

Operations and Supply Chain Management in Brazil:

Where Do We Come from and Where are We Going?

Gestão de Operações e Cadeia de Suprimentos no Brasil:

De Onde Viemos e para Onde Vamos?

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Abstract: This paper aims to understand how the Operations and Supply Chain Management field of research progressed in the last decade in Brazil, highlighting major research topics and methods adopted. We analyzed articles of researchers affiliated with Brazilian universities in the leading national and international journals between 2010 and 2019. Moreover, we compared those results with the findings of Paiva and Brito (2013), carried out for the previous decade, and with the publications in the Journal of Operations Management [JOM], the worldwide leading journal in the field. Our results suggest growing diversity in research topics and methods adopted by Brazilian researchers in the last decade and a lower concentration in the most traditional ones, reflecting a greater maturity of the field in Brazil. Also, the results suggest differences when we compared with the JOM publications, which brought new methods, such as secondary data, experiments, and multimethod, and topics, such as risk management and humanitarian supply chains. Our research indicates possible trends in research topics

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and methods identified at national and international events, especially on new technologies and new research contexts.

Keywords – Operations Supply Chain Management; Scientific Production; Trends.

Resumo: Nos últimos anos, os pesquisadores brasileiros da área de Gestão de Operações e Cadeias de Suprimentos tem realizado um grande esforço para participar de forma mais qualificada do debate científico internacional. O objetivo desse artigo é entender como esta área evoluiu na última década, entre 2010 e 2019, e quais as principais tendências em temas e métodos de pesquisas no período. Foram analisadas as publicações de pesquisadores vinculados às universidades brasileiras nos principais periódicos nacionais e internacionais e, posteriormente, comparou-se os resultados, com os achados de Paiva e Brito (2013), e com dados do período do Journal of Operations Management [JOM], um dos principais periódicos da área. Os resultados sugerem que houve uma maior diversidade em temas e métodos adotados nas publicações de pesquisadores brasileiros na última década, o que pode ser reflexo de uma maior maturidade da área no Brasil. Ao se comparar com as publicações do JOM, foi possível identificar que há diferenças em relação aos métodos utilizados por pesquisadores estrangeiros, manifestadas pela escassez de pesquisas baseadas em dados secundários, em experimentos, bem como na abordagem multimétodo. Quanto aos temas, as lacunas são identificáveis em estudos sobre gestão de riscos e cadeias humanitárias.

Palavras-chave – Gestão de Operações e Cadeia de Suprimentos; Produção Científica; Evolução; Tendências.

Acknowledgements

The authors are grateful to Ely Paiva and Luiz Brito for their useful comments and suggestions. This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001.

Introduction

The Operations and Supply Chain Management [OSCM] field has been demanded to present solutions to several challenges in the last decades (Seyedghorban, Samson & Swink, 2021) including natural disasters (Gou & Lam, 2019; Ye, Jiao & Yan, 2020), political instability (Roscoe, Skipworth, Aktas & Habib, 2020), and more recently the new coronavirus [COVID-19] pandemic (Ivanov & Dolgui, 2020). While showing the importance of the field for companies and society, those threats exposed the

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fragility of the current knowledge to respond to new challenges (Choi, Rogers & Vakil, 2020). Since its emergence in the late 1960s, the OSCM field has been recognized by practitioners and scholars (Shang, Saladin, Fry & Donohue, 2015). This importance can be highlighted by the growing number of papers and academic journals focused on this topic (Walker, Chicksand, Radnor & Watson, 2015), and the operational and strategic complexity that it has achieved in companies in recent decades (Choi, Cheng & Zhao, 2016; Choi, Rogers & Vakil, 2020). In Brazil, this process has not been different, awakening academia and companies to the practical and theoretical importance of the OSCM field.

The OSCM literature was previously analyzed by Paiva and Brito (2013) in Brazil. However, beyond new demands included in the OSCM scope, the national academic environment itself has changed, impacting scientific production (MacCarthy, Lewis, Voss & Narasimhan, 2013; Andrade, Oliveira, Maccari & Hollnagel, 2018; Patrus, Shigaki & Dantas, 2018). We can highlight the pursuit of some national institutions to obtain international certifications, incorporating new parameters for evaluating the production of professors and students (Lozano, Bofarull, Waddock & Prat-i-Pubill, 2018; Barrett, Fernandez & Gonzalez, 2019). Moreover, the national evaluation of the scientific production of professors in graduate programs by the Coordination for the Improvement of Higher Education Personnel [CAPES] (CAPES, 2017) added parameters for measuring the quality of publication from the 2013-2016 quadrennium, ranking journals in the Qualis CAPES list. Simultaneously, Brazilian researchers have directed their research to broadly understand the business environment, frequently including social and environmental issues in OSCM studies (Jabbour, 2014; Del Río-Rama, Álvarez-García & Coca-Pérez, 2017; Boaventura, Abdalla, Araújo & Arakelian, 2018).

Technological, economic, political, and social changes require continuous adaptation to an environment characterized by considerable uncertainties to global supply chains (MacCarthy et al., 2013; Flynn, Koufteros & Lu, 2017). Therefore, Brazilian research should reflect those changes in their studies, incorporating those elements in their production. However, it is still uncharted if and how we incorporate these demands in our publications. It is necessary to understand how those changes, inside and outside the academy, have affected the production of Brazilian researchers in the last decade, especially those published in leading journals.

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The following question guided this study: *How has the OSCM field of research progressed in the last decade in Brazil?* This research aims to understand how the OSCM field of research progressed in the last decade in Brazil, highlighting major research topics and methods adopted in OSCM articles published in national and international leading journals by researchers associated with Brazilian universities. Moreover, we compare our results to the Paiva and Brito's (2013) paper, tracing the evolution of two decades of research in the field. Last, this study seeks to point to future research that emerged from topics and methods adopted by national and international conferences and the Journal of Operations Management [JOM] publications, the worldwide leading journal. To address this question, we follow a systematic literature review approach (Durach, Kembro & Wieland, 2017).

We contribute to the OSCM literature by addressing the following gaps. First, our results showed growing diversity in research topics and methods adopted by Brazilian researchers in the last decade and, simultaneously, a lower concentration in the most traditional ones, reflecting a greater maturity of the field in Brazil. Second, we highlighted research avenues by comparing our results with JOM's publications and conferences, indicating possible trends on research topics, such as new technologies, contexts, risk management, and humanitarian supply chains; and methods, such as secondary data, experiments, and multimethod, and topics, such as risk management and humanitarian supply chains. Third, we consider that the Brazilian context should be emphasized in our research, bridging international discussion to the insights from our issues and demands.

The following section presents the methodological procedures for selecting journals, articles, and conferences for analysis. The third section presents the OSCM scenario in the last decade based on the analysis of the most frequent topics and methods adopted by researchers from Brazilian universities. In the fourth section, we compare these results to the previous study of Paiva and Brito (2013). The fifth section presents the emerging topics identified in congresses, following the conclusions of this paper.

Research Methods

We employ a systematic literature review to address our research question. This research method is largely applied to advance knowledge in the OSCM literature because it can “make inferences on the

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basis of the appraisal and synthesis of multiple studies” (Durach, Kembro & Wieland, 2017, p. 67). We followed the six steps model proposed by Durach, Kembro and Wieland (2017) for systematic literature review, presented in the following subsections. In the first step, we defined the research question in the introduction section based on the need to compare how the OSCM field in Brazil has evolved in the last decade. The second step, *determine the required characteristics of primary studies*, presents the criteria to determine if the article provides essential information and should be included in the sample. We addressed this step by selecting journals by guiding lists. The third step, *retrieve a sample of potentially relevant literature*, defines the structure of the search. This research addresses it by defining twelve themes for searching the database. The fourth step, *select the pertinent literature*, we addressed it by selecting articles focused on OSCM issues published in national and international journals for Brazilian researchers. Step five, *synthesis of the literature*, and six, *report the results*, are present in the next section, Findings. In that section, we highlighted major research topics and methods adopted in OSCM articles, comparing them with a prior study (Paiva & Brito, 2013), conferences’ topics, and JOM’s topics and methods.

