



SPECIAL ARTICLE

# Half a century of *Anales de Pediatría*. Evolution of its main bibliometric indicators in the Web of Science and Scopus international databases<sup>☆</sup>



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Received 15 November 2018; accepted 17 December 2018

Available online 7 February 2019

## KEYWORDS

*Anales de Pediatría*;  
Bibliometric  
indicators;  
Scopus;  
Science Citation  
Index Expanded;  
Scientific impact

## Abstract

**Purpose:** To analyze the coverage and main bibliometric indicators of *Anales de Pediatría* in Scopus and Science Citation Index Expanded of the Web of Science (SCIE) databases.

**Material and method:** The evolution of the journal production was identified according to the document types, collaboration indexes between authors and institutions, and citations, and impact indicators (number of citations, impact factor, 5-years impact factor and without self-citations, Scimago Journal Rank, quartile, *h*-index and most cited works).

**Results:** A total of 10,128 papers were included in Scopus (a mean of around 225 per year) and 1861 in SCIE (a mean of around 207 per year). The index of collaboration was 4.4 for authors and 2 for institutions. There was international collaboration in 4.2% of the papers. The number of citations received in Scopus (619) exceeded the number of citations received in SCIE (385) by 234. The mean number of citations per paper was lower in SCIE (2.27 in Scopus compared to 1.5 in SCIE). The *h*-index was 18 in Scopus and 14 in SCIE.

**Conclusions:** Discrepancies were observed in the indicators obtained in both databases due to the different indexation policies, coverage, and classification methods of the papers. The number of citations, the mean number of citations per work, and the *h*-index were higher in

<sup>☆</sup> Please cite this article as: González de Dios J, Alonso-Arroyo A, Aleixandre-Benavent R. Medio siglo de *Anales de Pediatría*. Evolución de sus principales indicadores bibliométricos en las bases de datos internacionales Web of Science y Scopus. An Pediatr (Barc). 2019;90:194.e1-194.e11.

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**PALABRAS CLAVE**

*Anales de Pediatría*;  
Indicadores  
bibliométricos;  
Scopus;  
Science Citation  
Index Expanded;  
Impacto científico

Scopus due to the longer life of the journal in that database. There is a positive evolution of the impact factor in SCIE, of the impact factor excluding self-citations, and of the 5-year impact factor.

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### Medio siglo de *Anales de Pediatría*. Evolución de sus principales indicadores bibliométricos en las bases de datos internacionales Web of Science y Scopus

#### Resumen

**Objetivo:** Analizar la cobertura y los principales indicadores bibliométricos de *Anales de Pediatría* en las bases de datos Scopus y Science Citation Index Expanded de la Web of Science (SCIE).

**Material y método:** Se identificó la evolución de la producción de la revista según los tipos documentales, los índices de colaboración entre autores e instituciones y los indicadores de citación e impacto (número de citas, factor de impacto, factor de impacto de 5 años y sin autocitas, Scimago Journal Rank, cuartil, índice h y trabajos más citados).

**Resultados:** Se han incluido 10.128 trabajos en Scopus (225 anuales de media) y 1.861 en SCIE (207 anuales de media). El índice de colaboración de los autores ha sido de 4,4 y el de las instituciones, de 2. La colaboración internacional se ha producido en el 4,2% de los trabajos. El número de citas recibidas en Scopus (619) supera en 234 las citas recibidas en SCIE (385). El promedio de citas por trabajo ha sido inferior en SCIE (2,27 en Scopus frente a 1,5 en SCIE). El índice h ha sido de 18 en Scopus y de 14 en SCIE.

**Conclusiones:** Se observaron discrepancias en los indicadores obtenidos en ambas bases de datos debido a las diferentes políticas de indexación, cobertura y métodos de clasificación de los trabajos. El número de citas, el promedio de citas por trabajo y el índice h han sido más altos en Scopus debido a la mayor pervivencia de la revista en esa base de datos. Se observa una evolución positiva del factor de impacto en SCIE, del factor de impacto excluyendo las autocitas y del factor de impacto de 5 años.

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## Introduction

Advances in the study of childhood diseases and their social and economic impact require a continued support of research, including the publication of research findings in scientific journals and open-access journals. A better understanding of the trends in the performance of *Anales de Pediatría* in different bibliometric indicators and an increased awareness of the complexities and challenges faced by the journal may contribute to improving its future development.

Previous studies have analyzed the scientific production in the field of pediatrics in Spain.<sup>1-7</sup> However, little is known about the evolution of different bibliometric indicators of the performance of *Anales de Pediatría* in the 2 international databases that contribute data and metrics regarding citation and impact in which *Anales* is indexed, Scopus and the Science Citation Index Expanded of the Web of Science Core Collection (SCIE).

