

## SCIENTIFIC PRODUCTION OF NURSING ON MATERIAL AND STERILIZATION CENTER: A BIBLIOMETRIC STUDY

Produção de enfermagem em centro de material e esterilização: estudo bibliométrico

Producción de enfermería en centro de material y esterilización: estudio bibliométrico

Cintia Silva Fassarella<sup>1\*</sup>; Isabela da Rosa Noronha<sup>2</sup>; Isabele da Rosa Noronha<sup>3</sup>; Aline Affonso Luna<sup>4</sup>; Flavia Giron Camerini<sup>5</sup>

### How to quote this article:

Fassarella CS, Noronha IR, Noronha IR, et al . SCIENTIFIC PRODUCTION OF NURSING ON MATERIAL AND STERILIZATION CENTER: A BIBLIOMETRIC STUDY. Rev Fun Care Online. 2021. Jan./Dec.; 13:829-835. DOI: <http://dx.doi.org/10.9789/2175-5361.rpcfo.v13.8220>

### ABSTRACT

**Objective:** This study sought to identify the studies on Material and Sterilization Center carried out by nurses and published in highly qualified Brazilian journals (A1, A2, B1, and B2 according to the Qualis system). **Methods:** this descriptive, retrospective, bibliometric study with a quantitative approach was performed by selecting scientific articles published in highly qualified Brazilian journals from 1973 to 2017. **Results:** considering the 286 articles identified, 108 met the inclusion criteria. There was a predominance of articles having Graziano as one of the authors (18.52%), evaluation of sterilization quality as the object of study (24.08%). Also, most articles employed a quantitative approach (58.33%) and selected the nursing team as the target population (51.85%). **Conclusion:** the scientific production on Material and Sterilization Center has advanced in the last decades in Brazil. Nevertheless, there is a need to conduct further research on this subject, especially involving good practices and technological advances available in this field.

**Descriptors:** Sterilization, Nursing, Bibliometrics.

<sup>1</sup> Nursing graduate by the *Universidade do Grande Rio (UNIGRANRIO)*, PhD in International Co-Guardianship in Nursing Sciences by the *Universidade do Porto*, PhD in Nursing by the *UERJ*, Adjunct Professor at *UNIGRANRIO*, Assistant Professor at *UERJ. Universidade do Estado do Rio de Janeiro (UERJ)*, Brazil.

<sup>2</sup> Nursing undergraduate student at *UERJ. Universidade do Estado do Rio de Janeiro (UERJ)*, Brazil.

<sup>3</sup> Nursing graduate by the *UERJ*, Resident Oncology Nurse at *INCA. Instituto Nacional de Câncer (INCA)*, Brazil.

<sup>4</sup> Nursing graduate by the *UNIGRANRIO*, PhD in Sciences by the *UNIRIO*, Adjunct Professor at *UNIRIO. Universidade Federal do Estado do Rio de Janeiro (UNIRIO)*, Brazil.

<sup>5</sup> Nursing graduate by the *Universidade Federal do Rio de Janeiro (UFRJ)*, PhD in Nursing by the *UERJ*, Adjunct Professor at *UERJ. Universidade do Estado do Rio de Janeiro (UERJ)*, Brazil.

## RESUMO

**Objetivo:** Identificar a produção científica em revistas brasileiras com Qualis A1, A2, B1 e B2 sobre Centro de Material e Esterilização. **Método:** estudo descritivo, retrospectivo e quantitativo, do tipo bibliométrico. Foram selecionados artigos científicos disponíveis no período de 1973 a 2017, publicados em revistas científicas brasileiras, com classificação no Qualis A1, A2, B1 e B2. **Resultados:** dos 286 artigos identificados, 108 atenderam aos critérios de inclusão. Houve predomínio da investigadora Graziano 20 (18,52%), do objeto de estudo sobre qualidade de esterilização 26 (24,08%), da abordagem metodológica quantitativa 63 (58,33%), e da população-alvo mais estudada foi à equipe de enfermagem 56 (51,85%). **Conclusão:** a produção científica brasileira em Centro de Material e Esterilização avançou nas últimas décadas, no entanto ainda carece de produção científica, especialmente relacionada às boas práticas e aos avanços tecnológicos disponíveis na área.