Sampling Journals

Although we applied different criteria to select national and international journals for this study (Table 1), they were based on guiding lists proposed by academic institutions. To select the national journals, we follow the CAPES Qualis list, specifically those ranked in the A2 stratum in the Public and Business Administration, Accounting Sciences, and Tourism area published in Brazil, resulting in 11 national journals.

Table 1.
Journal Selection Criteria

Sample	Criteria	Selected Journals
National journals	i) Journals classified in CAPES Qualis list (2013-2016). ii) Journals classified in the A2 strata, the highest for national periodicals. iii) Journals focussed on Business linked to postgraduate programs or business associations, for example, the National	Brazilian Administration Review [BAR] Brazilian Business Review [BBR] Cadernos EBAPE Revista Brasileira de Finanças [RBFIn] Revista Brasileira de Gestão de Negócios [RBGN] Revista de Administração Contemporânea [RAC] Revista de Administração da USP [RAUSP] Revista de Administração de Empresas [RAE]

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	Association of Postgraduate Studies and Research in Administration [ANPAD].	Revista de Administração Pública [RAP] Revista de Contabilidade e Finanças Organizações e Sociedade [O&S]
International journals	i) Journals classified in the Academic Journal Guide carried out by the British Association of Business School in the Operations and Technology Management category. ii) Journals ranked in the three highest extracts (3, 4, and 4*) of the Academic Journal Guide (2018).	Computers in Industry IEEE Transactions on Engineering Management International Journal of Operations and Production Management International Journal of Production Economics International Journal of Production Research Journal of Operations Management Journal of Scheduling Journal of Supply Chain Management Manufacturing and Service Operations Management Production and Operations Management Production Planning and Control Supply Chain Management: An International Journal

Source: Authors

To select international journals, we followed the Academic Journal Guide [AJG], organized by the Chartered Association of Business Schools (2018), which is employed to classify journals in Management fields. The list is built by a review board of editors and methodologists, then by a review by the scientific committee of experts on the subject along with, where applicable, supporting metrics, such as Source Normalized Impact per Paper and Journal Citation Reports [JCR]. The guide is composed of 22 categories that fill the major research fields, increasingly classifying articles by strata: 1, 2, 3, 4, and 4*, the last being the highest quality strata. We selected the journals of the top three strata (3, 4, and 4*) in the Operations and Technology Management category, totalling 12 international journals. A total of 89% of United Kingdom business academics use the AJG list (Walker, Fenton, Salter & Salandra, 2019a). Also, AJG has an international influence, with the United States being the second-largest country that applied it (Walker, Salter, Fontinha & Salandra, 2019b).

The AJG List is not based purely on a weighted average of metrics from journals. The guide reflects: (i) the editors' perceptions, (ii) informed by the Scientific Committee and, (iii) expert and academic opinions in each thematic area. The evaluations of the journals listed there are not captured mechanically (Wu, Li, Zhu, Song & Li, 2015). Walker et al. (2019a, p. 743) argue that journal lists are one of the tools for a shift in research assessment to promote more formal and measurement-based methods, driven by governments that want to “make research systems more 'accountable' in various ways

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for the public that finance them”. Just as there are advantages, there are also several criticisms of the use of lists of journals. The impact of these artifacts on business schools, academics, and discipline cannot be denied (Vidgen, Mortenson & Powell, 2019). Finally, the adoption of journal lists such as the AJG List by business schools has a socializing effect on behavior (Agyemang & Broadbent, 2015).

Sampling Articles

After the selection of journals, we defined twelve themes for searching the database, broadly enough to select to identify all the articles published in the selected journals between the years 2010 and 2019 (Table 2). For national journals, we seek on the website of each journal, applying codes in English and Portuguese. That resulted in 85 articles from 9 national journals.

Table 2.

Constructs and codes

Constructs	Codes
Supply chain	(“cadeia de suprimentos” OR “supply chain”)
Operations strategy	(“estratégia de operações” OR “operations strategy”)
New product development	(“desenvolvimento de novos produtos” OR “product development”)
Service operations	(“operações de serviços” OR “service operations”)
Quality management	(“gestão da qualidade” OR “quality management”)
Sustainable operations	(“operações sustentáveis” OR “sustainable operations”)
Operations teaching	(“ensino de operações” OR “operations teaching”)
Production planning	(“programação da produção” OR “production planning”)
Operations performance	(“desempenho em operações” OR “operations performance”)
Operations management	(“gestão de operações” OR “operations management”)
Production management	(“gestão da produção” AND “administração da produção” OR “production management”)

Source: Authors

On the other hand, we employed the Web of Science database to select articles from international journals. In that database, we selected publications of authors that were affiliated with Brazilian higher education institutions. For example, an article that analyzed German companies written by an Indian researcher linked to a Brazilian university would be classified as a Brazilian production by the database. Thus, we employed codes in English since there are no publications in Portuguese on the AJG list, resulting in 125 articles published in 9 international journals between the years 2010 and 2019 were selected (The list of articles is available on request). We employ descriptive analysis to investigate our dataset. Except for the

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absolute number of articles published in national and international journals (Figure 1), we used relative frequency to compare different samples of articles.

Themes selection from conferences

Simultaneously, we identified academic conferences that could present trends for OSCM research. Although journal publications portray more mature academic research, their publication process requires time, taking years between the execution of the research and its publication. On the other hand, academic congresses offer an important overview of the working research in the field. Also, congresses are used by researchers as part of the process of research maturity; researchers tend to present their research in conferences before definitive publication in journals, anticipating trends in the field. Therefore, we selected four international conferences and one national conference considering the importance for the area, using its tradition and attendees as criteria (Table 3).

Table 3.
Selected conferences

Conferences	Attendees*	Start date
Annual Meeting of the Academy of Management [AoM] 2019	10.000	1940
ANPAD [EnANPAD] Meeting 2020	2.000	1976
European Operations Management Association [EurOMA] 2019	600	1993
Decision Science Institute Annual Conference [DSI] 2020	1.400	1960
Production and Operation Management Society Conference [POMS] 2020	2.000	1989

Note. *An approximate number of participants, considering information on the official websites or contact with the organizing team.

Source: Authors

After selecting the conferences, we sought to identify the themes used to select and group the presentations in the last edition reported on the official websites in June 2020. Then, we selected those themes into three categories: traditional themes, including mature issues, and historically discussed by the field; consolidated themes, including research with recent themes, but with literature already consolidated in journals; and emerging themes, which may indicate possible research trends for the area (Appendix).

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Sampling Journal of Operations Management publications

We selected JOM publications for a comparative analysis of this study. JOM was first published in 1980 and established as the most important journal for OSCM literature worldwide. It is the only journal classified in the highest stratum of the ABS List (4*) in the Operations and Technology Management category. Currently, its editorial policy has been more inclusive, encouraging studies that applied diverse methods. Also, this policy encouraged greater diversity in authorship country origin. On average, 12.4 countries were represented in publications between 2005 and 2009, while this number grew to 15.2 countries in the following five years. (Babbar et al., 2020). Moreover, several studies have used the JOM as a source of obtaining articles for theoretical and methodological evolution analysis (Choi & Wacker, 2011; Dobrzykowski & Tarafdar, 2015; Walker, Chicksand, Radnor, & Watson, 2015).