The coverage of *Anales* in these databases has been inconsistent and irregular, both in terms of the annual number of indexed publications and in the frequency distribution of publications by type of document. For instance, the

journal has been indexed in Scopus between 1973 and 2002 under the title *Anales Españoles de Pediatría* and from 2003 to present under the title *Anales de Pediatría*,<sup>8</sup> whereas it has only been indexed regularly in the SCIE since 2009. These differences in coverage may give rise to numerous discrepancies in bibliometric indicators depending on whether the data are extracted from one or the other database. For instance, the total number of citations of documents in the journal in the past 9 years (2009–2017) is 4638 in Scopus, compared to 2799 in the SCIE—1839 fewer citations (data extracted on September 12, 2018). There are even variations in other indicators that are less dependent on the source of the data, such as the average number of citations per publication, which is 2.27 in Scopus and only 1.5 in the SCIE.

Taking this context into account, our objective is three-fold:

- a) To analyze the evolution of the main bibliometric indicators of the scientific output, collaborations and impact of *Anales de Pediatría* in the SCIE and Scopus databases in the years that they indexed the journal.

- b) To offer accurate data on the actual coverage in these sources and to evince how differences in the editorial policies of the databases regarding how records are indexed may contribute to the variability in indicators, which is source-dependent and results from the discrepancies in the data contributed by the databases that process records and citations.
- c) To identify the indicators for which *Anales de Pediatría* exhibits an increasing, decreasing or uneven evolution, aiming at establishing possible trends.

## Materials and methods

The methodology involved several phases: 1st, download of the records of databases; 2nd, selection of strictly scientific types of documents (original articles, editorials, scientific letters and review articles); 3rd, normalization of missing or incorrect data; 4th (a) extraction of output indicators (number of articles per type of article category and year of publication; (b) calculation of collaboration indices (year-by-year trends in the author collaboration index; year-by-year trends in international collaboration); (c) Evolution of citation-based indicators (number of citations; impact factor; 5-year impact factor without self-citation; Scimago Journal Rank [SJR]; *h*-index; most cited documents or "hot papers"; annual citation rate of the most cited documents; worldwide ranking of the journal for the impact indicators); 5th, identification of the indicators in which *Anales de Pediatría* exhibited an increasing trend, a decreasing trend and an uneven trend.

To obtain these data and these metrics, we used 4 sources: the SCIE of the Web of Science Core Collection, Journal Citation Reports (JCR), Scopus and SCImago Journal & Country Rank.

All these indicators are defined in the sources specified above and have been analyzed in previous studies,<sup>9-13</sup> except the citation rate of the most cited documents, calculated by dividing the total number of citations by the years elapsed from the publication of the work.

## Methodological considerations

When it comes to the types of document included in this study, we must take into account that we only considered the categories used by the databases, which did not always coincide with the classification originally used by the journal. For instance, articles classified in *Anales* as "brief original articles" were categorized as "articles" in SCIE and Scopus, and the same applied to articles categorized in *Anales* as "Special articles", "Which is the diagnosis", "Clinical notes" and "Images in paediatrics". On the other hand, documents originally categorized as "Editor's columns" were classified as "Letters" in Scopus. Since our study of the data in Scopus started with the selection of records excluding documents classified as "notes", "congress communications", "sections on the Asociación Española de Pediatría" and "articles in press", it is possible that some indicators do not fully agree with those reported in the SCImago Journal & Country Rank website. We downloaded the data from the already cited sources on September 19, 2018.

## Results

### Coverage and types of documents in Scopus and SCIE

Fig. 1 illustrates the coverage of the journal in Scopus (since 1973) and in SCIE (since 2009). Scopus has included 10,128 works, a mean of 225 per year, while SCIE has included 1861 (18.4%), a mean of 207 per year. Coverage in Scopus has been uneven, with peaks of nearly 500 works (for instance in 1998, due to the inclusion of 2 supplements, one of them with 205 documents) and marked troughs (such as the 152 documents covered in 1994). In SCIE, the coverage has been more consistent, although there has been a decreasing trend, with the number of included documents dropping from 250 in 2009 to 160 in 2017.

When it came to document coverage, we found discrepancies between the 2 databases in the distribution of the 4 types of documents under consideration. The proportion of articles was 74% in Scopus vs 46% in SCIE, the proportion of letters 16% vs 38%, that of editorials 3% vs 16%, and the proportion of reviews 7% vs 0.54% (Fig. 2).

### Collaborations between authors, institutions and countries

In Scopus, most articles were signed by 5 (19%) or 6 authors (18%), reviews by 1 (27.4%) or 2 (15.4%), letters by 4 (30.5%) or 5 (23.1%) and editorials by 1 (53.3%) or 2 (26.8%).

