


INVENTORY PLANNING AND CONTROL IN ORGANIZATIONS

PLANEJAMENTO E CONTROLE DE ESTOQUE NAS ORGANIZAÇÕES

PLANIFICACIÓN Y CONTROL DE INVENTARIOS EN LAS ORGANIZACIONES

 <https://doi.org/10.56238/sevened2026.019-062>

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ABSTRACT

The contemporary organizational context is characterized by high levels of competitiveness, dynamic markets, and increasing complexity in logistical operations, which demand greater efficiency in the management of available resources. In this scenario, inventory planning and control play a fundamental role, as they directly impact operational continuity, cost reduction, and customer service levels. In light of this, the general objective of this study is to highlight the strategic relevance of inventory planning and control within organizations, as well as the main methods and techniques employed and their impacts on organizational performance. To achieve these objectives, a qualitative approach was adopted, grounded in bibliographic research. The study was developed based on the analysis of well-established materials in the literature, such as books and scientific articles by recognized authors in the field of logistics and inventory management, enabling the construction of a consistent theoretical foundation on the topic. The findings indicate that supply management professionals must go beyond the operational mastery of control tools and techniques, developing a strategic perspective that enables the integration of inventory data with managerial decision-making and organizational objectives. Such capability constitutes a significant competitive advantage in the current context, marked by the complexity of supply chains and increasing demands for efficiency and agility in operations.

Keywords: Inventory Planning. Inventory Control. Supply Management. Organizational Performance.

RESUMO

O contexto contemporâneo das organizações é marcado por elevados níveis de competitividade, dinamismo dos mercados e crescente complexidade nas operações logísticas, o que exige maior eficiência na gestão dos recursos disponíveis. Nesse cenário, o planejamento e o controle de estoque assumem papel fundamental, uma vez que impactam diretamente a continuidade operacional, a redução de custos e o nível de serviço ao cliente. Diante disso, o objetivo geral desta pesquisa é destacar a relevância estratégica do planejamento e do controle de estoque nas organizações, bem como dos principais métodos e técnicas utilizados e de seus impactos no desempenho organizacional. Para o

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alcance desses objetivos, adotou-se uma abordagem qualitativa, fundamentada em pesquisa bibliográfica. O estudo foi desenvolvido a partir da análise de materiais já consolidados na literatura, como livros e artigos científicos de autores reconhecidos na área de logística e gestão de estoques, permitindo a construção de uma base teórica consistente sobre o tema. Como resultado, a pesquisa evidenciou que o profissional de Gestão de Suprimentos precisa ir além do domínio operacional de ferramentas e técnicas de controle, sendo necessário desenvolver uma visão estratégica que possibilite integrar as informações de estoque às decisões gerenciais e aos objetivos organizacionais. Essa capacidade configura-se como um diferencial competitivo relevante no contexto atual, caracterizado pela complexidade das cadeias logísticas e pela crescente exigência por eficiência e agilidade nas operações.

Palavras-chave: Planejamento de Estoque. Controle de Estoque. Gestão de Suprimentos. Desempenho Organizacional.

RESUMEN

El contexto contemporáneo de las organizaciones se caracteriza por altos niveles de competitividad, dinamismo de los mercados y creciente complejidad en las operaciones logísticas, lo que exige una mayor eficiencia en la gestión de los recursos disponibles. En este escenario, la planificación y el control de inventarios asumen un papel fundamental, ya que impactan directamente en la continuidad operativa, la reducción de costos y el nivel de servicio al cliente. Por lo tanto, el objetivo general de esta investigación es destacar la relevancia estratégica de la planificación y el control de inventarios en las organizaciones, así como los principales métodos y técnicas utilizados y sus impactos en el desempeño organizacional. Para alcanzar estos objetivos, se adoptó un enfoque cualitativo, fundamentado en una investigación bibliográfica. El estudio se desarrolló a partir del análisis de materiales ya consolidados en la literatura, como libros y artículos científicos de autores reconocidos en el área de logística y gestión de inventarios, permitiendo la construcción de una base teórica consistente sobre el tema. Como resultado, la investigación evidenció que el profesional de Gestión de Suministros necesita ir más allá del dominio operativo de herramientas y técnicas de control, siendo necesario desarrollar una visión estratégica que permita integrar la información de inventarios con las decisiones gerenciales y los objetivos organizacionales. Esta capacidad se configura como una ventaja competitiva relevante en el contexto actual, caracterizado por la complejidad de las cadenas logísticas y la creciente exigencia de eficiencia y agilidad en las operaciones.

