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Análise bibliométrica de artigos sobre cirurgia robótica

Bibliometric analysis of articles on robotic surgery

Análise bibliométrica de artigos sobre cirurgia robótica

Jessika Fernandes Tardim de Souza[1]*, Giacomo Miceli Junior[2], Danielle Copello Vaz[3], Ana Luísa Teixeira da Costa Durante[4], Paula de Souza Mota[5], Sarah Goes Barreto da Silva Moreira[6], Andrea dos Santos Garcia[7], Simone Gomes dos Anjos[8], Wander Silvio Leal[9], Carlos Roberto Lyra da Silva[10]

RESUMO

Objetivo: analisar a produção intelectual sobre cirurgia robótica, disponibilizada na base Scopus. **Método:** estudo bibliométrico que abordou a produção registrada eletronicamente em base, de 1992 a 2021, com análise estatística descritiva. **Resultados:** recuperou-se 159 artigos publicados em 119 periódicos. A média de autoria por artigo foi de 0,9. A Enfermagem contribuiu com 42 (26,4%) artigos da área de saúde. Os EUA lideraram com 73 artigos (45,9%). **Conclusão:** os dados apresentados demonstram o baixo nível de interesse da comunidade científico pelo assunto. Não foi possível identificar um grupo de Elite de Autores. Apenas seis países liderados pelos EUA formaram duas Redes de Colaboração. O estudo mostra as limitações da estratificação de periódicos pelo WebQualis ao evidenciar que 33,36% dos periódicos não constam em nenhum estrato Qualis, no entanto, são veículos com alto fator de impacto mensurado por duas métricas distintas, SJR e h index.

Descritores: Enfermagem; Bibliometria; Fator de impacto; Cirurgia robótica; Cirurgia minimamente invasiva e telecirurgia.

ABSTRACT

Objective: to analyze the intellectual production on robotic surgery available on the Scopus database. **Method:** bibliometric study of the production registered electronically in the database from 1992 to 2021, with descriptive statistical analysis. **Results:** 159 articles published in 119 journals were retrieved. The average number of authors per article was 0.9. Nursing contributed 42 (26.4%) articles in the health area. The USA led the way with 73 articles (45.9%). **Conclusion:** the data presented demonstrates the low level of interest in the subject among the scientific community. It was not possible to identify an elite group of authors. Only six countries led by the USA formed two Collaboration Networks. The study shows the limitations of the stratification of journals by WebQualis

[1,3,4] Instituto Nacional do Câncer -INCA. Rio de Janeiro – RJ. * tardimjessika@gmail.com
[2] Hospital Azevedo Lima. Rio de Janeiro – RJ.
[4] Hospital Municipal Souza Aguiar. Rio de Janeiro – RJ.
[5,10] Universidade Federal do estado do Rio de Janeiro. Rio de Janeiro – RJ.
[6] Hospital Maternidade Carmela Dutra
[7] Empresa Pública de Saúde do Rio de Janeiro (RioSaúde). Rio de Janeiro - RJ.
[8] Hospital Universitário Gaffrée e Guinle — HUGG
[9] Secretaria Municipal do Rio de Janeiro - SMS-RJ. Rio de Janeiro – RJ.

by showing that 33.36% of the journals are not in any Qualis stratum, however, they are vehicles with a high impact factor measured by two different metrics, SJR and h index.

Descriptors: Nursing; Bibliometrics; Impact factor; Robotic surgery; Minimally invasive surgery and telesurgery.

RESUMEN

Objetivo: analizar la producción intelectual sobre cirugía robótica disponible en la base de datos Scopus. Método: estudio bibliométrico que analizó la producción registrada electrónicamente en la base de datos desde 1992 hasta 2021, con análisis estadístico descriptivo. **Resultados**: se recuperaron 159 artículos publicados en 119 revistas. La media de autores por artículo fue de 0,9. Enfermería contribuyó con 42 (26,4%) artículos en el área de salud. Estados Unidos encabezó la lista con 73 artículos (45,9%). **Conclusión:** los datos presentados demuestran el escaso interés de la comunidad científica por el tema. No fue posible identificar un grupo de autores de élite. Sólo seis países, encabezados por Estados Unidos, formaron dos redes de colaboración. El estudio muestra las limitaciones de la estratificación de revistas por WebQualis al mostrar que el 33,36% de las revistas no están en ningún estrato Qualis, sin embargo, son vehículos con un alto factor de impacto medido por dos métricas diferentes, SJR e índice h.