The average number of authors of multi-authored documents in Scopus during the entire period under study was 4.4. The minimum was 2.5 in 1974 and the maximum 5.8 in 1995 and 2007 (Fig. 3). This index decreased between 2007 and 2010 (to 4.7) and has been recovering in the past few years, reaching the present 5.1 in 2017.

The average number of collaborating institutions per work has shifted from 2.6 in 1996 to 3.2 in 2017. The peak occurred in 2007 (3.7). The average for the entire period under study was of 2 institutions per work. There were 1164 documents without a declare affiliation, and of the remaining 8694 documents, 57% did not involve collaboration between institutions. The percentage of works that involved international collaboration in the 2009-2017 period was 4.2%.

Fig. 4 presents the network of collaborations between Spain and other countries. In order to span the longest possible period in the analysis, we chose to only plot the network of collaborations of the data extracted from the Scopus database, covering the period from 1996 (the year that Scopus started collecting affiliation data for every author) to 2017. In this interval, we found collaborations with 41 countries, with at least 2 collaborations for 26 of these countries. The countries that have collaborated most frequently with Spain were the United States (42 works), Mexico (15), Italy (14), United Kingdom (11) and Portugal (9).

### Influence and impact indicators

Table 1 presents the values of the total number of documents, total number of citations, citation rate per document

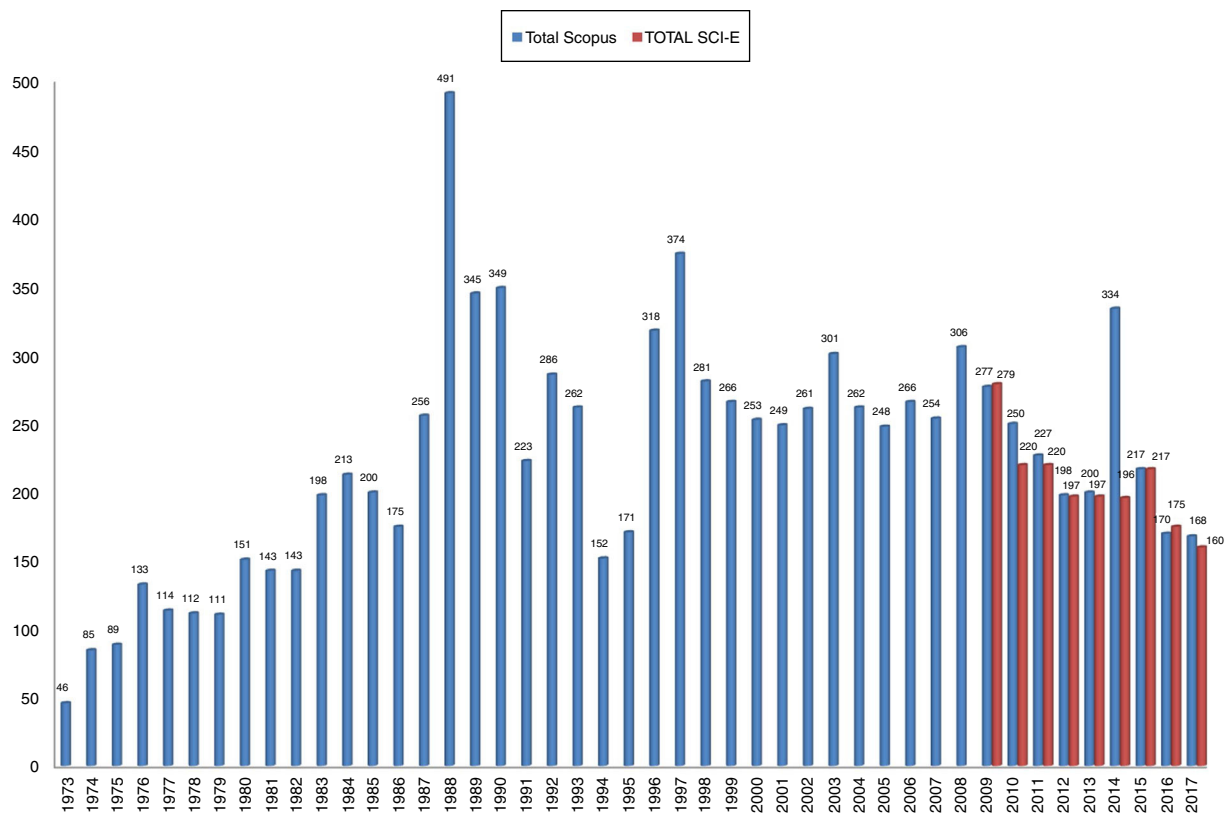


Figure 1 Evolution of the works indexed in Scopus and the SCIE of the Web of Science.