**Descritores:** Esterilização, Enfermagem, Bibliometria.

## RESUMEN

**Objetivo:** Identificar la producción científica en revistas brasileñas con Qualis A1, A2, B1 y B2 sobre Centro de Material y Esterilización. **Método:** estudio descriptivo, retrospectivo y cuantitativo, del tipo bibliométrico. Se seleccionaron artículos científicos disponibles en el período de 1973 a 2017, publicados en revistas científicas brasileñas, con clasificación en el Qualis A1, A2, B1 y B2. **Resultados:** de los 286 artículos identificados, 108 atendieron a los criterios de inclusión. Se observó un predominio de la investigadora Graziano 20 (18,52%), del objeto de estudio sobre calidad de esterilización 26 (24,08%), del abordaje metodológico cuantitativo 63 (58,33%), y de la población objetivo más estudiada equipo de enfermería 56 (51,85%). **Conclusión:** la producción científica brasileña en Centro de Material y Esterilización avanzó en las últimas décadas, sin embargo todavía carece de producción científica, especialmente relacionada a las buenas prácticas ya los avances tecnológicos disponibles en el área.

**Descriptor:** Esterilización, Enfermería, Bibliometría.

## INTRODUCTION

The Material and Sterilization Center (MSC) is a functional unit intended for the processing of Health Care Products (HCPs). It deals with reception, cleaning, drying, integrity and functionality evaluation, preparation, disinfection or sterilization, storage, and distribution.<sup>1</sup> The MSC is present in health care facilities that have an operating room, an obstetric center, a hemodynamic unit, and an emergency unit of high complexity and urgency.<sup>2</sup>

MSC's professional team consists of nurses, nurse technicians and/or auxiliary nurses. According to Resolution 424 of the Brazilian Federal Nursing Council (COFEN), the Nurse Coordinator or the person in charge of the MSC is responsible for planning, coordinating, executing, monitoring, and assessing all stages related to HCP processing; developing a Standard Operating Procedure (SOP) for each stage of HCP processing; providing a quality assessment of the products supplied by an outsourced processing company, when applicable; enforcing the use of personal protection equipment (PPE); defining the required qualification, training, permanent education, and performance assessment of the professionals

working in the MSC.<sup>3</sup>

This nursing sector usually has low visibility compared to the relevance of the activity. This work, in general, aims at preventing infections and requires professional coordination among science, technology, quality, and patient safety.<sup>4</sup> The good functioning of the MSC minimizes risks and damage to the surgical patient.<sup>5</sup>

The motivation for carrying out this research emerged from professional and academic concerns, as there was empirically little interest in conducting studies addressing MSCs. The concern for identifying studies on this subject carried out by nurses may contribute to making future choices regarding specific and practice-focused research on MSC.

Hence, the following research questions were developed as follows: “what studies on MSC carried out by nurses can be found in highly qualified Brazilian journals (A1, A2, B1, and B2 according to the Qualis system)?”; “what are the main goals of these studies?”; and “what are their types and which population was used for collecting data?”

Considering the above questions, this study sought to identify the studies on MSC carried out by nurses and published in highly qualified Brazilian journals

## METHODS

This bibliometric, descriptive, retrospective study was performed through documental research. Bibliometrics is a technique that emerged at the beginning of the 20<sup>th</sup> century as a response to the need to evaluate the production and scientific communication. It is important because it allows the counting of studies according to authors, published institution, country, and citations, thus being able to measure their impact on the scientific community.<sup>6</sup>

The indicators obtained through a bibliometric database are based on a comparative approach, serving as tools to describe and express scientific issues. The use of bibliometric analysis in scientific research is based on the investigation of the behavior of knowledge and literature as part of communication. Although the application of bibliometrics to Information Science has been widely known, it can be applied to several areas of knowledge in order to identify the impact of studies on a certain field of knowledge and the production and productivity of a set of researchers through the use of bibliometric indicators.<sup>6</sup>

