during the years analysed (Table I).

Citation indicators

Number of citations

Of the total documents published on the date analysed, 222 of them received at least one citation, which represents 37% of articles cited in the total published (Table II).

The total citations received by the journal between 2007 and 2016 is 546, which corresponds to 54.6 citations per year and 0.91 citations per published document.

The year with the largest number of citations is 2009, with 135 citations, and an average of 2.07 appointments per document, and the year with the lowest number of citations is 2016, with 4 citations, which is equivalent to 0,42 citations per document.

Of the 546 total citations received, 21 corresponded to citations obtained the same year of the document's publication.

Articles with largest number of citations

The ten most mentioned articles received between 13 and 8 citations, as shown in Table III. The article most cited

TABLE II
INDICATORS OF CITATIONS BY YEAR

YEAR	Citations/Year	Citations/Documents /Year
2007	114	1.75

TABLE I
TYPE OF DOCUMENTS PUBLISHED IN THE *JOURNAL OF THE SPANISH PAIN SOCIETY*,
PERIOD 2007-2016

Year	Original	Review	Letter	Editorial	Erratum	Note	Conference paper	Short survey	Total documents
2007	36	21	1	7	0	0	0	0	65
2008	29	16	8	8	1	0	0	1	63
2009	38	9	8	10	0	0	0	0	65
2010	29	12	18	8	0	1	0	1	69
2011	24	12	10	7	0	0	0	2	55
2012	25	12	12	6	1	0	1	0	57
2013	22	13	6	6	0	1	1	0	49
2014	35	7	13	5	1	0	0	0	61
2015	30	7	5	8	1	2	0	0	53
2016	24	18	13	4	1	0	0	0	60
TOTAL	292	127	94	69	5	4	2	4	597
%	49 %	21 %	16 %	11.5 %	0.8 %	0.7 %	0.3 %	0.7 %	100 %

2008	68	1.07
2009	135	2.07
2010	82	1.18
2011	47	0.85
2012	40	0.7
2013	21	0.42
2014	24	0.39
2015	11	0.2
2016	4	0.06

It is worth mentioning that the ten most cited articles come from Spain.

Indicators of information consumption

Total indicator of references

The 597 documents published between 2007 and 2016 used a total of 13,131 bibliographical references, with an approximate average of 22 references per document (Table IV).

TABLE III
MOST CITED ARTICLES FROM THE *JOURNAL OF THE SPANISH PAIN SOCIETY*, PERIOD 2007-2016

#	Title	Author (es)	Year	Country	Citation
1	Quality of life related with the health and confrontation strategies for pain in patients assisted by a pain treatment units	F. Torre Mollinedo, J. Martín-Corral, A. Callejo, R. M. Vallejo, (...) A. Arizaga	2008	Spain	13
2	Standards of assistance quality and catalogue of procedures of chronic pain units	J. L. de la Calle, D. Abejón, J. Cid, (...) J. Insausti, E. López	2010	Spain a	12
3	Cavidol: quality of life and pain in primary health care	M. D. C. López-Silva, M. Sánchez de Enciso, M. C. Rodríguez-Fernández, E. Vázquez-Seijas	2007	Spain a	12
4	Pain prevalence among institutionalized geriatric patients	J. Álaba, E. Arriola	2009	Spain a	10
5	Depression, anxiety and fibromyalgia	E. Revuelta Evrard, E. Segura Escobar, J. Paulino Tevar	2010	Spain a	9
6	Analysis of not choosing epidural analgesia during childbirth among Andalusian women: "the good sufferer"	L. Biedma Velázquez, J. M. García de Diego, R. Serrano del Rosal	2010	Spain a	9
7	Observational study on slight or moderate postoperative pain from the point of view of the anaesthesiologist in Spain. PATHOS	M. A. Vidal, L. M. Torres, J. A. de Andrés, M. Moreno-Azcoitia	2007	Spain a	9
8	Epidemiology of cancer pain	D. Reyes Chiquete, J. C. González Ortiz, A. Mohar Betancourt, A. Meneses García	2011	Spain a	8
9	Assessment of social and clinical factors in fibromyalgia syndrome	M. Salgueiro, I. Buesa, Z. Aira, (...) J. Bilbao, J. J. Azkue	2009	Spain a	8
10	Recommendations for treating neuropathic pain	J. R. González-Escalada, M. J. Rodríguez, M. A. Camba, A. Portolés, R. López, R	2009	Spain a	8

corresponds to one by F. Torre Mollinedo et al., titled "Quality of life related with health and confrontation strategies for pain in patients assisted by a pain treatment unit", which has 13 citations.