The JOM is a reference journal (Koufteros, Babbar, Behara & Baghersad, 2021), considered one of the three main journals in the area (Walker et al., 2015). Therefore, there is an implicit recognition of researchers who manage to publish in the JOM, these are recognized worldwide - either by the wide dissemination that the JOM has or even by the recognition of excellence. This journal has been known to have a great influence in the area due to the quality and relevance of its publications. It is plausible that there are powerful effects on academics in business schools regarding the AJG List (Willmott, 2011).

Findings

Where are we? OSCM publications in Brazil (2010-2019)

In this section, we present a descriptive analysis of the articles published by researchers from Brazilian universities in the period from 2010 to 2019 (Figure 1). Our data indicate that, on average, eight articles were published per year in the A2 stratum journals, oscillating from three to 17 during this period. However, the numbers point to an increase in international publications in recent years. The greater number of publications in international journals suggests that Brazilian authors from the fields of Production Engineering and Management published in the same journals. On the other hand, there is a preference for journals of Qualis your specific field in Brazil since Qualis is not yet unified.

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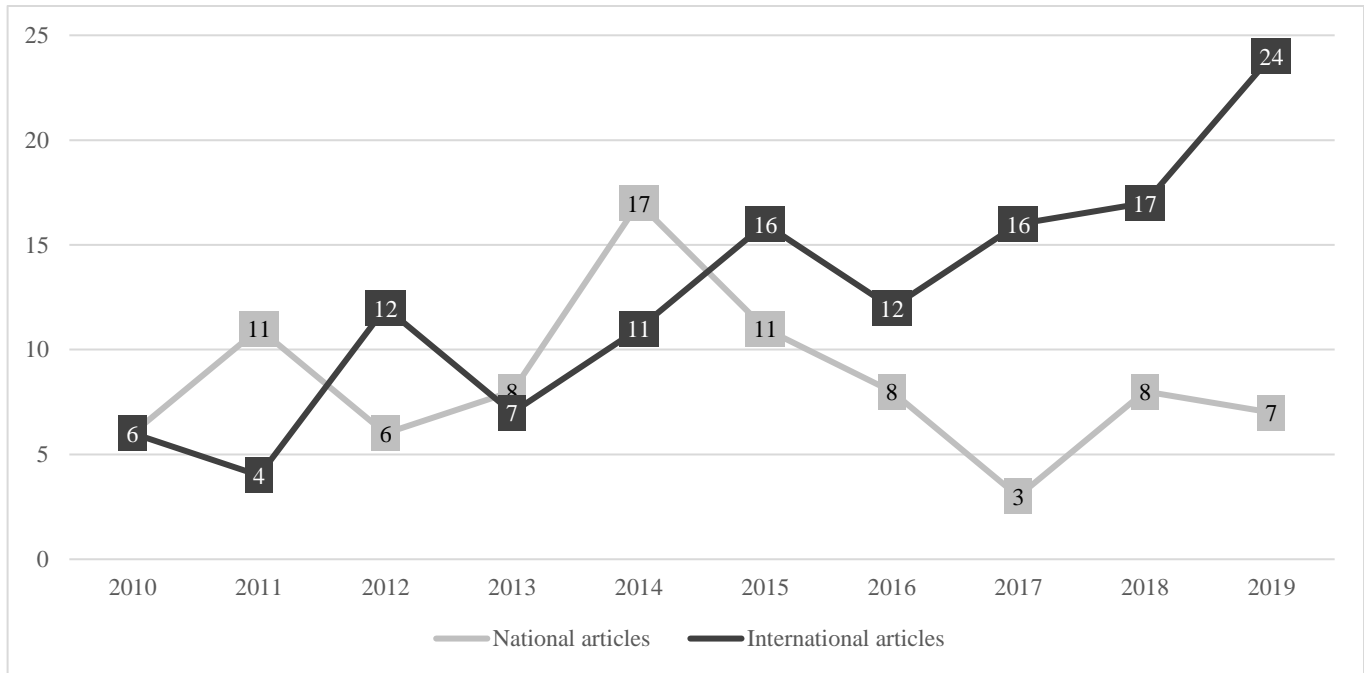


Figure 1. Comparison of national and international production of researchers from Brazilian universities (2010-2019).

Furthermore, the data suggest a tendency to publish in international journals. This finding is supported by the efforts of some programs for internalization, seeking international certifications, and changing incentives for their researchers. Also, the Qualis CAPES list, which ranks journals through parameters that measure the quality of publication, induces Brazilian researchers to seek international journals, since it ranks national journals at the stratum A2, while international journals could be classified as A1, the higher stratum in the list. Last, the Brazilian researchers seek greater adherence to the international debate and, simultaneously, legitimacy with national peers when they publish in international journals.

As the first analysis of journals, the classification of publications by Brazilian authors by journal was chosen (Table 4). The journal with the greatest presence of OSCM articles is the RAE, with 33 articles in the analyzed period. On the other hand, there is a predominance in a group of international journals,

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including the International Journal of Production Economics, with 38 articles, followed by the International Journal of Production Research with 35 articles.

Table 4.

Publications of researchers from Brazilian universities by journals (2010-2019)

Journals	Impact factor (JCR/2019)	AJG (2018)	Qualis CAPES (2013-2016)	Articles
Nationals				
Revista de Administração de Empresas [RAE]	0,472	N/A	A2	33
Revista de Administração Contemporânea [RAC]	N/A	N/A	A2	17
Revista Brasileira de Gestão de Negócios [RBGN]	0,875	N/A	A2	10
Brazilian Administration Review [BAR]	N/A	N/A	A2	7
Brazilian Business Review [BBR]	N/A	N/A	A2	6
Revista de Administração Pública [RAP]	N/A	N/A	A2	6
Revista de Administração da USP [RAUSP]	N/A	N/A	A2	3
Revista de Contabilidade e Finanças	N/A	N/A	A2	2
Cadernos EBAPE	N/A	N/A	A2	1
Revista Brasileira de Finanças [RBFIn]	N/A	N/A	A2	0
Organizações e Sociedade [O&S]	N/A	N/A	A2	0
TOTAL	-	-	-	85
Internationals				
International Journal of Production Economics	5,134	3	A1	38
International Journal of Production Research	4,577	3	A1	35
International Journal of Operations and Production Management	4,619	4	A1	16
Supply Chain Management: An International Journal	4,725	3	A1	14
Production Planning and Control	3,605	3	A1	14
Journal of Supply Chain Management	6,842	3	A1	2
Computers in Industry	3,954	3	A2	2
IEEE Transactions on Engineering Management	2,784	3	N/A	2
Production and Operations Management	2,590	4	N/A	2
Journal of Operations Management	4,673	4*	N/A	0
Journal of Scheduling	1,765	3	A1	0
Manufacturing and Service Operations Management	4,281	3	N/A	0
TOTAL	-	-	-	125

Source: Authors

The results also reveal a diversity of the preferred theme in the published articles (Figure 2). The theme most addressed in national and international articles is supply chain management. Second, the theme of sustainable operations with 19 articles is the most present in international articles. This can be described by some factors, such as the Brazilian context being considered relevant to the theme due to the natural resources and their historical connections with the global agri-food chains. At the same time, there

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is a growing interest in this topic for international journals, leading national researchers to increase their partnerships with researchers from other countries.