Descriptores: Enfermería; Bibliometría; Factor de impacto; Cirugía robótica; Cirugía mínimamente invasiva y telecirugía.

INTRODUCTION

With technological advances, the use of robots in surgical procedures has become an increasingly present reality in the hospital environment. Robotic surgery is a worldwide reality and technological innovations are increasingly present in the surgical environment, with the aim of guaranteeing quality care and safety for the patients involved.[1] In Brazil, this technology has been disseminated as a differential in surgical procedures, with benefits and advantages aimed at more precise, less invasive surgery, with a significant reduction in perioperative bleeding, less pain and a lower risk of infection. This contributes to a post- operativeless painful and a faster recovery, consequently with a shorter hospital stay for the patient.[1-2]

Robotic surgery is currently referred to as the evolution of minimally invasive laparoscopic surgery, where the surgeon, through small incisions and laparoscopic accesses, introduces the optics, robotic forceps and working instruments inside the patient's body, relying on the precise safe movements of the robotic arms. But the robot doesn't do anything on its own; all command and movement is carried out by the surgeon via the surgeon's console, where the

robot accurately reproduces the movements made by the surgeon's hands, filtering out tremors, the result of the enlarged articulation of the endowrist instrument, which allows movements t h a t transcend the limitations of human wrist movement and 3D HD imaging, making surgical and clinical results more efficient.

It features multi-jointed instruments with 7 degrees of freedom, including insertion movements, external yaw, external tilt, rolling, internal yaw, internal tilt and grip. It features tremor filtering, one of the technology's differentials, eliminating the physiological tremor of the surgeon's hand.[4]

The da Vinci robotic system, named after the painter and philosopher Leonardo Da Vinci, is made up of 3 main components: the robot, with its 4 robotic arms, where the optics and the most varied tweezers specific to each surgery are inserted. The surgeon's console, which provides the surgeon with a high-definition image in three dimensions, with a visual response of the surgical field, allowing the surgeon to sit and position his head ergonomically, making it more comfortable for long surgeries. And a third component: the external video tower, called the image system (Incite Visual System), which has a touchscreen monitor that allows adjustments and control of audio and video parameters, is where the light source for the endoscope is located via optical fiber with high-definition image, all the cables and resources of the system are connected to this tower.

Today, there are already 4 generations of da Vinci systems based on learning from for more than two decades, marketed by Intuitive, the company that holds the patent for the system. It began with the da Vinci system, followed by the da Vinci S, da Vinci Si and the most modern system on the market, the da Vinci Xi. With different technological pillars, such as 3D HD vision, high definition and magnification of the original image by up to 10 to 15 times, intuitive movement, training and control.

The first documented use of a robot-assisted surgical technique took place in 1985, when the PUMA robotic arm was used in a delicate neurosurgery biopsy. 560. The following year, the same PUMA system was used to perform a transurethral resection. In 1990, the AESOP system produced by Computer Motion became the first system approved by the Food and Drug Administration (FDA) for its endoscopic surgical procedure.[4-5]

This technology has been present in Brazil since 2008, and there are currently 77

robotic platforms in the country, located mainly in the southeast. The first robotic surgeries were carried out in the state of São Paulo, which currently dominates the market with 35 robotic platforms, followed by the State of Rio de Janeiro with 14 platforms.[5-6]

As this technology is still not very widespread in Brazil, it is very likely that the production of knowledge on the subject is still in a solidification phase in the academic world, which can be verified through bibliometric studies. Therefore, the state of the art of research into robotic surgery could benefit from bibliometric studies such as this one.