Palabras clave: Planificación de Inventarios. Control de Inventarios. Gestión de Suministros. Desempenho Organizacional.

1 INTRODUCTION

Supply chain complexity is increasing, demand is fluctuating, and there is intense pressure to reduce operating costs. Inventory planning and control become invaluable strategic functions for organizations of any size and in any domain in this situation.

One of the biggest challenges is the efficient management of inventory among those who are in the purchasing and supply area. Maintaining adequate inventory levels refers to two competing risks: excess (cost of maintaining inventory, leading to storage, obsolescence, and capital immobilization); and scarcity (supply disruptions, lost sales, loss of customers, and dissatisfaction).

Achieving this balance is complicated and depends on the use of strategies, methods, tools, and indicators that will be available to enable accurate decision-making. Faced with this problem, several methods have been developed in recent decades to allow the direct management of inventory sizing to be applied more precisely. Methods such as reorder point, safety stock, ABC analysis, and economic order quantity (EOQ) model are now established benchmarks in materials management.

In addition to the technical level, inventory management has a strategic layer that links the supply part to the organization's overall strategy. Choices about inventory levels affect cash flow, production capacity, and end-user service. Thus, any professional must be able to understand the theoretical and practical basis of inventory planning and control.

The general objective of this research is to highlight the strategic relevance of inventory planning and control in organizations, as well as the main methods and techniques used and their impacts on organizational performance. The specific objectives are as follows: To examine the strategic importance of inventory planning for operational efficiency and decision-making in organizations; Describe and analyze the main methods and techniques of inventory control adopted by organizations; Evaluate the impacts of inventory management on organizational performance, considering indicators such as costs, service level, and competitiveness.

In order to achieve these objectives, a methodology characterized by a qualitative approach was developed and the research procedure used was the bibliographic research, developed based on materials already published, such as books and scientific articles by relevant authors in the area of logistics and inventory management.

This article is structured in four sections. Initially, the introduction presents the theme and explains the objectives of the research. Next, the methodology describes the approach adopted and the procedures used for the development of the study. In the third section, the theoretical foundation is organized into three axes: the strategic importance of inventory planning, the

methods and techniques of inventory control, and the impacts of inventory management on organizational performance. Finally, in the final considerations, the main results are resumed, evidencing the achievement of the proposed objectives, in addition to indicating possibilities for future research.

2 METHODOLOGY

The approach adopted in this work is qualitative, as it seeks to understand the importance of inventory planning and control from the analysis of concepts and theoretical contributions. This type of approach allows for a more in-depth interpretation of organizational phenomena, without the use of numerical data. According to Gil (2020, p.92), "qualitative research aims to understand phenomena from the perspective of the participants and the interpretation of the researcher".

As for the research procedure, bibliographic research was used, developed based on materials already published, such as books and scientific articles by relevant authors in the area of logistics and inventory management. This procedure allows us to gather different theoretical views on the subject. According to Lakatos and Marconi (2021, p. 166), "bibliographic research covers the entire bibliography already made public in relation to the topic of study, allowing the researcher direct contact with what has already been written on the subject".

For the elaboration of this work, five fundamental authors stand out, presented in chronological order of publication: Chopra (2020), Kenneth and Jane Laudon (2020), Christopher (2020), Heizer and Render (2020), and J. Closs and Cooper (2021). These authors contributed significantly to the understanding of inventory management, covering everything from the supply chain to the use of technologies and the impacts on organizational performance.