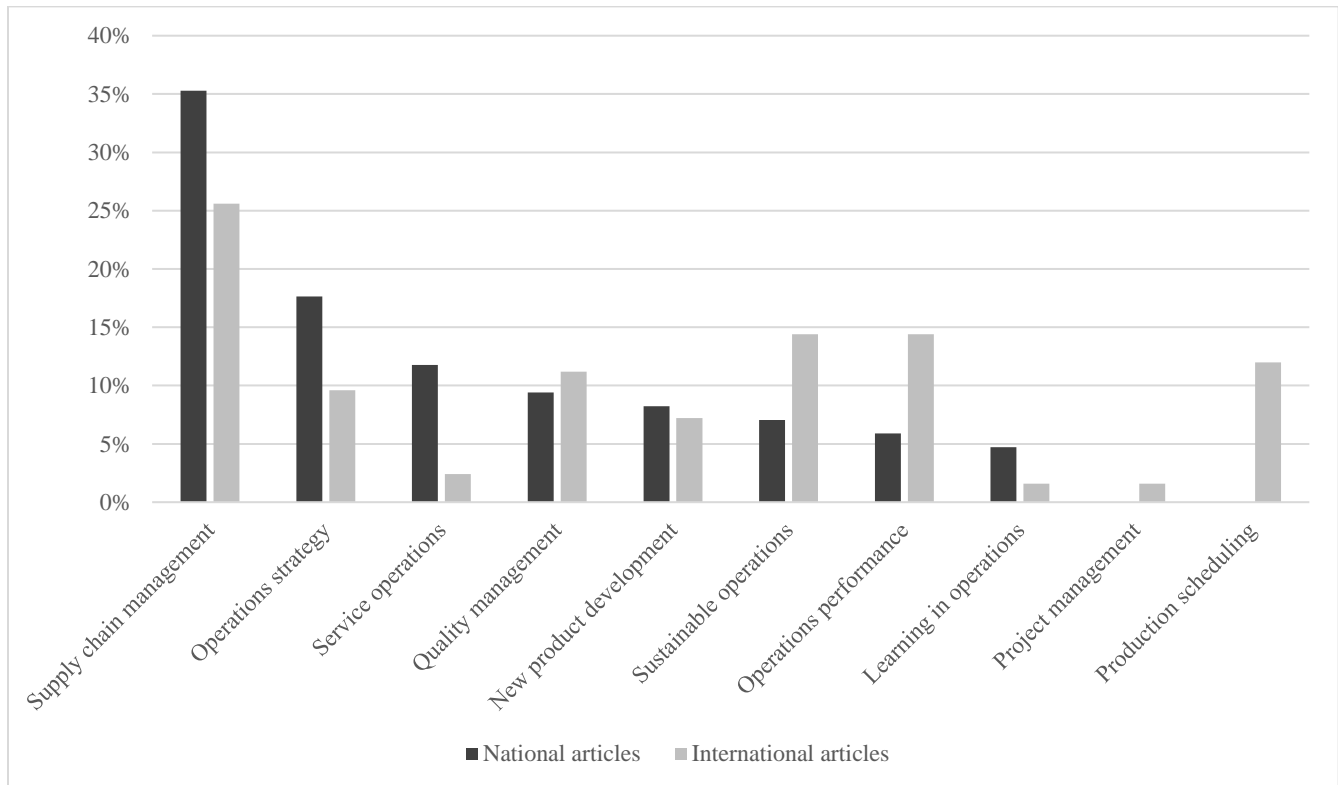


Figure 2. Comparison of preferred themes in articles published in national and international journals (2010-2019)

It is also possible to observe that national publications are more concentrated on the themes of supply chain management and strategy in operations, which together represent more than half of the published articles. Although both themes could embody many articles in the sample, we only categorized articles primarily focused on those themes, not fitting in any other category. In the international articles, there is a more balanced distribution of the themes, with the themes: sustainable operations, performance in operations, quality management, and production scheduling, each representing 10% to 25% of the articles published in the period.

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The type of method used in the studies during this period was also analyzed (Figure 3). The present methods were survey, case study, action research, qualitative, quantitative methods using secondary data, modeling, multimethod, analysis of social networks, and theoretical and bibliographic methods. Although there is no significant predominance of a single method, a survey is the most used in both national (31%) and international (27%) articles.

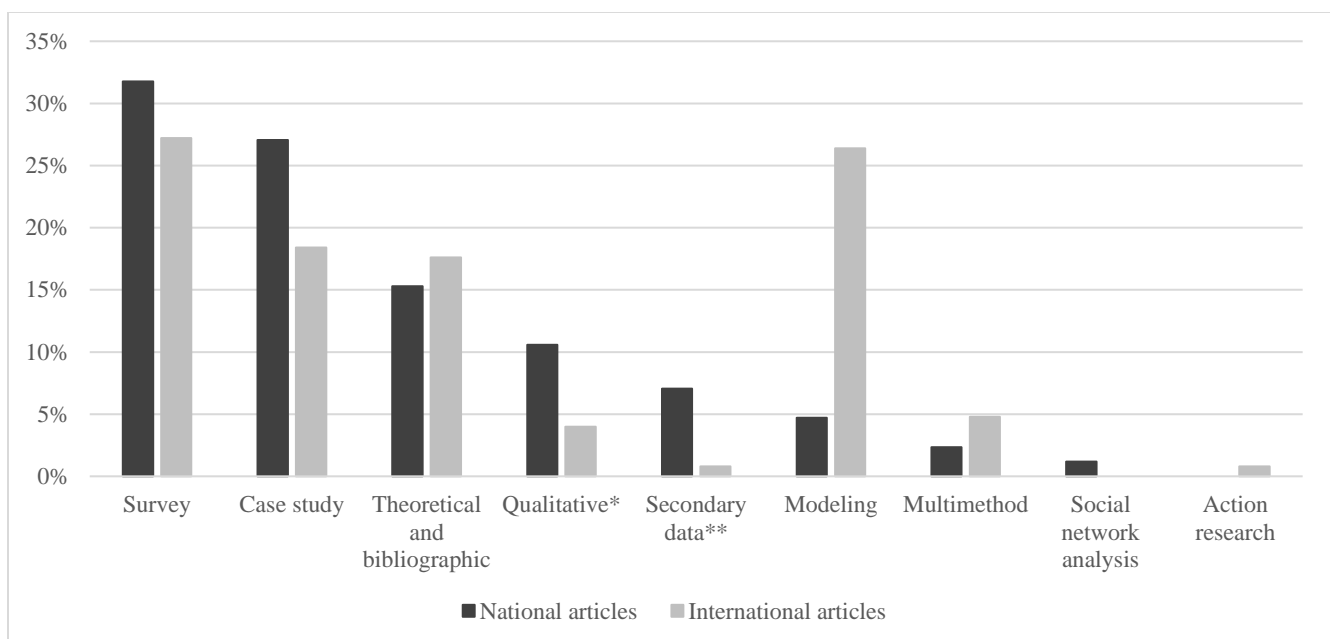


Figure 3. Comparison of methods used in articles published in national and international journals (2010 - 2019)

*Note. Other qualitative methods except for the case study and action research.

**Note. Quantitative methods using secondary data.

In national articles, the second most used method is the case study, with 27% of publications, while in international articles it is modeling, with 26%. As methods are still on the rise in operations management, the analysis of social networks was identified, with a national article, and action research, which presented an international article.

Where do We Come From? Revisiting Paiva and Brito's (2013) study

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After analyzing the data between the years 2010 and 2019, we did a comparative analysis with the study of Paiva and Brito (2013), which analyzed data from the period between 2000 and 2010. However, it is necessary to highlight some limitations. The study by Paiva and Brito (2013) analyzed a smaller base of journals chosen for their prestige and relevance to the field, including three national journals Qualis A2 (Brazilian Administration Review, Revista de Administração Contemporânea, e Revista de Administração de Empresas) and four international journals (International Journal of Production Economics, International Journal of Operations and Production Management, Journal of Operations Management and Production and Operations Management). Therefore, fewer articles were identified and analyzed by this study, 39 national and 53 international publications. We present our analysis based on the relative values of those publications, allowing the comparison between the two periods.