Bibliometric analysis, which involves the application of statistics to bibliography, has three classically recognized laws: Bradford's Law (law of dispersion of scientific knowledge), Lotka's Law (law of productivity of authors) and Zipf's Law (frequency of words). It is worth noting that the main difference between bibliography and bibliometrics is that the latter uses mainly quantitative rather than discursive methods, which gives greater objectivity to the evaluation of scientific production.[4]

Bibliometrics is not only concerned with the quantitative aspect. It is also concerned with verifying the relevance and impact of authors, journals, institutions, groups or countries in the most diverse areas of knowledge.[4-5]

Bibliometric studies are based on a set of empirical laws and principles from information science, whose aim is to investigate the quantitative aspects of the production, dissemination and use of available and recorded information, thus contributing to the evaluation of the current state of science, as well as research management.[5-7]

This research is justified by the fact that it investigates the characteristics of intellectual production about robotic surgery and could contribute to other health researchers or researchers in associated areas, as it will show the distribution of production over time, by geographical area and by area of knowledge, the impact of journals, the most productive authors, among other aspects. Therefore, the question we intend to answer in this study is: is the level of productivity of authors and journals on robotic surgery correlated with the bibliometric laws and principles of intellectual production of authorship and publication?

To answer this question using bibliometric metrics, the aim is to analyze the intellectual production on robotic surgery available on the Scopus database.

METHODOLOGY

This bibliometric study looked at the production/dissemination and use of information recorded electronically in an international database, published between 1969 and 2018. The principle of bibliometrics comprises the use of reliable indicators, which can be defined as parameters used in evaluation processes.[5]

The searches were carried out in the Scopus database in May 2021, using the descriptors [robotic surgery] and [nursing] and as a filter "article title, abstract and keywords". Scopus was chosen because of its acceptance in the national and international scientific community, especially around health, which provides abstracts and citations of peer-reviewed scientific literature, as well as offering a more comprehensive view of the world's research output.

The descriptive analysis of the distribution of journals and authorship was processed using the R software program®, considering a significance level of 5% (p-value = 0.05). Bivariate analysis was carried out to compare the bibliometric behavior of journals, their areas of publication and Qualis stratification. Bibliometrix software was used to calculate the strength of the links established between authors and co-authors, as well as geographical areas, represented in map form.

RESULTS

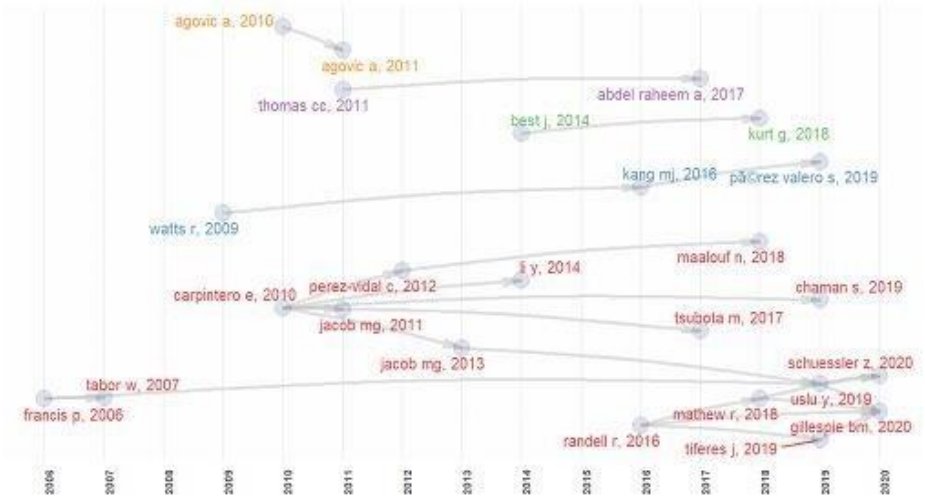
The search returned 159 documents published between 1992 and 2021, with an annual growth rate of 2.93%. The last 5 years accounted for 68 (42.7%) of the publications. These documents are published in 120 sources, the average number of publications per year was 7.37, the average number of citations per document was 10.96, the average number of citations per year per document was 1,347, 3,207 references were reported, all distributed in 99 articles, two books, 3 book chapters, 26 conference papers, one conference review, two editorials, one erratum and 25 reviews. There were 1,527 identifying keywords and 342 author keywords. The total number of authorship/co-authorship was 571, while 33 were single authorship. Documents per author was 0.278, authors per document 3.59, co-authors per documents 3.89 and the collaboration index was 4.3. The most productive author published 5 articles. Table 1 shows the distribution of production according to Lotka's Law. Figure 1 shows the history of the direct citation network between authors.