TABLE IV
NUMBER OF BIBLIOGRAPHICAL REFERENCES
USED PER YEAR

Year	References Year
2007	1.707
2008	1.175
2009	1.579
2010	1.483
2011	1.419
2012	1.273
2013	1.097
2014	1.257
2015	1.017
2016	1.124
TOTAL	13.131

The year when the largest number of bibliographical references was used was 2007, with 1,707 references, followed by 2009 with 1,484, and 2010 with 1,483.

We should point out that the three years with most bibliographical references are also the years with the most number of citations received.

Index: language of references

As regards the language of bibliographical references, documents were used in 17 different languages (calculation carried out based on titles of documents), with English being the language most used, with a total of 11.232 documents in this language, representing more than 85% of the total number of references (Figure 1).

This is followed by Spanish, with 1,733 references, meaning 13% of the total, and German, with 52 documents, corresponding to 0.4% of the total references used.

Productivity indicators

Indicator of productivity per person

The total number of authors in the period reviewed is 1,245. Of these, the most productive author produced 54 documents, followed by two authors with 15 documents, 1 author with 14 and one with 12 documents (Table V and Figure 2). Conversely, 1,108 authors published a single document in the period studied.

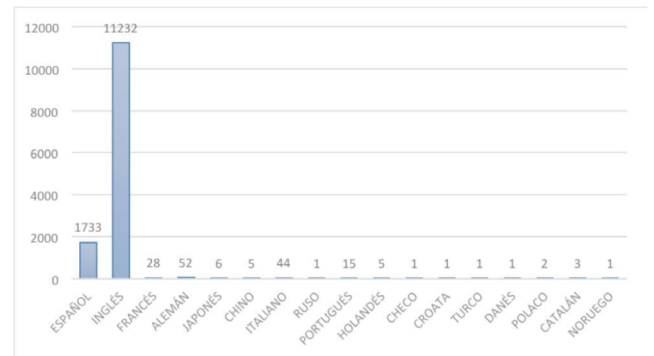


Fig. 1. Language of the bibliographical references used.

TABLE V
PRODUCTIVITY BY AUTHOR

Authors	Documents
1	54
2	15
1	14
1	12
2	11
2	10
3	8
7	7
6	6
12	5
20	4
40	3
40	2
1.108	1

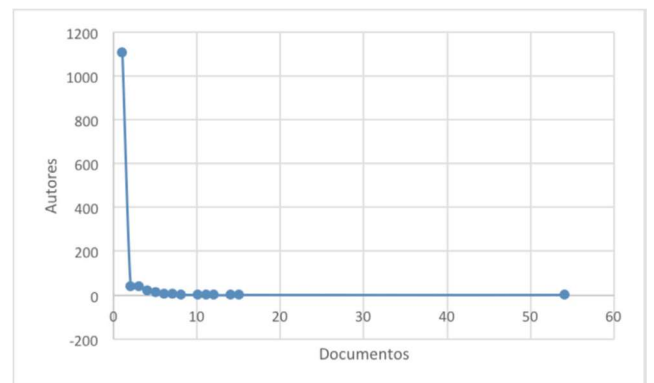


Fig. 2. Total documents by author.

The above implies that 89% of authors had a single article, 3% had two articles, and only 8% of total authors had 3 or more articles published in that period. This verifies that the bibliometric quantification based on the Lotka's law, which states that the largest number of authors publish the smallest number of works, while the smallest number of authors publishes a greater number of works, this being the most productive group (6).

Collaboration indicator

The collaboration indicator has a relationship with the number of authors signing a document, and "is usually used as measure of scientific collaboration among several authors", and it lets us determine the size of investigation groups (7) (Table VI).

In this case, 75% of documents (n = 447) had collaboration, that is, they were drawn up by two or more authors, with a group of three authors who most signed documents (n = 84; 14%), followed by groups of five and two authors (13% each).

24% was not carried out in collaboration, which implies that 145 documents have a single signature.

The above suggests the cooperation indicator as 2.08.

Nationality indicator

For the study period, the total number of countries contributing to documents is 28, with Spain participating

the most, with 440 published documents, followed by Mexico with 39, Chile with 27, Colombia with 22 and the United States with 22. Thirteen of the countries have contributed 1 document (Figure 3).

Table VII shows a predominant participation of Spanish authors (69%) which is probably related with the fact that the journal is Spanish. However, over recent years one we can see a major increase in participation from other countries, including a predominant participation from Latin American countries. This may be due to the language variable.