Figure 4 presents the compared data from the two periods concerning the topics published in national articles. In both periods, the topics of “supply chain management” and “operations strategy” emerge as the predominant ones. However, the topic of supply chain management, which represented 51% of publications in the 2000-2010 period, drops to 35% in the following period. Simultaneously, all other topics have increased their relative share, except the development of new products. We highlight the increase of “operations strategy”, “performance”, “learning in operations” and “sustainable operations”, emerging as even more representative topics in the period 2010-2019. Therefore, it is possible to infer that the OSCM field has sought to expand the scope of national publication topics, reducing the relative concentration on traditional themes.

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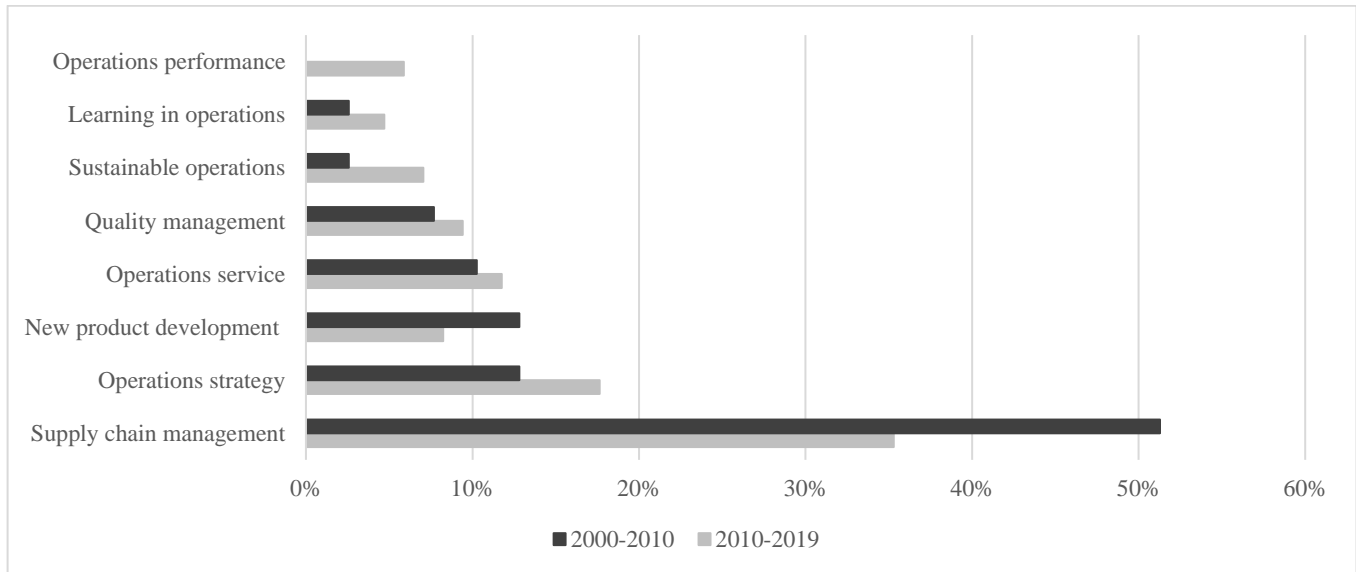


Figure 4. Comparison of themes published in national articles by researchers from Brazilian universities

From international publications analysis, we identified greater thematic coverage than national articles in the period 2000-2010, which remained in the following period (Figure 5). However, there have been significant changes in terms of the most representative topics. In the 2000-2010 period, the three most frequent topics were “production scheduling” (25%), “supply chain management” (17%), and “operations strategy” (17%). On the other hand, in the following period (2010-2019), only “supply chain management” remained the main topic, increasing its share to 26% of existing publications, followed by “performance” and “sustainable operations” both with 14%. Paiva and Brito (2013) identified those topics as future research opportunities in their study and confirmed by our results of 2010-2019.

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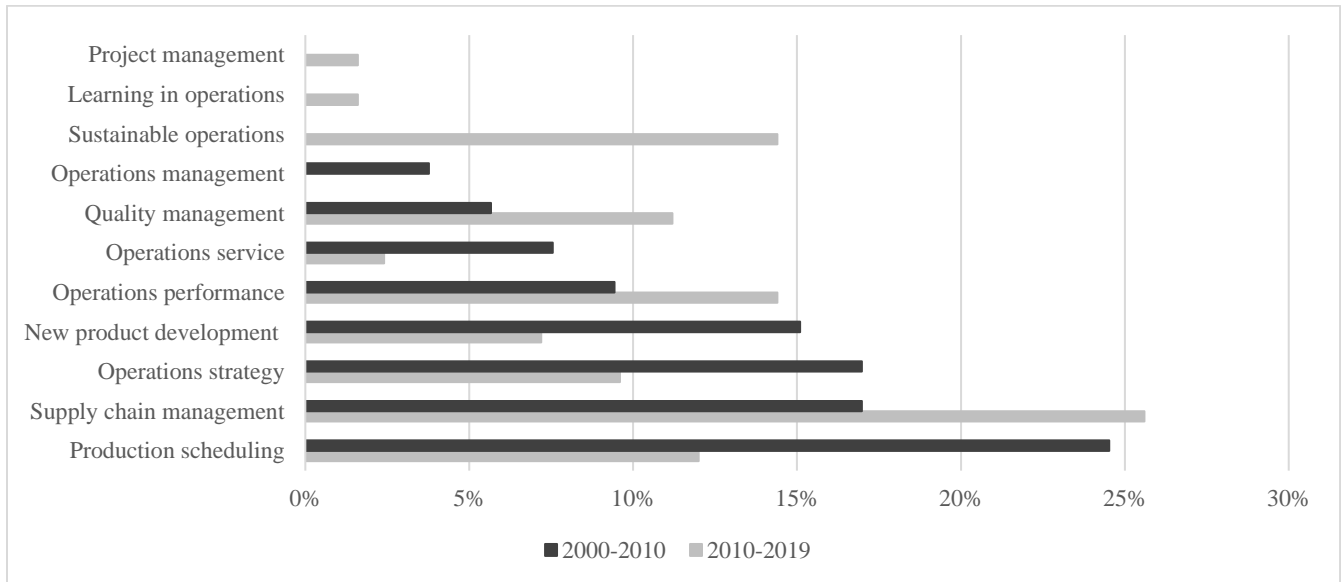


Figure 5. Comparison of topics published in international articles by researchers from Brazilian universities

From national publications analysis, we identified greater diversification in terms of the topics of the publications. The topics of “project management”, “earning in operations”, and “sustainable operations” emerged as primary topics in this period. In particular, the topic of “sustainable operations” has assumed a prominent role in international publications by Brazilian researchers. Not only because of the importance of the Brazilian context on this topic but with the creation of specific international conferences in OSCM, such as the EurOMA Sustainable Operations and Supply Chain Forum.