Table 1 - Lotka's Law

Written document s	No. of authors	Proportion of Authors
1	535	0,937
2	29	0,051
3	3	0,005
4	3	0,005
5	1	0,002

Source: Research data. Rio de Janeiro, 2021.

Figure 1 - History of the direct citation network



Source: Research data. Rio de Janeiro, 2021.

The geographical distribution of the publications retrieved shows the absolute leadership of the United States of America - USA with 52 documents (53%), followed by the United Kingdom with 8 (8%) of the publications, with Brazil occupying 12th^{o} place with 1 document (1%). ^{o}An analysis of the geographical relevance of the 20 countries with production shows that Brazil, even with only 1 published document, is in 10th place with 10 citations. Figure 2 shows the geographical distribution of this relevance. The five most productive institutions were Purdue University and Western University, both with 12 documents, followed by the University of Rochester (10), the University of Pittsburgh Medical Center (9) and the City of Hope National Cancer Center (8).

Figure 2 - Geographic distribution of production by citation relevance

Order	Countries	Citations	Average citations

1	USA	814	15,65
2	Netherlands	301	150,50
3	UK	152	19,00
4	Belgium	93	46,50
5	Spain	32	8,00
6	Japan	24	4,80
7	Lebanon	15	15,00
8	Australia	12	2,40
9	Korea	12	6,00
10	Brazil	10	10,00
11	Estonia	5	5,00
12	Türkiye	5	2,50
13	Canada	4	4,00
14	Denmark	4	1,33
15	Ireland	4	4,00
16	China	3	0,75
17	Germany	1	1,00
18	India	1	1,00
19	Qatar	1	1,00
20	Sweden	1	1,00

Source: Research data. Rio de Janeiro, 2021.

Table 3 summarizes the Bradford Table, with the distribution of journals and their output. It was constructed considering the number of journals (N. Journals) required to publish a given number of articles (N. Articles).

Table 1 - Bradford table

Journal	Rank	Production	Σ Production	Zone
AORN journal	1	16	16	zone 1
Urologic nursing : official journal of the american urological association allied	2	6	22	zone 1
Journal of endourology	3	3	25	zone 1
AANA journal	4	2	27	zone 1
ACM international conference proceeding series	5	2	29	zone 1
BJU international	6	2	31	zone 1
Cochrane database of systematic reviews	7	2	33	zone 1
Industrial robot	8	2	35	zone 1
International braz j urol	9	2	37	zone 1
International journal of medical robotics and computer assisted surgery	10	2	39	zone 1
Journal of clinical nursing	11	2	41	zone 1
Journal of nursing scholarship	12	2	43	zone 1
Journal of perianesthesia nursing	13	2	45	zone 1
Journal of perioperative practice	14	2	47	zone 1
Journal of thoracic disease	15	2	49	zone 1
Lecture notes in computer science (including subseries lecture notes in artificial intelligence	16	2	51	zone 1

and lecture notes in bioinformatics)				
Progress in biomedical optics and imaging - proceedings of spie	17	2	53	zone 1
Seminars in colon and rectal surgery	18	2	55	zone 2
Surgical endoscopy	19	2	57	zone 2
Urologic nursing	20	2	59	zone 2
18th mediterranean conference on control and automation, med'10 - conference proceedings	21	1	60	zone 2
2008 10th international conference on control, automation, robotics and vision, icarcv 2008	22	1	61	zone 2
2010 3rd ieee ras and embs international conference on biomedical robotics and biomechatronics, biorob 2010	23	1	62	zone 2
Acta obstetricia et gynecologica scandinavica	24	1	63	zone 2
Advanced robotics	25	1	64	zone 2
Advances in intelligent systems and computing	26	1	65	zone 2
American journal of managed care	27	1	66	zone 2
American journal of obstetrics and gynecology	28	1	67	zone 2
American surgeon	29	1	68	zone 2
Anesthesia in thoracic surgery: changes of paradigms	30	1	69	zone 2
Annals of cardiothoracic surgery	31	1	70	zone 2
Annals of surgical treatment and research	32	1	71	zone 2
Applied ergonomics	33	1	72	zone 2
Applied nursing research	34	1	73	zone 2
Arab journal of urology	35	1	74	zone 2
Asian journal of surgery	36	1	75	zone 2
Asian journal of urology	37	1	76	zone 2
Asme 2012 11th biennial conference on engineering systems design and analysis, esda 2012	38	1	77	zone 2
Australian health review	39	1	78	zone 2
Autonomous robots	40	1	79	zone 2
Best practice and research: clinical gastroenterology	41	1	80	zone 2
Canadian journal of urology	42	1	81	zone 2
Cancer journal (united states)	43	1	82	zone 2
Cancer nursing	44	1	83	zone 2
Case reports in medicine	45	1	84	zone 2
Chinese journal of lung cancer	46	1	85	zone 2
Chirurg	47	1	86	zone 2
Chirurgia (bucharest, romania : 1990)	48	1	87	zone 2
Cin - computers informatics nursing	49	1	88	zone 2
Clinics	50	1	89	zone 2
Cognition, technology and work	51	1	90	zone 2
Communications in computer and information	52	1	91	zone 2