3 THEORETICAL FOUNDATION

This rationale was organized into three topics. In the first, the importance of inventory planning within organizations was addressed, highlighting its relevance for cost control and for the proper functioning of operations. In the second, some of the main methods and techniques used in inventory control were presented. Finally, in the third topic, the impacts of inventory management on the performance of companies were discussed.

3.1 THE STRATEGIC IMPORTANCE OF INVENTORY PLANNING

Inventory planning is a fundamental activity for any organization that works with physical products. It is directly linked to the company's ability to serve its customers without generating waste or unnecessary costs.

According to Chopra (2020, p. 61), "inventory management directly influences supply chain performance, as it impacts both the level of customer service and operating costs."

In this sense, it is observed that efficiency in inventory management does not depend only on well-structured operational practices, but also on the support of technologies capable of integrating information, reducing uncertainties, and improving decision-making along the logistics chain.

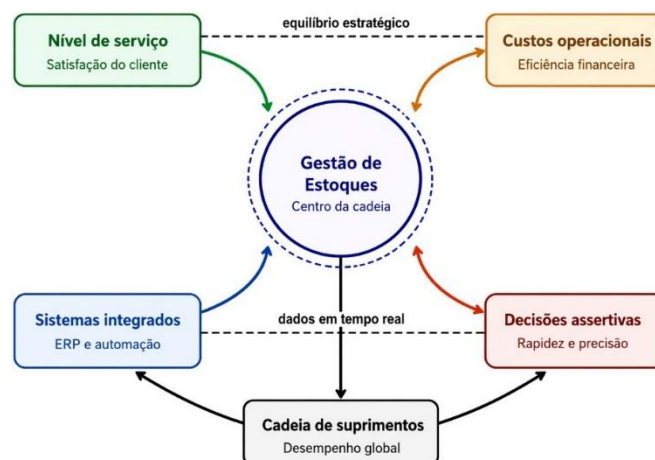
Laudon and Laudon (2020, p. 223) argue that: "Integrated systems help in the efficient management of resources and contribute to faster and more assertive decisions within organizations".

Inventory planning is considered to be directly associated with the overall performance of the organization, since it influences both storage costs and customer service capacity. In this context, it is highlighted that agility in service, especially the reduction of response time to demands, is an essential strategic factor for organizational competitiveness today.

Figure 1 below illustrates the central role of inventory management in balancing customer service level and operating costs, showing how the use of integrated systems and real-time data contributes to more assertive decisions and overall supply chain performance.

Figure 1

Strategic Pillars in the Supply Chain



Source: Reis e Prazeres (2024)

The analysis, presented in Figure 1, clearly and thoroughly emphasizes that inventory management plays an essential and strategic role in terms of supply chain performance. This happens because this administration is responsible for establishing a balance point, that is, it seeks to adequately harmonize the level of service provided to the customer, ensuring that their demands are met, with the operating costs borne by the company.

In this way, efficient inventory management becomes crucial to maximize both consumer satisfaction and the financial effectiveness of logistics processes. It is observed that the integration of different systems and the application of real-time data enhance the ability of institutions to react to different circumstances, culminating in decisions that are not only faster, but also more accurate. This decision-making dynamic proves vital for operational effectiveness as well as speed in the contemporary competitive context. Thus, the combination of these strategies is essential to improve the performance of organizations, enabling them to adapt effectively to the demands that constantly emerge (Zago; Stábile, 2026).

Thus, it is concluded that the adoption of systematic and structured practices aimed at planning and inventory management, when accompanied by appropriate technological support, not only favors the efficiency of operations, but also strengthens the competitiveness and sustainability of the results achieved by organizations over time. This underscores the relevance of an integrated strategy that promotes efficient performance over time.

3.2 INVENTORY CONTROL METHODS AND TECHNIQUES

For inventory to be well managed, companies use different control methods and techniques. Among the best known is the FIFO (First In, First Out), which prioritizes the exit of older products

According to Chopra (2020, p. 74), "the segmentation of inventory items helps in the prioritization of resources, allowing management to be more efficient and focused on the products with the greatest impact".