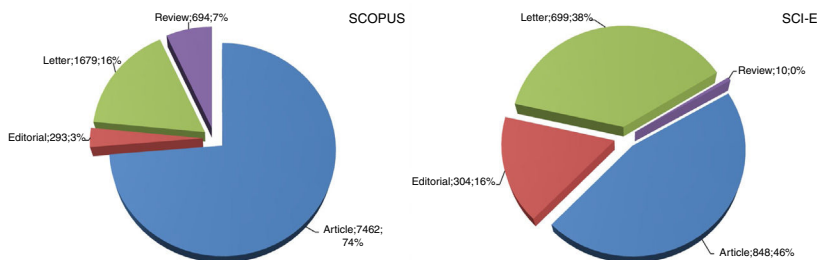


Figure 2 Distribution by type of document of works included in Scopus and the SCIE of the Web of Science.

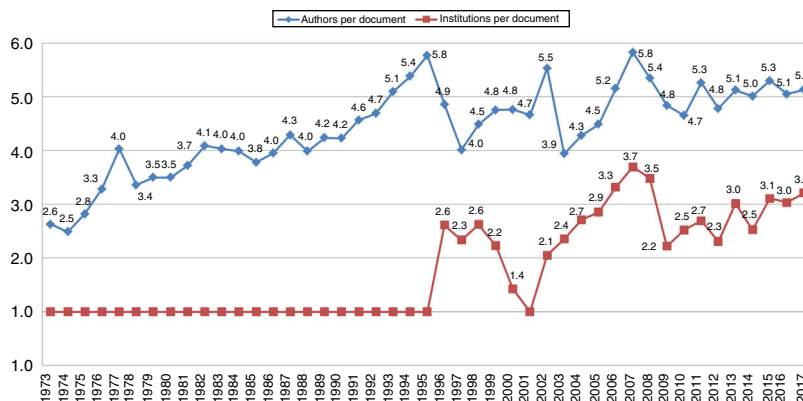


Figure 3 Evolution of the author and institution collaboration indices in Scopus.

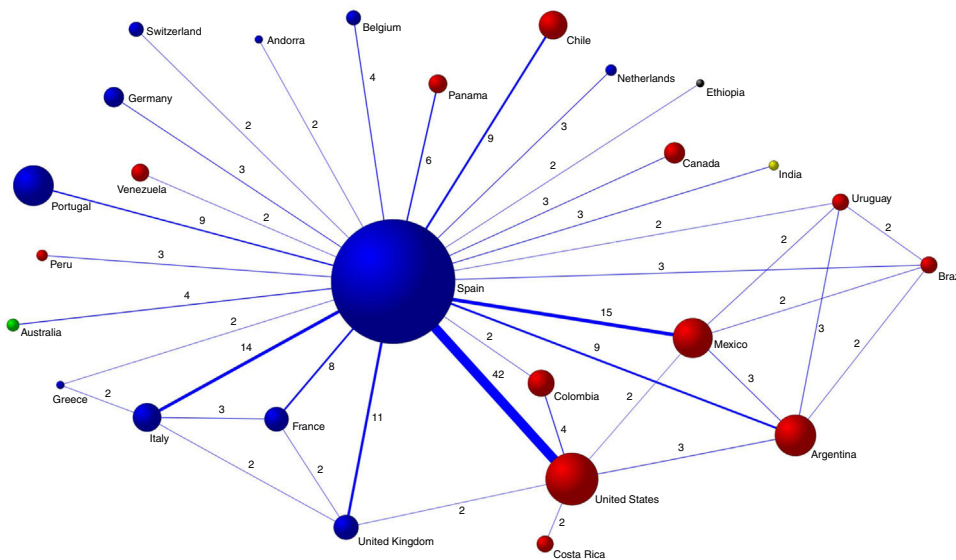


Figure 4 Network of countries that collaborated in the works published in *Anales de Pediatría*.

Table 1 Works, citations and number of citations per work.

Year	Scopus			SCI-Expanded		
	Works	Citations	Citations/work	Works	Citations	Citations/work
2018		410			304	
2017	168	783	4.66	160	507	3.17
2016	170	700	4.12	175	446	2.55
2015	217	619	2.85	217	385	1.77
2014	336	685	2.04	196	362	1.85
2013	200	487	2.44	197	260	1.32
2012	198	430	2.17	197	231	1.17
2011	227	330	1.45	220	192	0.87
2010	250	157	0.63	220	90	0.41
2009	277	37	0.13	279	22	0.08
Total	2043	4638	2.27	1861	2799	1.50

and *h*-index. It is immediately apparent that citation indices are higher in Scopus. For instance, taking 2015 as reference, since it is a year for which both databases have indexed the same number of articles (217), the citation count in Scopus (619) exceeds by 234 the number of citations received in the SCIE (385). Thus, while the number of indexed documents is very similar in both sources, the average number of citations per document is lower in the SCIE database (2.27 in Scopus vs 1.5 in the SCIE). Similarly, the average *h*-index was 18 in Scopus compared to 14 in the SCIE.