In 5% of cases, the nationality of authors is not defined.

As regards the international collaboration, out of a total of 597 documents, 26 of them (4%) show collaboration among countries: 23 documents - 2 countries; 1 document - 3 countries; 1 document - 5 countries; 1 document - 8 countries. However, 571 documents (96%), do not show inter-country collaboration.

Institutionality indicator

As regards documental production by type of institution, Figure 4 shows a clear prevalence of hospitals, which provide 73% of documents (n = 435). This is followed by universities (n = 67; 11%), then the group of "others" (n = 48; 8%), comprising documents produced by pharmacists, laboratories, institutes, foundations, inter alia. Finally, production on the whole, that is, documents produced by more than one institution (n = 42; 7%). Institutional collaboration most represented is hospital-university.

TABLE VI
INDICATORS DOCUMENT AUTHORS (COLLABORATION)

YEAR	1 AU	2 AU	3 AU	4 AU	5 AU	6 AU	7 AU	8 AU	9 + AU	NO APLICA	TOTAL DOCs.
2007	20	7	14	4	4	11	3	1	1	0	65
2008	14	8	10	5	11	5	5	3	1	1	63
2009	17	7	5	7	7	11	4	2	3	2	65
2010	21	6	12	11	5	5	4	0	5	0	69
2011	13	3	7	8	6	8	4	5	1	0	55
2012	15	11	5	6	10	6	2	1	1	0	57
2013	9	9	8	3	10	3	3	2	1	1	49
2014	12	4	11	14	9	5	3	2	1	0	61
2015	9	9	7	6	10	5	3	1	2	1	53
2016	15	14	5	5	7	9	1	2	2	0	60
TOTAL	145	78	84	69	79	68	32	19	18	5	597
%	24 %	13 %	14 %	12 %	13 %	12 %	5 %	3 %	3 %	1 %	100 %

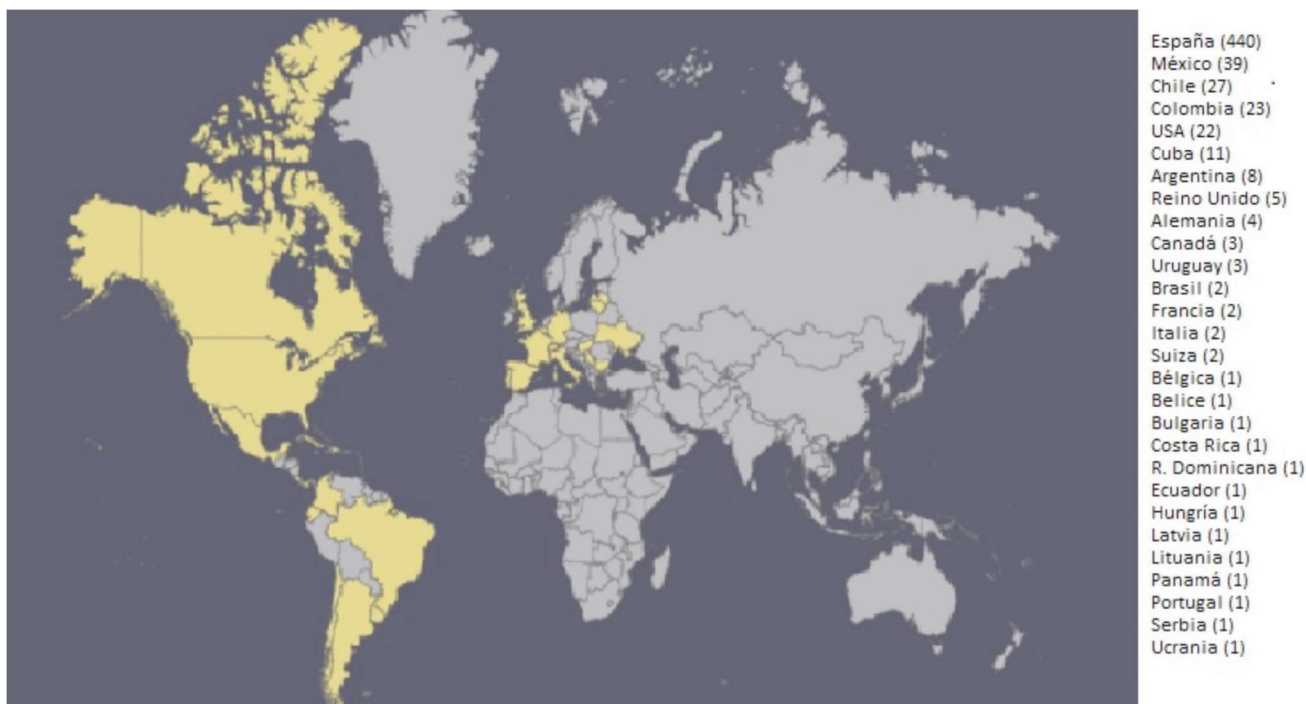


Fig. 3. Contribution by country.