For data analysis, articles were selected from highly qualified Brazilian journals. The *Revista Latino Americana de Enfermagem* (RLAE) was the only Qualis A1 journal searched. *Revista Brasileira de Enfermagem* (REBEn), *Revista da Escola de Enfermagem da USP* (REEUSP), *ACTA Paulista* (Acta Paulista Enferm), *Revista Texto & Contexto Enfermagem* (Rev. Texto & Contexto), *Revista de Saúde Pública Online* (Rev. Saúde PublOnline), and *Cadernos de Saúde Pública* were the Qualis A2 journals searched. *Interface - Comunicação, Saúde, Educação*; *Revista Gaúcha*

de Enfermagem (RGE); *Cogitare Enfermagem* (Cogitare Enferm.); *Escola Anna Nery Revista de Enfermagem* (Esc Anna Nery); *Revista da Rede de Enfermagem do Nordeste* (Rev Rene); *Revista Eletrônica de Enfermagem* (Rev. Elet. Enf.); *Revista Enfermagem UERJ* (Rev enferm UERJ); *Revista Mineira de Enfermagem* (REME); and *Online Brazilian Journal of Nursing* (Online Braz J Nurs.) were the Qualis B1 journal searched. Finally, *Revista Ciência Cuidado e Saúde* (Cienc Cuid Saude), *Revista Enfermagem Brasil*, *Revista Enfermagem em Foco* (Enferm. Foco), *Revista Baiana de Enfermagem* (RBE), *Revista de Enfermagem da UFSM*, *Revista de Enfermagem da UFPE* (REUOL), *Revista de Enfermagem do Centro Oeste Mineiro* (RECOM), and *Revista Online de Pesquisa Cuidado é Fundamental* (J. res. fundam. care online) were the Qualis B2 journal searched. These comprise a total of 24 journals.

The Qualis system, created by the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior* (CAPES) [Coordination for Improvement of Higher Education Personnel], is used to classify the quality of scientific production in graduate programs. This process is based on information provided by higher education institutions, making available a list showing the classification of the journals used by graduate programs to disseminate their production.<sup>7</sup>

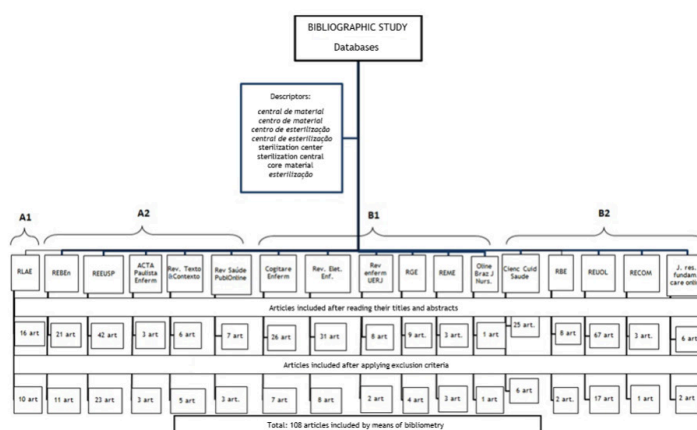
The stratification of the production quality is carried out indirectly. The Qualis system evaluates the quality of articles and other means of production by analyzing journals.<sup>7</sup> In the present study, journals classified as A1, A2, B1, and B2 according to the Qualis system were chosen to be searched since their value is recognized worldwide.

This research was carried out independently by two researchers from August 9 to September 26, 2017. Article search was carried out by using the following databases: Scientific Library Online (SciELO), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and *Base de Dados de Enfermagem* (BDENF) [Nursing Database]. The following descriptors were used: *central de material*, *centro de material*, *centro de esterilização*, *central de esterilização*, *sterilization center*, *sterilization central*, *core material* and *esterilização*. As this study sought to characterize the historical evolution of studies on the subject, no time restriction was applied during the search. Thus, all articles on the subject published in the aforementioned journals were analyzed. In order to identify concepts, their titles were analyzed first, followed by abstracts and other sections.

Inclusion criteria were articles addressing MSC within the context of basic health care or hospital care. Exclusion criteria were articles not addressing the study subject or duplicates. A total of 286 articles were initially found. Nonetheless, 171 were duplicates, and 7 were excluded because they did not address sterilization performed in material centers, such as “vaccine sterilization” and “dental material sterilization in medical offices”. After applying this filter, 108 publications formed the final sample.

During the analysis of the journals, it was identified that the journals *Escola Anna Nery Revista de Enfermagem*, *Cadernos de Saúde Pública*, *Interface - Comunicação, Saúde, Educação*, *Revista da Rede de Enfermagem do Nordeste*, *Revista Enfermagem Brasil*, *Revista Enfermagem em Foco*, and *Revista de Enfermagem da UFSM* presented no results. In other words, of the 24 journals selected, 17 published articles on the study subject, as described by the flowchart shown in **Figure 1**.

**Figure 1.** Search results after analyzing publications on MSC published in journals rated from A1 to B2 according to the Qualis system.