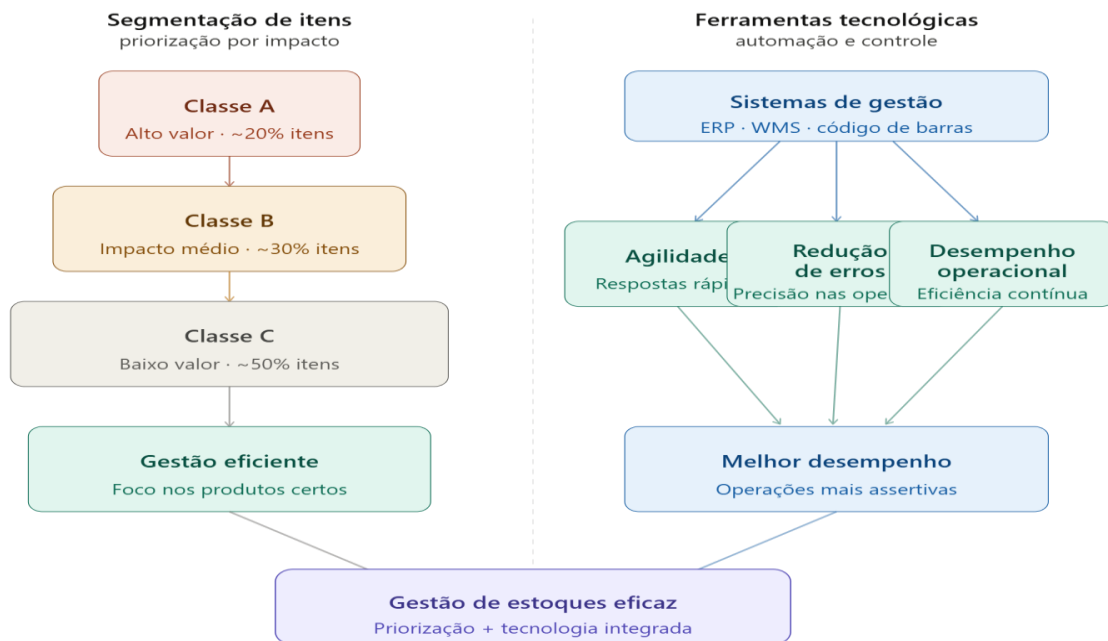
In this context, the definition of priorities based on the relevance of the items requires the support of mechanisms that ensure visibility, control, and agile processing of information, in order to support more accurate decisions aligned with the organization's strategic objectives.

According to Christopher (2020, p. 93), "the use of technological tools in inventory management allows for greater agility, reduction of errors, and better operational performance".

Nowadays, it is considered that inventory control methods and techniques are more than essential, but the human resource assigned to such tasks is still a bottleneck within organizations, especially in execution time.

Figure 2

Integration of the ABC curve with management systems



Source: Santos (2023).

Inventory management is a component of a business operation that strategically positions your business as a driver of system, process, cost, and customer service efficiency. Good control allows you to balance the availability of available product with the reduction of redundant products, so that there is no shortage or waste. ABC analysis and other tools help classify items, and integrated software such as ERP and WMS help ensure information accuracy and agility in operations. Thus, more effective inventory management leads to more assertive operations, better investment of resources, and increased competitive advantage of the business (Bravo, 2024).

3.3 IMPACTS OF INVENTORY MANAGEMENT ON ORGANIZATIONAL PERFORMANCE

The way inventory is managed can directly impact a company's bottom line. When there is good control, the organization can better serve its customers, avoiding delays and product shortages.