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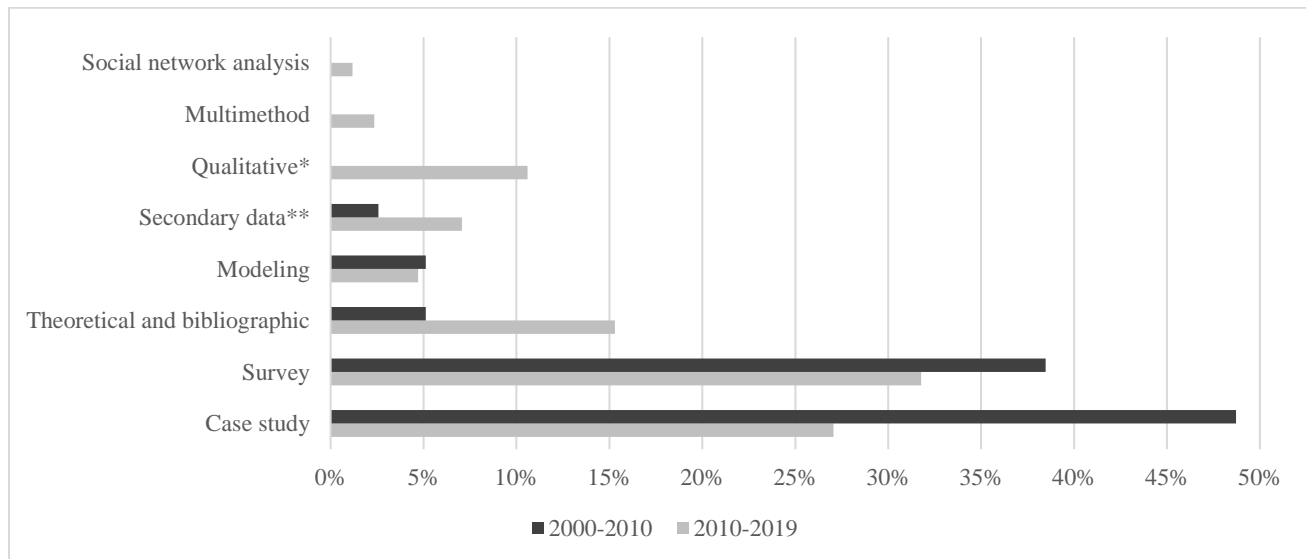


Figure 6. Comparison of methods used in national articles by researchers from Brazilian universities

*Nota. Other qualitative methods except for the case study and action research.

**Nota. Quantitative methods using secondary data.

Moreover, we identified the methods employed by the Brazilian researchers in articles published in national (Figure 6) and international (Figure 7) journals. In national articles, there was a change in the method most used between the two periods. In the first period, researchers employed the case study method in 49% of the articles, while the survey method was employed in 38% of the articles. In the second period, surveys appeared in 32% of publications, and case studies were employed in 27% of publications. Although there is a change in the relative position of both, the two methods remain the most present in international publications. The third most employed method was theoretical and bibliographic studies in the two periods. However, there has been an increase in this type of publication along with the growth of systematic literature reviews and bibliometrics.

We can infer that the OSCM field has diversified in the adoption of research methods in the period of 2010-2019. Social network analysis methods, multimethod, and other qualitative methods emerged as important methods during this period, such as research based on interviews, documentary analysis, and ethnography. Brazilian publications in national journals are also less concentrated on some methods. For example, case studies and surveys, remained as the main methods employed in 2010-2019, adding up 59% together, but less representative than in the previous period (87%).

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Regarding articles published in international journals, it is possible to identify two main movements. First, researchers employed additional methods, such as multimethod studies, secondary data, and other qualitative methods. Secondly, it is possible to observe the maintenance of previously used methods, such as modeling (39% to 26%), survey (29% to 27%), and case studies (25% to 18%), although in a less representative way. As in national publications, it was possible to observe that international publications expanded the methods used.

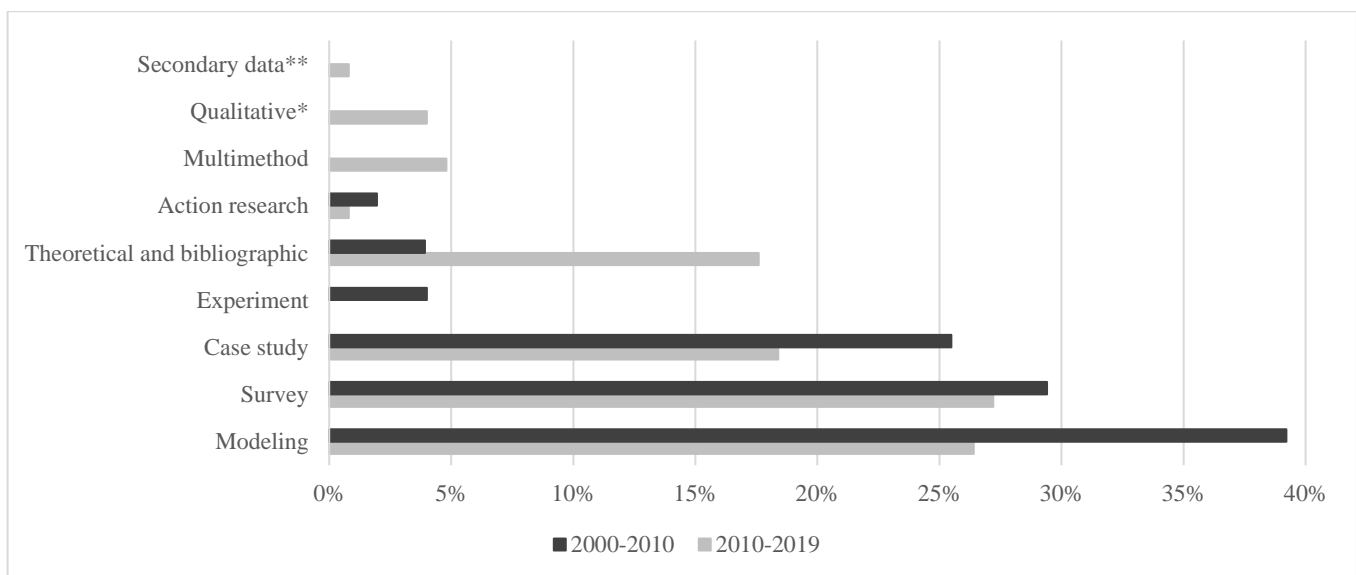


Figure 7. Comparison of methods used in international articles by researchers from Brazilian universities

*Note. Other qualitative methods except for the case study and action research.

**Note. Quantitative methods using secondary data.

What can we learn from Journal of Operations Management publications?

By comparing national and international publications by Brazilian researchers with publications made in the JOM, it was possible to identify topics and methods that are expanding in the field. Prestigious journals tend to influence others, who, when reproducing their practices, seek legitimacy (Meyer & Rowan 1977). Although Brazil has a unique context from where emerged specific issues addressed by OSCM researchers, Brazilian companies are increasingly integrated with global supply chains, also engaging with

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concerns from the US or Europe. Because of that integration, it is interesting comparing national scientific production with international publications.