The collected data were organized, coded, tabulated and submitted to descriptive statistical analysis using *Microsoft Excel*® 2007. For analysis purposes, the following bibliometric variables were chosen as follows: year of publication, journal, authors, methodological approach, object of study and target audience. Since this is a bibliometric study, the approval from the Committee on Ethics in Research with Human Beings was not required. Nonetheless, it is important to note that the ethical principles concerning research were all respected.

## RESULTS AND DISCUSSION

Among the 108 scientific articles selected, the oldest one was carried out in 1973 and addressed the basic principles of sterilization. Although in 1974, 1976, 1977, 1978, 1981, 1983, 1984, 1986, 1990, 1993, 1995, 1998, and 2000 no scientific production was found, a gradual increase in the number of publications was observed in recent years (**Table 1**).

**Table 1.** Distribution of the scientific production by year (1973-2017).

Year of publication	N	%
1973 - 1977	2	1.85
1978 - 1982	3	2.78
1983 - 1987	2	1.85
1988 - 1992	7	6.48
1993 - 1997	3	2.78
1998 - 2002	7	6.48
2003 - 2007	16	14.81
2008 - 2012	33	30.56
2013 - 2017	35	32.41
<b>Total</b>	<b>108</b>	<b>100.00</b>

Concerning scientific publication, there is a predominance of articles published in the *Revista da Escola de Enfermagem da USP* (21.30%), followed by the *Revista da Enfermagem UFPE* (15.74%) and *Revista Brasileira de Enfermagem* (10.18%). It was verified that 20 articles (18.52%) had Kazuko Uchikawa Graziano as one of authors, being the nurse with the greatest scientific production on the subject. The second author with the greatest number of publications was Ana Clara Ferreira Veiga Tipple (12.04%), followed by Adenícia Custódia Silva e Souza (5.55%).

Most of the articles featuring Kazuko Uchikawa Graziano as one of the authors were published in *Revista da Escola de Enfermagem da USP* (9.52%) and *Revista Latino Americana de Enfermagem* (6.67%).

Regarding the object of study, high heterogeneity was found (Table 2). Evaluation of the sterilization quality was the object of study that presented most interest (24.08%), followed by occupational health (14.88%). Nevertheless, hand hygiene, visibility of the MSC, MSC workers' feelings, and reuse of single-use materials were the objects of study with the lowest incidence in each area (0.92%).

**Table 2.** Distribution of the scientific production by the object of study (1973-2017).

Object of study	N	%
Evaluation of sterilization quality	26	24.08
Occupational health	16	14.82
Management of physical resources and materials	12	11.11
Sterilization technologies	10	9.26
Nursing's role at the MSC	9	8.33
Evaluation of indicators	7	6.48
Continued education	5	4.62
Mapping of sterilization processes	4	3.70
Nursing team's profile	4	3.70
Nursing design	3	2.78
MSC description	2	1.85

Experiences of nurses/nursing team members	2	1.85
Nursing diagnosis	2	1.85
MSC productivity	2	1.85
Hand sanitization	1	0.93
MSC visibility	1	0.93
Workers' feelings	1	0.93
Reuse of single-use materials	1	0.93
<b>Total</b>	<b>108</b>	<b>100.00</b>

As for the methodological approach, it was identified that the quantitative approach (58.33%) was more frequent than the qualitative one (25.01%). It is worth noting that 14.81% of the studies did not mention the methodology used or it was not possible to identify it (Table 3).

**Table 3.** Distribution of the scientific production by methodological approach (1973-2017).

Methodological approach	N	%
<b>Studies with a quantitative approach</b>	<b>63</b>	<b>58.33</b>
Descriptive study	27	25.00
Experimental study	10	9.26
Review of the literature	6	5.55
Methodological study	5	4.63
Observational study	4	3.70
Integrative review of the literature	4	3.70
Case study	3	2.78
Cross-sectional study	2	1.85
Systematic review of the literature	1	0.93
Concept analysis	1	0.93
<b>Studies with a qualitative approach</b>	<b>27</b>	<b>25.01</b>
Descriptive study	14	12.97
Experience report	6	5.55
Theoretical reflection	2	1.85
Ecological study	2	1.85
Multiple case study	1	0.93
Phenomenological study	1	0.93
Strategic study	1	0.93
<b>Studies with a quali-quantitative approach</b>	<b>2</b>	<b>1.85</b>
Descriptive study	2	1.85
<b>Not clear or not possible to be identified</b>	<b>16</b>	<b>14.81%</b>
<b>Total</b>	<b>108</b>	<b>100.00</b>

Observing the target population (Table 4), the MSC nursing team predominated (51.85%), followed by health care products (24.07%), sterilizing agents (4.63%), and technologies (4.63%). It is worth noting that the target population could not be identified in two studies (1.85%).