science				
Communications of the acm	53	1	92	zone 2
Computer-assisted surgery: new developments, applications and potential hazards	54	1	93	zone 2
Conference proceedings - ieee international conference on systems, man and cybernetics	55	1	94	zone 2
Data science for healthcare: methodologies and applications	56	1	95	zone 2
Ergonomics	57	1	96	zone 2
European journal of oncology nursing	58	1	97	zone 2
Female pelvic medicine and reconstructive surgery	59	1	98	zone 2
Gastroenterology nursing	60	1	99	zone 2
Gynecologic oncology	61	1	100	zone 2
Healthcare informatics : the business magazine for information and communication systems	62	1	101	zone 2
HPB	63	1	102	zone 2
Human factors	64	1	103	zone 2
IEEE international conference on intelligent robots and systems	65	1	104	zone 2
Ifac-papersonline	66	1	105	zone 2
ifac proceedings volumes (ifac-papersonline)	67	1	106	zone 2
Index de enfermeria	68	1	107	zone 2
Indian journal of public health research and development	69	1	108	zone 3
Innovations: technology and techniques in cardiothoracic and vascular surgery	70	1	109	zone 3
Inter bloc	71	1	110	zone 3
International journal of nursing studies	72	1	111	zone 3
JAMA - journal of the american medical association	73	1	112	zone 3
Japanese journal of anesthesiology	74	1	113	zone 3
JOGNN - journal of obstetric, gynecologic, and neonatal nursing	75	1	114	zone 3
Jornal brasileiro de pneumologia	76	1	115	zone 3
Journal of central south university (medical sciences)	77	1	116	zone 3
Journal of holistic nursing	78	1	117	zone 3
Journal of innovation in health informatics	79	1	118	zone 3
Journal of minimally invasive gynecology	80	1	119	zone 3
Journal of neurosurgery: pediatrics	81	1	120	zone 3
Journal of otolaryngology - head and neck surgery	82	1	121	zone 3
Journal of robotic surgery	83	1	122	zone 3
Journal of surgical education	84	1	123	zone 3
Journal of surgical research	85	1	124	zone 3