Table 2 presents the values for the main citation indices in Scopus and the SCIE. Both the impact factor and the SJR have improved since the journal was included in JCR and Scopus. In the SCIE, the impact factor has increased fourfold in the 9 years *Anales* has been indexed. This index has changed from 0.363 in 2009 to 1.318 in 2017 and continues on an increasing trend. Therefore, the journal ranking has also changed quartiles, moving from the 4th to the 3rd quartile in 2016. In Scopus, the SJR has changed from 0.155 in 1999 to 0.277 in 2017. However, if we analyze its evolution

since 2009, when the journal was first included in the SCIE, this indicator has not increased as much as the impact factor (from 0.235 to 0.277). In the SCIE, the impact factor has also increased fourfold excluding self-citations, while the 5-year impact factor has increased by a factor of 2.6.

The worldwide ranking of *Anales de Pediatría* in the area of pediatrics in the SCIE has improved in the past 5 years, rising from position 102 in 2013 (of 118 journals) to position 83 in 2017 (of 124 journals). This was not the case when we analyzed the Paediatrics, Perinatology and Child Health subject area of Scopus, in which it has gone from position 174 (of 288 journals) to position 180 (of 301 journals).

Table 3 presents the 10 works cited most frequently in Scopus (A) and the SCIE (B). Due to differences in the retrospective coverage of both databases, the most cited articles are not the same in each of them. In Scopus, the most frequently cited (137 citations) is the second part of a cross-sectional study of growth from birth to adulthood published in 2008. This article also corresponds to the highest annual citation rate since its publication (13.7). The first part of



**Table 2** Citation count, impact factor, scientific journal ranking, quartile and ranking of *Anales de Pediatría* in JCR and SJCR.

Year	Science Citation Index Expanded <sup>a</sup>						Scopus <sup>b</sup>				
	Citation count	IF	Ranking	Quartile	IF without self-citations	5-year IF	Citation count	SJR	Ranking	Quartile	Self-citations
2009	338	0.363	89 (94)	Q4	0.260	0.403	432	0.235	161 (279)	Q3	83
2010	554	0.570	94 (108)	Q4	0.370	0.545	429	0.283	152 (279)	Q3	88
2011	627	0.770	94 (115)	Q4	0.510	0.600	463	0.254	168 (275)	Q3	93
2012	694	0.867	91 (121)	Q3	0.615	0.659	387	0.268	159 (281)	Q3	65
2013	678	0.722	102 (118)	Q4	0.545	0.629	316	0.238	174 (288)	Q3	52
2014	750	0.833	104 (120)	Q4	0.593	0.755	347	0.258	174 (293)	Q3	74
2015	748	0.773	106 (120)	Q4	0.530	0.725	292	0.224	188 (295)	Q3	63
2016	827	1.140	88 (121)	Q3	0.876	0.903	322	0.243	185 (299)	Q3	56
2017	1000	1.318	83 (124)	Q3	1.108	1.047	328	0.277	180 (301)	Q3	52

<sup>a</sup> Data obtained from Clarivate Analytics. InCites Journal Citation Reports dataset updated June 06, 2018.

<sup>b</sup> Data obtained from Scimago Lab, Copyright 2007–2018. Scimago Journal & Country Rank.

this study is the third most frequently cited document (64 citations) and corresponds to the second highest annual citation rate since publication (6.4). The second most cited document was about the establishment of cut-off points to identify metabolic syndrome in healthy children applying the HOMA and QUICKI indices (65 citations), and was published in 2007.

The number of citations received by the most cited articles was noticeably smaller in the SCIE, as *Anales de Pediatría* has only been indexed for 9 years. The document cited most frequently (with 34 citations) was titled "Handgrip strength in children and teenagers aged from 6 to 18 years: Reference values and relationship with size and body composition" and was also the document with the highest annual citation rate since its publication (3.78). The second most cited document was a systematic review and meta-analysis evaluating rapid methods for the detection of *Streptococcus pyogenes* (29 citations), was published in 2007 and had an annual citation rate since publication of 3.63. The institution that was involved most frequently in the 10 most cited articles, both in Scopus and the SCIE, was the Hospital Universitario Vall d'Hebron.

## Discussion

Our science metrics research focused on the analysis of the journal *Anales de Pediatría* to quantify its coverage in the SCIE and Scopus and the evolution of its most relevant bibliometric indicators.