**Table 4.** Distribution of the scientific production by the target population (1973-2017).

target population	N	%
MSC nursing team	56	51.85
Health care products	26	24.08
Sterilizing agents	5	4.63
Technologies	5	4.63
Packages	4	3.70
Infrastructure	4	3.70
Nursing students	2	1.85
Health care institutions	2	1.85
Unknown	2	1.85
Surgical Boxes	1	0.93
Costs	1	0.93
<b>Total</b>	<b>108</b>	<b>100.00</b>

The development of nursing research on MSC published in Brazilian journals has grown since the last two decades. Although 108 published articles have been identified since 1973, it is still a small number compared to the articles on other themes. This fact corroborates the need for greater advances in research on MSC, especially for better substantiating the nursing work process and establishing an evidence-based practice, aiming at the development of technological advances in the area.<sup>8</sup>

Considering the 24 journals analyzed, 17 published articles on MSC, which met the inclusion criteria. In this sense, the three journals that were predominantly published were REEUSP, REUOL and *Revista Brasileira de Enfermagem*. It is believed that REEUSP has the largest production in the area because of the work of a full professor and nurse at the School of Nursing located in São Paulo city, São Paulo State, Brazil. She is considered one of the most prominent researchers in Brazil regarding the subject with 18.52% of the articles published. This highlights her importance for research on MSC.

Kazuko Uchikawa Graziano was an author of 17 articles published in REEUSP and RLAE. Considering that they are characterized as national journals and are from São Paulo city, they have the mission of promoting the production and dissemination of nursing knowledge worldwide for the advancement of nursing science.

Ana Clara Ferreira Veiga Tipple, who was nurse, PhD, and Professor at *Universidade Federal de Goiás* (UFG), was the second most present author and has carried out studies on the prevention and control of healthcare-related infections in MSCs.

One of the bibliometric indicators associated with science evaluation is the SCImago Journal & Country Rank (SJR), a method for evaluating scientific journals using the number of citations per time interval. The REEUSP (A2) has a value of 0.257 and the RLAE (A1) has a value of 0.394.<sup>9-10</sup>

As for the object of study, it was evident that they were quite different. It is highlighted that the evaluation of sterilization quality was the most studied theme (24.07%). Evaluation of sterilization quality is an extremely relevant object of study for clinical practice since it contributes to the knowledge of HCP processing, especially in regard to the technique and method of processing.<sup>11</sup>

However, it should be noted that most studies addressed the issue of good practices for the proper functioning of health care services responsible for processing hospital products. They focused on the concern for the quality and safety of patients and workers.<sup>1,12-13</sup> In this sense, occupational health was the second most studied theme (14.81%) according to the study results. The reason is that this type of activity exposes the nursing team to risks.<sup>14</sup>

Although the results showed increased production in the area of quality evaluation, there was a low number of studies on technological advances in MSCs, especially

considering the use of new technologies in MSCs within the current context of health care services. Also, it should be noted that research on technology tends to have high costs and requires the participation of researchers from other areas of science.<sup>5</sup>

Concerning the object of study, the results showed that there are gaps in knowledge production, which can certainly be addressed in future investigations. They can certainly provide guidance on choosing the object of study for undergraduate or graduate research.

It is believed that these results may be justified by the ease of teaching MSC in nursing undergraduate courses, the difficulty of institutions in accessing MSC units for teaching practices, and the level of interest in the activity performed in MSCs. This is because there are unfeasibility and devaluation of the work performed in these units despite its great importance for health care services. Thus, it is highlighted that nursing undergraduate courses play a key role in the development of nursing knowledge.<sup>15</sup>

With respect to the methodological approach, studies with a quantitative approach obtained greater representation; however, most of them were descriptive studies not allowing inference about other realities. When there is a need to understand non-quantifiable aspects that allow the understanding of the subject's experience, it is necessary to use a qualitative approach, which was identified in 25% of the articles.<sup>16-17</sup> Twice as many studies with a quantitative approach were found compared to those with a qualitative approach, emphasizing the importance of carrying out studies employing both methodologies. On the one hand, there is the need to quantify phenomena through inferential statistics; on the other hand, there is the need to understand non-quantifiable issues.<sup>17</sup>