Lecture notes of the institute for computer sciences, social-informatics and telecommunications engineering, lnicst	86	1	125	zone 3
Medsurg nursing	87	1	126	zone 3
Minerva urologica e nefrologica	88	1	127	zone 3
Nursing	89	1	128	zone 3
Nursing clinics of north america	90	1	129	zone 3
Nursing management	91	1	130	zone 3
Obstetrical and gynecological survey	92	1	131	zone 3
Orl-head and neck nursing: official journal of the society of otorhinolaryngology and head-neck nurses	93	1	132	zone 3
Patient safety in surgery	94	1	133	zone 3
Perioperative nursing clinics	95	1	134	zone 3
Plos one	96	1	135	zone 3
Proceedings - fifteenth ieee international conference and workshops on the engineering of computer-based systems, ecbs 2008	97	1	136	zone 3
Proceedings - ieee international conference on robotics and automation	98	1	137	zone 3
Proceedings of spie - the international society for optical engineering	99	1	138	zone 3
Proceedings of the 2005 ieee 9th international conference on rehabilitation robotics	100	1	139	zone 3
Proceedings of the 2nd international conference on intelligent computing and control systems, iciccs 2018	101	1	140	zone 3
Proceedings of the annual international conference of the ieee engineering in medicine and biology society, embs	102	1	141	zone 3
Radical prostatectomy: surgical perspectives	103	1	142	zone 3
Revista brasileira de enfermagem	104	1	143	zone 3
Ro-man 2017 - 26th ieee international symposium on robot and human interactive communication	105	1	144	zone 3
Robotic renal surgery: benign and cancer surgery for the kidneys and ureters	106	1	145	zone 3
Robotics and autonomous systems	107	1	146	zone 3
Seminars in oncology nursing	108	1	147	zone 3
Studies in health technology and informatics	109	1	148	zone 3
Supportive care in cancer	110	1	149	zone 3
Surgery (united states)	111	1	150	zone 3
Surgical clinics of north america	112	1	151	zone 3
Telemedicine and e-health	113	1	152	zone 3
The pennsylvania nurse	114	1	153	zone 3
Urologic nursing: official Journal of the american urological association allied	115	1	154	zone 3

Urology	116	1	155	zone 3
Video-assisted thoracic surgery	117	1	156	zone 3
World journal of surgery	118	1	157	zone 3
World neurosurgery	119	1	158	zone 3
Zhonghua wei chang wai ke za zhi chinese journal of gastrointestinal surgery	120	1	159	zone 3

Source: Research data. Rio de Janeiro, 2021.

Table 2 shows the comparison of the theoretical calculation with the empirical findings. The production of journals was divided into three Zones, each containing 1/3 of the total 213 articles, so Y, which represents the number of journals in the 1st Zone, was equal to 9.

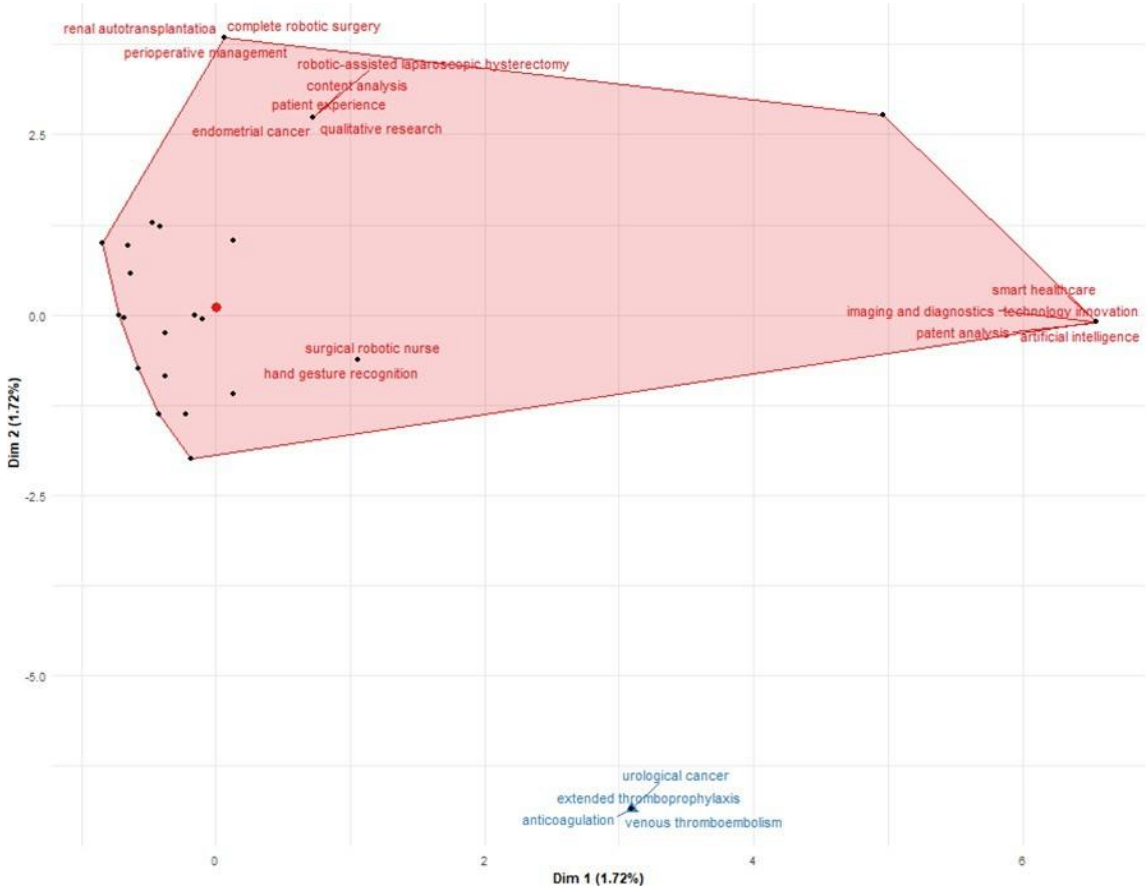
Table 2 - Theoretical calculation and empirical findings in the Bradford Zones.