TABLE VII
CONTRIBUTION OF AUTHORS BY COUNTRY

YEAR	Spain	Other countries	Country not defined
2007	52	13	4
2008	46	16	3
2009	47	18	4
2010	57	11	2
2011	44	8	3
2012	40	16	3
2013	31	17	7
2014	39	24	3
2015	41	23	1
2016	43	20	1
TOTAL	440	166	31
%	69 %	26 %	5 %

Regarding the production for each of the participating institutions, Table VIII shows the ten organizations with the largest number of contributions, according to the information from Scopus. However, we should point out that the registers from Hospital Universitario Puerta del Mar and the Hospital de la Seguridad Social de Cádiz correspond to the same institution. Therefore, this hospital has contributed 79 documents on the date analysed.

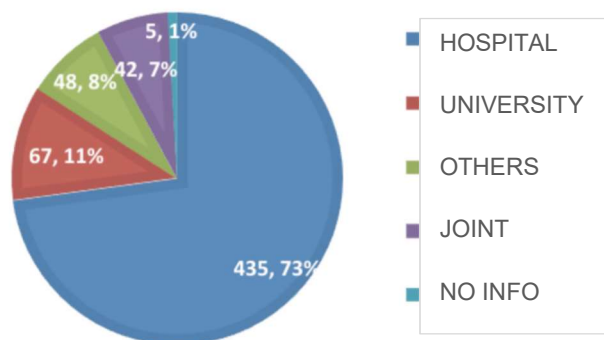


Fig. 4. Production by type of institution.

DISCUSSION

The bibliometric analysis of the Journal of the Spanish Pain Society for the period 2007-2016 shows the trends in the indicators studied.

Articles are the predominant type of document (n = 292). The journal received 546 citations in the period studied (54,6 citations per year), which meant for 7 years (of the ten comprised) in Q3 of the category Anaesthesiology and Pain (area medicine), of Scimago Journal & Country Rank.

TABLE VIII
DOCUMENTS BY INSTITUTION

Hospital Universitario Puerta del Mar	(46)
Hospital de la Seguridad Social, Cádiz	(33)
Hospital Clinic Barcelona	(26)
Hospital General Universitario Gregorio Marañón	(20)
Hospital Universitario Puerta de Hierro	(17)
Hospital Ramón y Cajal	(16)
Hospital Universitario de Valme	(16)
Hospital Regional Universitario Carlos Haya	(15)
Hospital Universitario Puerto Real	(13)
Complejo Hospitalario Universitario de Granada	(12)

The number of citations received may be a positive decisive factor in the fact that the journal is open access, which lets interested investigators free, immediate access to the journal's documents. Another relevant aspect as regards citations may be related with the journal's indexing in different free databases, such as Scopus, Scientific Electronic Library Online (SciELO), Spanish Bibliographical Index in Health Sciences, among others.

Among the 10 most mentioned documents (which obtained between 13 and 8 citations), 7 correspond to articles and 3 to reviews, which is related to the predominant type of document (article, followed by review).

The country that contributed most documents was Spain, with 440 (the home country of the journal). The above is part of the trend that shows articles are published to a greater extent in the country where the journal is published (1).

This is followed by Mexico with 39, Chile with 27 and Colombia with 22. The conclusion is that the significant participation of Latin American countries has a major language component, as the journal publishes documents in Spanish.

As regards the collaboration indicator, although high, shows mostly with authors of one same country. Inter-country collaborative work is low, but has seen an increase in recent years.

The bibliographical references used amount to 13,131

(median = 22), starting from 1,707 in the year 2007 and showing a downward trend in the last five years (1,124 in 2016). The predominant language of references is English, followed by Spanish.

This bibliometric analysis is the first study of this type for the Journal of the Spanish Pain Society, which makes it especially relevant, as the bibliometric methods "are now firmly established as scientific specialties and are an integral part of research evaluation methodology especially within the scientific and applied fields." (8). Therefore, the information from this study will be useful for the journal's editorial board, providing data on the scope and visibility of the journal's publications, and guidelines to increase its levels of impact.

CONFLICTS OF INTEREST

The authors declare they have no conflicts of interest.

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