The number of works indexed in Scopus in the past 44 years has been inconsistent, with peaks and troughs that can affect trends in indicators. In the 9 years of indexing in the SCIE, we found more consistent indexing that was similar to indexing patterns in Scopus, except for 2014, for which Scopus erroneously indexed works published in different years. Ideally, Scopus will correct these errors, some of which have already affected the scientific literature,<sup>14</sup> for instance in the management of so-called "online-first articles", in the connection of cited works with the citing authors or the duplication of records, among other phenomena.<sup>15–17</sup> These circumstances, which are unrelated to the effectiveness of the editorial strategies of the journal or the quality of its

published contents, can seriously affect indicators, inflating or deflating them.

On the other hand, we noticed that these databases do not always adhere to the classification of documents made by journal by including them in specific sections. We found that some of the documents indexed as articles in Scopus were classified as letters or editorials in the SCIE. In a previous study, Abad et al.<sup>6</sup> found that the proportion of letters in the Spanish pediatrics output was of 19.2%, a proportion that vastly exceeded the global average (7.3%) and that probably resulted from the influence of the letters published in *Anales de Pediatría*, a circumstance that was also noted in 2011 by González Alcaide et al.<sup>4</sup>

The author collaboration index has increased throughout the trajectory of *Anales de Pediatría*. The value of this indicator is influenced by several factors, including the limitation imposed by the journal on the number of signing authors, which have led to a sustained value of this index in contrast with the marked increasing trend that had been observed in previous years.

As we already mentioned, the average number of citations per document is lower in the SCIE (2.27 in Scopus vs 1.5 in the SCIE). This is due to the higher journal coverage of Scopus. Taking into account the area of pediatrics alone, this database indexes 6 Spanish journals. Another study that compared results across several databases (Scopus, Web of Science and Google Scholar) also highlighted the variations in citation counts between databases.<sup>18</sup>

The impact factor and its variants have increased progressively in the SCIE, as have, to a lesser extent, the SJR and the ranking of the journal among journals in its subject area. Should this gradual increase be sustained in upcoming years, the journal would continue climbing the rankings and even enter the second quartile. When it comes to the *h*-index, since the "life" of *Anales de Pediatría* has been much longer in Scopus compared to the SCIE, it was only to be expected that the *h*-index is higher in the former database compared to the latter, as this is an index that increases as journals persist in databases.

The most cited articles of *Anales de Pediatría* provide a perspective of historical developments and insight on the important advances that have occurred in pediatrics, as it

**Table 3** Ten most cited articles.

A. In Scopus					
Authors	Affiliation	Title	Source <sup>a</sup>	Scopus citations	Citations/year
Carrascosa Lezcano, A.; Fernández García, J.M.; Fernández Ramos, C.; Ferrández Longás, A.; López-Siguero, J.P.; Sánchez González, E.; et al.	Hospital Universitario Vall d'Hebron, Universidad Autónoma Barcelona; Hospital Universitario de Granada, Universidad de Granada; Hospital Universitario de Basurto, Fundación Faustino Orbegozo; Hospital Universitario Miguel Servet, Fundación Andrea Prader; Hospital Universitario Carlos Haya, Universidad de Málaga	Spanish cross-sectional growth study 2008. Part II. Height, weight and body mass index values from birth to adulthood	2008; 68(6): 552–569	137	13.70
García Cuartero, B.; García Lacalle, C.; Jiménez Lobo, C.; González Vergaz, A.; Calvo Rey, C.; Alcázar Villar, M.J.; et al.	Hospital Severo Ochoa	The HOMA and QUICKI indexes, and insulin and c-peptide levels in healthy children. Cut off points to identify metabolic syndrome in healthy children	2007; 66(5): 481–490	65	5.91
Carrascosa Lezcano, A.; Ferrández Longás, A.; Yeste Fernández, D.; García-Dihinx Villanova, J.; Romo Montejo, A.; Copil Copil, A.; et al.	Hospital Universitario Vall d'Hebron; Hospital Materno-Infantil Miguel Servet	Spanish cross-sectional growth study 2008. Part I: Weight and height values in newborns of 26–42weeks of gestational age	2008; 68(6): 544–551	64	6.40
Gonzalez De Dios, J.; Moya, M.; Mateos Hernández, M.A.	Hospital Universitario de San Juan, Universidad de Alicante; Hospital Universitario Príncipe de Asturias	Bibliometric indicators: Characteristics and limitations of the analysis of scientific activity	1997; 47(3): 235–244	59	2.81
Carrascosa, A.; Yeste, D.; Copil, A.; Almar, J.; Salcedo, S.; Gussinyé, M.	Hospital Universitario Vall d'Hebron	Anthropometric growth patterns of preterm and full-term newborns (24–42 weeks' gestational age) at the Hospital Materno-Infantil Vall d'Hebron (Barcelona, Spain) 1997–2002	2004; 60(5): 406–416	58	4.14
Hernández Aguilar, M.T.; Aguayo Maldonado, J.	Comité de Lactancia Materna de la Asociación Española de Pediatría; Fundación Micellium	Breastfeeding. How to promote and support breastfeeding in pediatric practice. Recommendations of the Breastfeeding Committee of the Spanish Association of Pediatrics	2005; 63(4): 340–356	50	3.85
Altchek, J.; Nallar, M.; Conca, M.; Biancardi, M.; Freilij, H.	Hospital de Niños Dr. Ricardo Gutiérrez, Buenos Aires (Argentina)	Toxocariasis: Clinical and laboratory features in 54 patients	2003; 58(5): 425–431	48	3.20