	Theoretical Calculation		**Empirical Calculation**		
Zones	**Total articles**	**N periodicals**	**Total articles**	**N periodicals**	**Online**
1ª	71	6	56	6	Não
2ª	71	18	66	26	Não
3ª	71	108	91	91	Não

Source: Research data. Rio de Janeiro, 2021.

As for the conceptual structure, using the keywords, Zipf's Law showed that the words: minimally invasive surgery, laparoscopy, patient safety, quality of life, teamwork, perioperative nursing, thoracic surgery, laparoscopic surgery, robotic surgical procedures, robotic-assisted laparoscopic surgery, cystectomy, communication and robot are words that correlate with the terms used in the search. Figure 1 shows the conceptual structure map of the words used in the retrieved documents.

Figure 1 - Map of the conceptual structure of words



Source: Research data. Rio de Janeiro, 2021.

DISCUSSION

After these analyses, it can be seen that the research corpus is consistent, as data mining allowed documents to be retrieved based on the main descriptors, delimiting the subject that was the focus of the research.

There was a sustained increase in publications from 2002 onwards, with 2013 having the highest number of publications, but even so, the productivity of the journals was very irregular and dispersed. The average productivity was 4.953 articles per year, with a standard deviation of 4.634.

It was also possible to see a low level of productivity on the part of the 160 authors. On the other hand, the average number of co-authors, 5.45, was within the average allowed in most national and international journals, of a maximum of six authors per article.

It is quite reasonable to infer that the low rate of co-authorship is most likely due to the low relevance of the subject in scientific publications and this finding is reinforced when calculating the √n (square root) of the number of authors (n), as recommended by Lotka and Price's Law to identify the Elite group in the production of articles on a given topic/subject.

The figure found was approximately 12 authors. For there to be an established Elite group, the Law of Elitism (Lotka/Price)[5] determines that the members belonging to this group must produce at least 50% of the publications, in this study, the equivalent of approximately 106 articles, however, the empirical data reveals that the first 12 authors, who would theoretically be part of the Elite, published only 26 articles, which represents only 12% of the publications.

In this case, the failure to determine an Elite Group in the empirical data stems from the high number of occasional authors, which may strongly indicate weak consolidation of the topic with the specific area of pediatrics or a state of obsolescence, since the study considered 49 years of production - 1969-2018.

The analysis of co-authorship makes it possible to verify scientific collaboration, which is one of the most researched attributes in the use of Social Network Analysis (SNA), as it provides the researcher with a broad view of the invisible colleges in which the vertices of the research are immersed, as well as a series of other findings regarding the relationships within the scientific sphere.[6-7]

In this respect, when we compare the average number of co-authorships with the institutions and countries of origin, we can see that Social Networks in the scientific field are limited to authors whose affiliation is the same for the most part, with the exception of the United States of America, the United Kingdom, Canada and Germany, which together formed the largest inter-country collaboration network, followed by Australia and France.[8-10]

The language of the publications was dominated by English. This dominance can easily be explained by the fact that English is a universal language for science.

Brazil is the only country in Latin America which, like other countries, has no networks and is totally isolated. This finding allows us to safely infer that the level of international interaction of Brazilian researchers, and those of the other countries that have not formed networks/links, even after 49 years 1969-2018, is still very fragile.