The most predominant target population was the nursing team (51.85%), followed by health care articles or surgical instruments (24.08%). These findings may be justified by Resolution No. 424 of the Federal Nursing Council, which regulates the duties of nursing professionals working in MSCs and institutions dealing with the processing of HCPs. Also, Resolution No. 15 of the Collegiate Board, which regulates the requirements of good practices for processing HCPs, may explain this finding.<sup>1,3</sup>

## CONCLUSIONS

In recent years, the growing interest in MSCs by nurses is a reality and seems to be in line with the CAPES' investment in graduate programs and the creation of national resolutions involving MSCs.

This study showed that most Brazilian articles on MSC were published between 2013 and 2017. The three journals with the largest number of publications were REEUSP, REUOL and *Revista Brasileira de Enfermagem*. Despite the heterogeneity across the publications, the object of interest most present was the evaluation of sterilization

quality. Regarding the methodological approach, studies with a quantitative approach were most predominant. Also, the nursing team was the most frequent target population found in the analyzed articles.

The contributions of this study may be significant for guiding and choosing future research. It is also suggested that this research may be used as a basis for further research in order to fill the gaps in the knowledge about this subject.

It is considered, however, that there is still a need for greater investment in quantity and quality, aiming at the continuous improvement of good practices for processing HCPs, which contributes to maximizing the safety of patients and workers.

Conclusively, limiting the search to include only articles available in digital format may be considered one limitation of this study since printed articles on MSC may exist. Another limitation involves the choice of descriptors, which may have resulted in the exclusion of other studies on MSC.