Table 3 (Continued)

A. In Scopus					
Authors	Affiliation	Title	Source <sup>a</sup>	Scopus citations	Citations/year
Castillo Laita, J.A.; De Benito Fernández, J.; Escribano Montaner, A.; Fernández Benítez, M.; De La García Rubia, S.; Garde Garde, J.; et al.	Asociación Española de Pediatría de Atención Primaria (AEPap); Sociedad Española de Urgencias de Pediatría (SEUP); Sociedad Española de Neumología Pediátrica (SENP); Sociedad Española de Inmunología Clínica Y Alergia Pediátrica (SEICAP); Sociedad Española de Pediatría Extrahospitalaria y de Atención Primaria (SEPEAP); Universidad de Murcia	Consensus on the treatment of asthma in pediatrics	2007; 67(3): 253–273	47	4.27
Figueras Aloy, J.; Quero, J.; Doménech, E.; López Herrera, M.C.; Izquierdo, I.; Losada, A.; et al.	Hospital Clinic de Barcelona; Universitat de Barcelona; Hospital Universitario La Paz, Universidad Autónoma de Madrid	Recommendations for the prevention of respiratory syncytial virus infections	2005; 63(4): 357–362	43	3.31
Marrodán Serrano, Ma.D.; Mesa Santurino, Ma.S.; Alba Díaz, J.A.; Ambrosio Soblecher, B.; Barrio Caballero, P.A.; Drak Hernández, L.; et al.	Universidad Complutense de Madrid; Centro Nacional de Investigaciones Oncológicas, Instituto de Salud Carlos III; I.E.S. Santa Eugenia	Obesity screening: Updated criteria and their clinical and populational validity	2006; 65(1): 5–14	42	3.50
B. In SCIE					
Authors	Affiliation	Title	Source <sup>a</sup>	SCI-E citations	Citations/year
Serrano, M.D.M.; Collazos, J.F.R.; Romero, S.M.; Santurino, M.S.M.; Armesilla, M.D.C.; del Cerro, J.L.P.; et al.	Universidad Complutense Madrid; Sata Centro Medico Deportivo S.L.; I.E.S. Santa Eugenia	Handgrip strength in children and teenagers aged from 6 to 18 years: Reference values and relationship with size and body composition	2009; 70(4): 340–348	34	3.78
Ruiz-Aragón, J.; López, R.R.; Linde, J.M.M.	Agencia de Evaluación de Tecnologías Sanitarias de Andalucía (AETSA)	Evaluation of rapid methods for detecting Streptococcus pyogenes. Systematic review and meta-analysis	2010; 72(6): 391–402	29	3.63
García-Algar, O.; Combelles, O.V.; Sola, C.P.; Sierra, A.M.; Scaravelli, G.; Pacifici, R.; et al.	Institut Hospital del Mar d'Investigacions Mèdiques (IMIM); Universitat Autònoma de Barcelona (UAB); Istituto Superiore di Sanità (Italia); Universitat de Barcelona	Prenatal exposure to drugs of abuse using meconium analysis in a low socioeconomic population in Barcelona	2009; 70(2): 151–158	25	2.78
Baquero-Artigao, F.	Hospital Universitario La Paz	Consensus document from the Spanish Society of Paediatric Infectious Diseases (SEIP) on the diagnosis and treatment of congenital cytomegalovirus infection	2009; 71(6): 535–547	21	2.33



Table 3 (Continued)