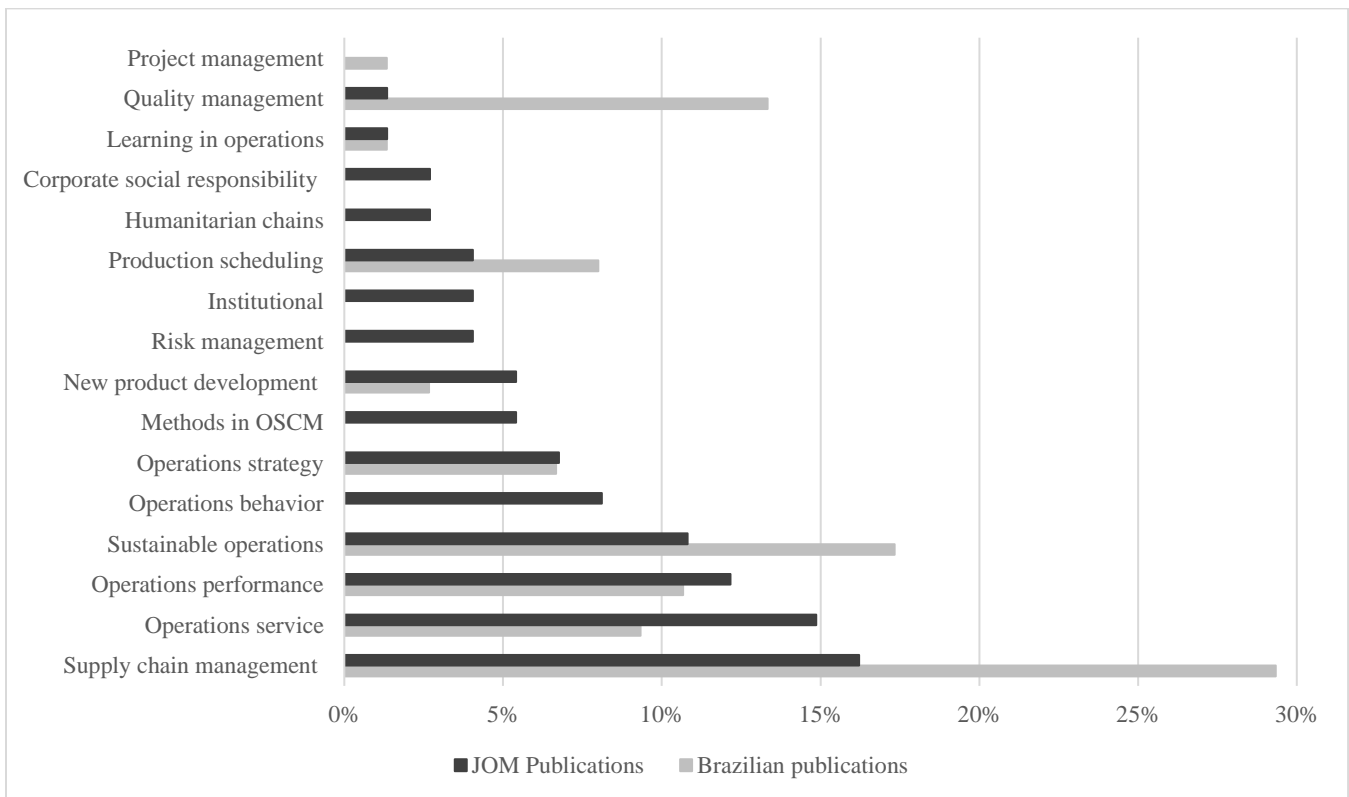


Figure 8. Comparison of preferred themes of articles published by researchers from Brazilian universities and in the JOM (2010-2019)

When comparing the published topics, it can be identified that consolidated topics in the field, such as “behavioral operations”, “methods”, “institutions”, “risk management”, “humanitarian supply chains”, and “corporate social responsibility” are listed among the most frequent in the JOM (Figure 8). On the other hand, Brazilian researchers choose different mostly topics, such as “supply chain management”, “sustainable operations”, “production scheduling”, and “quality management”, which may suggest different research aims and society’s demands.

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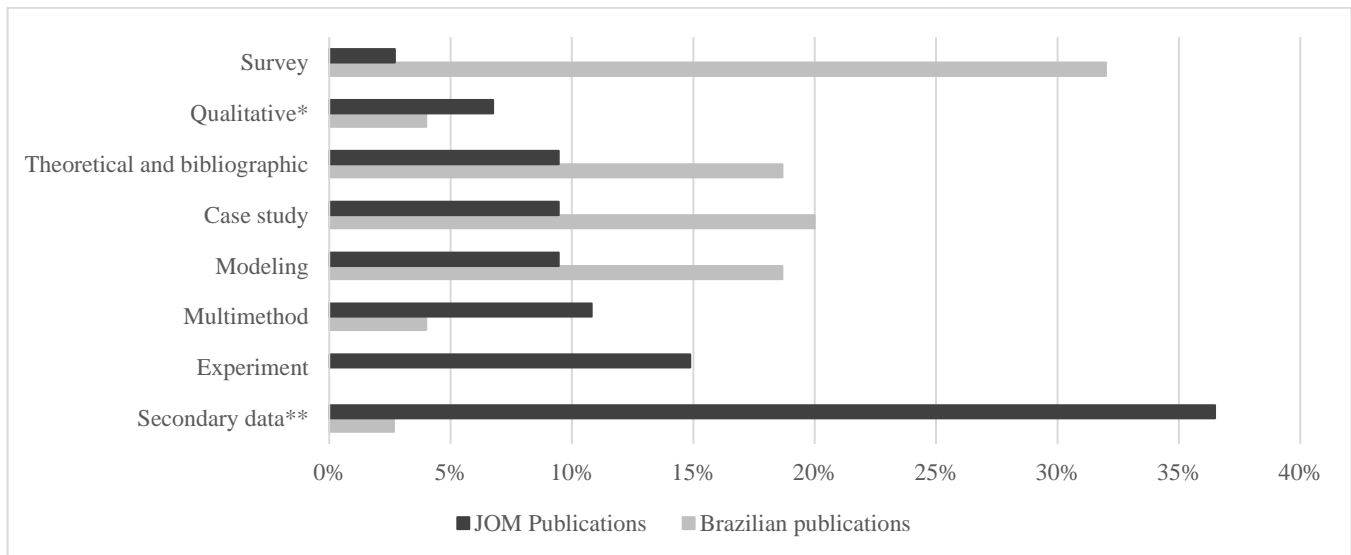


Figure 9. Comparison of the methods used in articles published in national and international journals by researchers from Brazilian universities and in the JOM (2010-2019)

*Note. Other qualitative methods except for the case study and action research.

**Note. Quantitative methods using secondary data.

About the methods adopted in the research, the JOM’s articles employed “quantitative research with secondary data”, “experiments”, and “multimethod research” more frequently than us (Figure 9). Secondary data are employed quite frequently in research on health management, in companies in specific industries, or in those which applied public or private databases. The growth of studies employing experiments, indicated by Paiva and Brito (2013) as a future trend for the field in Brazil. However, we have not yet identified this in our study. Simultaneously, this method is the second most frequent method in the JOM. Last, survey studies, the method most used by Brazilian researchers, have lost representativity among JOM’s publications. Currently, there is a quest to improve this method and increase the level of methodological procedures (Guide Jr & Ketokivi, 2015), which may explain the lower frequency of publication in the JOM.

What can we learn from OSCM conferences?

From the selected conferences, it was possible to identify the main topics employed to group the presentations into thematic sections. We classified the topics in those sections as traditional, consolidated,

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and emerging (Appendix). Then, we group the emerging topics into new technologies applied in companies and supply chain research applied in new contexts (Table 5).

Table 5.
Emerging themes in conferences

Conferences	Emerging themes	Classification
AoM 2019	Digitalization and SC Digitalization and service operations Blockchain	New technologies
EnANPAD 2020	Agriculture SCs Circular Economy Industry 4.0 and innovation in OSCM	New contexts New contexts New technologies
EurOMA 2019	E-business Humanitarian Humanitarian SC and development Changing management Networks Location	New contexts
DSI 2020	Big Data Business Analytics Cyber security Humanitarian OSCM Social Media Analytics Sustainability, CRS, and humanitarian operations	New technologies New technologies New technologies New contexts New technologies New contexts
POMS 2020	Humanitarian operations and crise management Healthcare Analytics Agri-food OSCM Social media and IoT Socially responsible operations Operations management in sports	New contexts New technologies New contexts New technologies New contexts New contexts

The application of new technologies in OSCM appears as a specific topic for thematic sections in four of the five conferences analyzed, especially digital technologies, such as Machine Learning, Big Data, Blockchain, and Internet of Things, Cyber Security, Industry 4.0, and Social Media Analysis, including Facebook, Twitter, LinkedIn, among others. Recent research presents two perspectives regarding the application of new technologies in OSCM. First, many studies seek to understand how the application of those technologies in companies and supply chains changes the traditional relationships and performance indicators. According to Büyüközkan and Göçer (2018, p.157), digitization creates "[...] transformative effects of disruptions across industries, generating new effects in value and network". Moreover, the global

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industry is expected to have up to 26 billion devices connected via the Internet of Things systems, which may further contribute to a greater advance in this technology application.