## REFERENCES

1. Ministério da Saúde (Br). Resolução n. 15, de 13 de março 2012. Regulamenta os requisitos de boas práticas para o processamento de produtos para a saúde e dá outras providências. 2012 [Citado em 2018 mar 14]. Disponível em: [http://www.sobecc.org.br/arquivos/legislacao/06%20RESOLUÇÃO\\_RDC\\_%20Nº15\\_ANVISA\\_%20MARÇO%202012.pdf](http://www.sobecc.org.br/arquivos/legislacao/06%20RESOLUÇÃO_RDC_%20Nº15_ANVISA_%20MARÇO%202012.pdf)
2. Ministério da Saúde (Br). Resolução n. 50, de 21 de fevereiro 2002. Regulamento técnico para planejamento, programação, elaboração e avaliação de projetos físicos e estabelecimentos assistenciais de saúde. 2002 [citado em 2018 mar 10]. Disponível em: [http://portal.anvisa.gov.br/documents/33880/2568070/res0050\\_21\\_02\\_2002.pdf/ca7535b3-818b-4e9d-9074-37c830fd9284](http://portal.anvisa.gov.br/documents/33880/2568070/res0050_21_02_2002.pdf/ca7535b3-818b-4e9d-9074-37c830fd9284)
3. Conselho Federal de Enfermagem. Resolução n.424,de 19 de abril 2012. Regulamenta atribuições dos profissionais de enfermagem em centro de material e esterilização. 2012 [citado 2018 abr 02]. Disponível em: [http://www.cofen.gov.br/resolucofen-n-4242012\\_8990.html](http://www.cofen.gov.br/resolucofen-n-4242012_8990.html)
4. Ouriques CM, Machado ME. Nursing in the Process of Sterilization of Materials. Text Context Nursing [Internet]. 2013 jul-set [cited 2018 mai 15];22(3):695-703. Available from: [http://www.scielo.br/pdf/tce/v22n3/en\\_v22n3a16.pdf](http://www.scielo.br/pdf/tce/v22n3/en_v22n3a16.pdf)
5. Spruce L. Back to Basics: Sterile Technique. AORN j [Internet]. 2017 may [cited 2018 mai 29];105(5):478-87. Available from: <https://doi.org/10.1016/j.aorn.2017.02.014>
6. Marcelo JF, Hayashi MCPI. Estudio bibliométrico em laproducción científica del campo de lasociología de la ciência. Inf Inf [Internet]. 2013 [acesso em 05 nov 2017];18(3):138-53. Disponível em: <http://dx.doi.org/10.5433/1981-8920.2013v18n3p138>
7. Ministério da Educação (Br). Rede Nacional de Ensino e Pesquisa, Plataforma Sucupira. Qualis [Internet]. 2016 [citado em 2017 nov 06]. Disponível em: <https://sucupira.capes.gov.br/sucupira/#>
8. Gil RF, Camelo SH, Laus AM. Nursing Tasks in the Material Storage Center of Hospital Institutions. Texto e contexto enferm [Internet]. 2013 [cited 2013 dec 22];22(4):927-34. Available from: <http://dx.doi.org/10.1590/S0104-07072013000400008>
9. Nassi-Calò L. Evaluation metrics in science: current status and prospects. Rev latino am enferm [Internet]. 2017 [cited 2018 mar 18]. Available from: [http://www.scielo.br/pdf/rlae/v25/pt\\_0104-1169-rlae-25-e2865.pdf](http://www.scielo.br/pdf/rlae/v25/pt_0104-1169-rlae-25-e2865.pdf)
10. Avena MJ, Barbosa DA. Bibliometric indicators of the nursing journals according to the index databases. Rev Esc Enferm USP [Internet]. 2017 [cited 2018 jan 09];51(4):1-9. Available from: <http://dx.doi.org/10.1590/s1980-220x2017014603262>
11. Seavey RE. Sterile Processing Accreditation Surveys: Risk Reduction and Process Improvement. AORN j [Internet]. 2015 [cited 2018 mai 28]; 102(4):358-68. Available from: <https://doi.org/10.1016/j.aorn.2015.07.005>
12. Luckwü ADGV, Silva EL, Araújo EC. Exposure factors of the health professional to substances chemicals used in the process of cleaning and disinfecting at the purge sector. Rev enferm UFPE on line [Internet]. 2010 [cited 2017 nov 22];4(1):255-63. Available from: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/5858>
13. Jacoby AM, Rech KCJ, Ascari RA. Disinfection and sterilization in outpatient occupational health services. Cogitare enferm [Internet]. 2016 [cited 2018 mai 22];21(1):1-10. Available from: <https://revistas.ufpr.br/cogitare/article/view/42892/27663>
14. Souza, RQ, Graziano KU, Ikeda TI, Gonçalves CRA, Cruz AS. Cytotoxicity of PVC tubes sterilized in ethylene oxide after gamma radiation exposure. Rev Esc Enferm USP [Internet]. 2013 [cited 2018 jan 20];47(2):494-9. Available from: [http://www.scielo.br/pdf/reeusp/v47n2/en\\_31.pdf](http://www.scielo.br/pdf/reeusp/v47n2/en_31.pdf)
15. Costa CCP, Souza NVDO, Pires AS. Profile of workers of a material and sterilization: an analysis of social and professional characteristics. Rev pesqui cuid fundam (Online) [Internet]. 2016 [cited 2017 nov 07];8(1):3633-45. Available from: [http://www.seer.unirio.br/index.php/cuidadofundamental/article/view/3667/pdf\\_1767](http://www.seer.unirio.br/index.php/cuidadofundamental/article/view/3667/pdf_1767)
16. Baggio MA, Rodrigues MA, Erdmann AL, Barbieri-Figueiredo MC, Vieira MM. Production of Nursing Thesis and Dissertations in Portugal, 2000-2010: A Bibliometric Study. Texto & contexto enferm [Internet]. 2014 [cited 2017 jan 04]; 23(2):250-60. Available from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-07072014000200250&lng=en&tlng=en](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-07072014000200250&lng=en&tlng=en)
17. Ferreira MA, Pereira AMNA, Martins JCA, Barbieri-Figueiredo MC. Palliative care and nursing in dissertations and theses in Portugal: a bibliometric study. Rev Esc Enferm USP [Internet]. 2016 [Cited 2018 jan 20]; 50(2):317-23. Available from: <http://dx.doi.org/10.1590/S0080-623420160000200019>

Received on: 02/08/2019  
Required Reviews: 07/10/2019  
Approved on: 03/02/2020  
Published on: 27/04/2021

**\*Corresponding Author:**

Cintia Silva Fassarella  
Boulevard 28 de Setembro, 157  
Vila Isabel, Rio de Janeiro, RJ, Brasil  
E-mail: cintiafassarella@gmail.com  
Telephone: +55 (21) 9 7960-1978  
CEP: 20.551-030

The authors claim to have no conflict of interest.