B. In SCIE					
Authors	Affiliation	Title	Source <sup>a</sup>	Scopus citations	Citations/year
Mayordomo-Colunga, J.; Medina, A.; Rey, C.; Arcos, M.L.; Concha, A.; Menéndez, S.	Hospital Universitario Central de Asturias	Success and failure predictors of non-invasive ventilation in acute bronchiolitis	2009; 70(1): 34–39	19	2.11
Manich, A.; Velasco, M.; Joya, X.; García-Lara, N.R.; Pichini, S.; Vall, O.; et al.	Institut Hospital del Mar d'Investigacions Mèdiques (IMIM); Hospital Universitario 12 de Octubre; Istituto Superiore di Sanità (Italia)	Validity of a maternal alcohol consumption questionnaire in detecting prenatal exposure	2012; 76(6): 324–328	19	3.17
Bravo, A.J.B.; Pérez-Yarza, E.G.; de Mercado, P.L.Y.; Perales, A.B.; Vázquez, C.A.D.; Galdo, A.M.	Técnicas Avanzadas de Investigación en Servicios de Salud (TAISS); Hospital Universitario Donostia; Universidad del País Vasco; Complejo Hospitalario Torrecárdenas; Centro de Salud de Moreda; Hospital Universitario Vall d'Hebron	Cost of childhood asthma in Spain: a cost evaluation model based on the prevalence	2011; 74(3): 145–153	16	2.29
Ávila Álvarez A.; García-Alonso, L.; Solar Boga A.; García-Silva, J.	Complejo Hospitalario Universitario de A Coruña	Flexural psoriasis induced by infliximab and adalimumab in a patient with Crohn's disease	2009; 70(3): 278–281	16	1.78
Pérez-Yarza, E.G.; Villa, J.R.; Cobos, N.; Navarro, M.; Salcedo, A.; Martín, C.; et al.	Hospital Universitario Donostia; Hospital Infantil Universitario Niño Jesús; Hospital Universitario Vall d'Hebron; Hospital Universitario Virgen Macarena; Hospital General Universitario Gregorio Marañón; Universitat de Valencia, Hospital Clínico de Valencia; Hospital de Zumárraga; Hospital Clínico San Carlos; Hospital Universitario 12 de Octubre	Forced spirometry in healthy preschool children	2009; 70(1): 3–11	16	1.78
López, C.M.; Silva, L.G.G.; Casero, J.L.; Pérez, J.G.	Hospital General Universitario Gregorio Marañón; Hospital Universitario La Paz; Hospital Infantil Universitario Niño Jesús	Respiratory infections, Down's syndrome and congenital heart disease: The CIVIC 21 study	2009; 71(1): 38–46	15	1.67

<sup>a</sup> Source: We did not include the name of the journal, as it was always *Anales de Pediatría*.

**Table 4** Evolution of bibliometric indicators for *Anales de Pediatría*.*Indicators with a strong increasing trend*

Impact factor  
 5-Year impact factor  
 Impact factor without self-citations  
 Decrease in the annual proportion of self-citations  
 Position in the global ranking in the pediatrics subject area of the JCR

*Indicators with a moderate increasing trend*

Scimago Journal Rank  
 Quartile

*Indicators with an irregular trend*

International collaboration

*Indicators with a decreasing trend*

Number of citations per work

is fair to assume that highly cited articles are those read most times and which are most important within this specialty. The subjects of the most cited articles are varied and usually involve scores or indices, recommendations, consensus documents and childhood diseases. We did not find what Chhapola et al.<sup>19</sup> called "sleeping beauties", that is, articles that go unnoticed (sleep) for a long time and then, seemingly out of the blue, attract considerable attention in the form of citations, which manifests a delay in the recognition of vital work. We also found no evidence of the citation bias toward recent publications postulated by some authors<sup>20</sup> and that could be explained by how easily and quickly these publications may be found using web search engines.

In considering the limitations of the study, we ought to keep in mind that all bibliometric analyses have inherent strengths and weaknesses. The databases considered in our study have great international prestige and provide detailed citation metrics, so they are the sources used most frequently in bibliometric studies, and today, the Web of Science is considered the gold standard in this type of research.<sup>19</sup> Some of the limitations involve the inconsistency or inaccuracy of the records stored in these databases and regarding citations. We also ought to highlight that citation metrics do not necessarily reflect the quality of studies and is not the only method available for the assessment of the impact of research.

To conclude, we ought to underscore that most of the main bibliometric indicators of *Anales de Pediatría* have exhibited an increase, especially the impact factor and its variants (Table 4). We must also highlight the sustained ascension of *Anales* in the ranking of pediatrics journals of the JCR, moving from the fourth to the third quartile in an increasing trend that could bring it to the second quartile in upcoming years. On the other hand, we should strive to increase participation by foreign researchers and institutions, as well as the number of citations. The open-access and bilingual Spanish-English publishing policies promoted from the Editorial Committee may contribute to achieving these goals, as would a diffusion strategy that took into account the visibility of the journal in social networks and

other digital platforms. The data retrieved in our study confirmed that *Anales de Pediatría* has consolidated its leadership as the main vehicle for the diffusion of Spanish pediatrics.

As an interesting project for the future, we propose the establishment of a surveillance body to track the evolution of bibliometric indicators that would guide strategic decision making for the purpose of correcting detected weaknesses or reinforcing existing strengths. Another useful measure would be to analyze the flow of citations from *Anales* to other Spanish and international journals, and from them to *Anales de Pediatría*.

## Conflict of interests

The authors declare that they have no conflicts of interest.

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