The second perspective is the application of data generated by those technologies to better understand the functioning of companies and supply chains, especially with Big Data and social media. In the first case, Big Data offers data sets that are larger than the traditional sources used in research, with greater speed of data generation and a variety of collection sources (Russom, 2011). Such characteristics can offer the researcher greater breadth in the evaluation of decision-making. In the second case, social media offers new types of data investigation through data mining by algorithms or in an unstructured way (Rahmani, Chen, Sarhan, Jida, Rifaie & Alhajj, 2014). This type of investigation can shed light on new knowledge useful for the field (Han, Pei & Kamber, 2011).

Among the emerging contexts identified in the scientific conferences analyzed, we highlight the humanitarian supply chains, agri-food chains, and new topics in sustainability, such as circular economy, corporate social responsibility, service operations in sporting events, online business, network organizations, and facility location. The humanitarian chains deserve to be highlighted because it is a context that appears in more than one section in two conferences. According to Dubey, Gunasekaran, Bryde, Dwivedi, and Papadopoulos (2020, p.3), these chains “[...] involve several actors with different skills from different organizations to achieve a common goal: helping people and alleviating suffering”. The pandemic scenario caused by Covid-19 made this type of chain even more important at this point. Brazilian researchers can help to understand this phenomenon and help governments and the population with better management decisions and methods. According to Ivanov and Dolgui (2020), unforeseen events such as the COVID-19 pandemic may not be restricted to the short term, but its effects can change the composition of global supply chains and last for the long term. Therefore, it is considered that research involving the external environment, external shocks, and crises, has great potential for theoretical and practical contributions in the coming years in the OSCM field.

Discussion

Where are We Going? Projecting a Future Research Agenda

Although the practical and theoretical importance of the OSCM field (Shang, Saladin, Fry & Donohue, 2015; Walker, Chicksand, Radnor & Watson, 2015; Choi, Cheng & Zhao, 2016; Choi, Rogers & Vakil, 2020), few studies have examined its scientific production in Brazil (Paiva & Brito, 2013), especially, its recent production. Brazilian researchers should understand the progress of their own field, including shared research perspectives and methodological preferences (Seyedghorban, Samson & Swink, 2021). To project a future agenda, we aggregated our findings from the systematic literature review.

First, although the themes of supply chain management and operations strategy still are the main drives of our research, their share decreased in the last decade. Both articles from our sample and topics of conferences present increasing diversity in themes and methods. Our findings suggest an increasing maturity in the field, with groups of researchers in consolidation working on different topics and applying new techniques and methods in their research. Brazilian researchers should seek for contributing to more specific research topics, engaging with international peers and sharing knowledge and resources.

Research Agenda 1. Brazilian researchers should engage in more specific research topics in their articles.

Second, case studies and surveys were the main applied research methods in the analyzed articles. However, because those methods are largely employed in the OSCM field, journals are increasing rigor and quality standards in their review processes. Our findings point to new methodological approaches that are not consolidated between us, such as secondary data, experiments, and the mix methods approach. The applied methods, case studies and surveys, may not be enough to make our research more relevant, addressing a larger set of issues and questions with stronger social and practical contributions. We considered it an opportunity and a challenge for the Brazilian community.

Research Agenda 2. Brazilian researchers should employ new methodological approaches in their articles.

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Third, our findings suggest sustainable operations emerged as an important theme in international publications for the Brazilian researchers, exploring this theme under the Brazilian unique context. That finding suggests an evolution of our research to a broader perspective, including real-world issues that affect not only supply chains but society and the environment as well. Other research avenues are still not consolidated between us, such as behavioral operations, Big Data and new technologies, corporate social responsibility, agri-food supply chain, and humanitarian chains. Our community should engage to explore these new themes and their specificities concerning our context, such as addressing social and regional issues. The Brazilian context should not be denied or reduced in our research. It should be emphasized, bringing new insights to discussion that could be impossible to emerge from western countries.

Research Agenda 3. Brazilian researchers should explore the national context in their research, bringing new insights to international discussion.

Limitations and Future Research Directions

The study also has limitations that lead to questions for future studies. First, the results were compared with the study by Paiva and Brito (2013). However, the samples from the previous study and this one is not identical. The sample of articles used is now broader, covering a larger number of national and international journals. Thus, despite comparing these two periods, absolute numbers are not comparable between the two studies, but it is possible to compare relative numbers. Also included in this analysis is the journal JOM as a target for worldwide publication and thus serving as a parameter, which was not addressed in the previous study. Given the difference in the samples, there was no analysis of the differences between the past study and the current study, to test whether the differences are statistically significant.

Future research could replicate the current study - based on the filters and keywords reported in the method section - and use small samples and the differences between the samples in the first and second studies to help explain. Also, criteria selection could be adapted to include a larger sample of journals, once there is a limited number of journals in Brazil. Including low strata journals from those guiding lists,

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could bring additional insights to our findings in future research. Another point to note refers to international journals that do not divide operations management and operations research, which explains the greater presence of modeling in these publications. Finally, it would be interesting to identify if Brazilian researchers are leading additional themes in the OSCM field, developing research that points to new insights for our field.

Conclusions

This paper investigated how the OSCM field of research progressed in Brazil and projected future research agendas to our field. Paiva and Brito (2013) have traced the scenario of OSCM in Brazil, proposing new trends and methods that were further employed by our researchers. However, technological, economic, political, and social changes in the last decade brought additional demands to practitioners and researchers. This study expands the understanding of our own field by presenting its growing diversity of topics and methods. It also suggests themes and methods employed on papers published in JOM or presented in our main national and international conferences, indicating potential trends for future research. Therefore, this study provides useful insights for guiding Brazilian researchers in their OSCM studies.

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Appendix

Selection of themes at conferences			
Conference	Traditional themes	Consolidated themes	Emerging themes
AoM 2019	Sustainable operations Buyer-supplier relationship Project management Processes improvement Supply, consumption, and performance Competences and performance Sustainability and performance Supply chain coordination Management and SC	Business platforms and organizational performance HR and organizations Dispersed supply base	Digitization and SCs Digitization and operations in services Blockchain
EnANPAD 2020	Service Operations Management Management of Intra and Interorganizational Relationships Sustainable Operations Management Project management Strategic Operations and Logistics Management	Risk Management and Supply Chain Resilience Global Value Chains & Production Networks	Agricultural and extractive supply chains Circular economy Industry 4.0 and innovation in operations and supply chains
EurOMA 2019	sustainable SCM Performance Strategy SCM Innovation Operations in services Lean Empirical Logistics Relationship logistical performance	Global supply Health Risk Public Behavior operations Risk and resilience S&OP	E-business Humanitarian Humanitarian and development Change management Networks Plant location

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	Teaching Strategy and sustainability Technology management TQM Project management		
DSI 2020	Best practices in teaching and research Decision Science in practice technology management Innovation and new product development Logistics and transport management Manufacturing management Purchasing and Supply Management Project management Quality and Lean Management Operations and service systems Strategic management SCM	Accounting Finance and economy Health management Marketing and Channels Organizational behavior and HR management	Big Data Application Business Analytics Cyber security and systems resilience Humanitarian operations and supply chains Social Media Analytics Sustainability, CRS and humanitarian operations
POMS 2020	Economic models in operations management Information systems Inventory management Manufacturing operations Operational Excellence POM in practice Purchasing and Supply Management Product innovation and technology management Retail operations Revenue and price management Scheduling and logistics Operations in services SCM Sustainable operations Teaching/pedagogy in POM	Operations and Finance Management Health operations management Global SC Management Marketing and Operations Management Public sector operations Risk management in SC Supply networks Operations management behavior	Humanitarian operations and crisis management Healthcare Analytics OSCM in agri-food context Social Media and IoT Socially responsible operations Sports operations management

Submetido: 07/06/2021

Aceito: 08/11/2021