The average number of documents published per institution was 2.69, which seems to be a very low average when you consider the time frame studied. Therefore, there was no institution

that stood out quantitatively.

Applying Bradford's Law to verify the behavior of the distribution/dispersion of journals, the statement of which is: by constructing a table in descending order of the production of journals on a given topic, it will be possible to distinguish a core of journals more dedicated to the topic studied and several groups/zones with the same number of articles as the core, but with a greater number of journals in the proportion o f : (Zone 1 = Y), (Zone 2 = 3Y) and (Zone 3 = 3Y).[2]

Tables 1 and 2 show that in none of the three Zones is t h e empirical data compatible with the theoretical model and therefore not in line with the behavior of Bradford's theoretical model. The Pediatrics title was the most productive, with 30 articles (14.08%) of the documents retrieved, proving its specificity on the subject of CVP. It is possible to infer that there was a dispersion of production, which may indicate that the subject studied is of little interest in research and/or scientific publication.

Of the 123 journals, 40 (33.36%) are not stratified in WebQualis, however, they are journals with significant SJR - Scimago Journal Report for the health area, such as Anaesthesia, third in the ranking of journals most devoted to the subject studied, with 5 articles published, SJR of 1.319 and h index of 97. It is therefore an important scientific vehicle but has not yet received any articles from Brazilian stricto sensu postgraduate programs and has therefore not yet been stratified.

In stratum A1 there are 21 (17.07%) journals, in A2 there are 16 (13%), in B1 21 (17.07%), B2 19 (15.44), B3 five (4.06%), and finally B4 with just one (0.8%). No journals were found in the B5 or C strata. This data shows that despite the low productivity, the articles are published in well-rated journals, which may raise the hypothesis that the low number of articles on CVP may be related to the low quality of the articles, i.e. they are submitted but not recommended for publication.

Nursing concentrates its production in A1 and A2 extracts, while Medicine, in B2 and B1, which can be explained by the differences between the two areas when they establish their criteria for classifying their journals, despite this fact, it cannot be denied that the production found in nursing is admitted to be of high quality, which was proven in the stratification of Qualis, SJR and h index of the journals.

Considering the length of time the topic has been registered on the Scopus database, it is possible to infer that the subject has already reached maturity and is in a state of production

obsolescence, perhaps because it no longer has the interest of the scientific community and/or journals, despite the fact that some are extremely specific, but nevertheless do not have a considerable amount of production that can demonstrate the importance/relevance of the subject.

CONCLUSION

The study analyzed 213 articles retrieved from the Scopus database and published in 123 journals from 1969-2018, the vast majority of which were international, with only two national articles, the Brazilian Journal of Nursing (OBJN/UFF) and the Revista Latino- Americana de Enfermagem (SP), which may indicate the low productivity of Brazilian researchers on CVP.

It was possible to show the evolution of the number of publications over 49 years, the origin of the articles, which journals have published the most on the subject, their CAPES classification, impact factor and geographical location.

As for the authors, the study highlighted the journal that published their research, t h e institution to which they are linked and their geographical location. In this respect, it is clear that the subject does not seem to interest researchers to the point of setting up inter-country and inter-institution collaboration networks.

Although based on empirical facts, Bradford and Lotka's laws were able in this study to confirm possible theoretical hypotheses that the core of journals is made up of the most devoted and, therefore, most productive authors, it nevertheless revealed that the more specific the subject/theme, the more limited the possibility of identifying elite groups of authors.

The study shows the limitations of the stratification of journals by WebQualis by showing that 33.36% of the journals are not in any Qualis stratum, however, they are vehicles with a high impact factor measured by two different metrics, SJR and h index.

Another important aspect that needs to be considered is the cognitive institutionalization of the areas of knowledge in the domain of the articles and journals retrieved, which could be identified using the three descriptors used. Despite the grammatical standardization of the descriptors by a controlled vocabulary - CEDs, the fact that unreliable inferences were made may still be a limitation of this study.

As a contribution, the results of the study and its methodological design could serve as a basis for other propositions, thus filling a gap in bibliometric research in nursing.

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