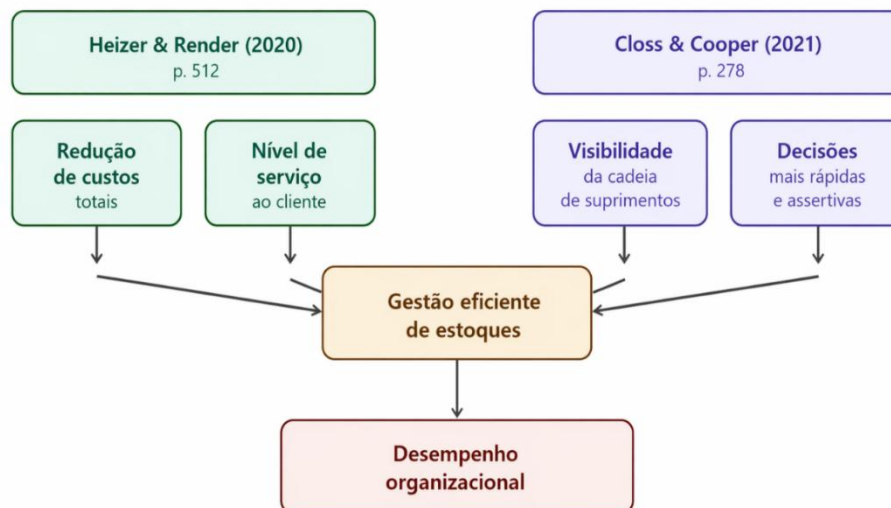
According to Heizer, Render and Munson (2020, p. 512), "efficient inventory management contributes to the reduction of total costs and improves the level of customer service, being essential for organizational performance".

As illustrated in Figure 3, effective inventory management is linked to the organization's performance, according to Heizer and Render (2020) and Closs and Cooper (2021). Of course,

good inventory management decreases total costs and increases the level of customer service, as well as increasing supply chain visibility and enabling faster and more accurate decisions. The figure, therefore, summarizes how the union of these elements translates into more effective management, directly reflecting on the results and competitiveness of companies.

Figure 3

Contributions of inventory management to organizational performance in the light of the literature



Source: Heizer and Render (2020); Closs and Cooper (2021)

According to Closs and Cooper (2021, p. 278), "proper inventory control provides greater visibility of the supply chain, allowing for faster and more assertive decisions."

It is considered that all Methods and Techniques of inventory control add to the final result, contributing to the Effectiveness of inventory control, it is necessary to have a management where it can be measured and monitored and evaluated.

As illustrated in Figure 3, effective inventory management is linked to the organization's performance, according to Heizer and Render (2020) and Closs and Cooper (2021). Of course, good inventory management decreases total costs and increases the level of customer service, as well as increasing supply chain visibility and enabling faster and more accurate decisions. The figure, therefore, summarizes how the union of these elements translates into more effective management, directly reflecting on the results and competitiveness of companies.

Figure 3 emphasizes that effective inventory management is a key component to the organization's performance. From the contributions of Operations Management, it can be seen that proper inventory control strategies reduce overall costs and improve customer service

levels. Inventory management provides the organization with more visibility into its supply chain and facilitates faster and more assertive decisions from a Supply Chain Management point of view. Thus, when these components are effectively integrated, it leads to more effective management and has a positive influence on the results and competitiveness of organizations.

4 FINAL CONSIDERATIONS

The final considerations of this study reaffirm that inventory planning and control are no longer understood as strictly operational activities, assuming a fundamental strategic role for the sustainability and competitiveness of organizations.

In the light of the theoretical foundation developed, it is evident that efficient inventory management is not limited to the monitoring of product inputs and outputs, but requires the adoption of structured practices and consolidated methodologies, such as ABC Curve, FIFO, Economic Purchase Lot (EOQ) and safety stock. In addition, the relevance of technological support is highlighted, through integrated systems, such as ERP and WMS, which enhance the accuracy of information, traceability and agility of decision-making processes.

In this context, it is observed that the impacts of inadequate inventory management go beyond the operational limits of the warehouse, directly reflecting on the financial performance, the level of customer service and the organization's ability to adapt to variations in demand.

The imbalance between excess and shortage of products is, therefore, a significant risk to the efficiency of the supply chain. In addition, there is a need for integration between inventory planning and other organizational areas, such as purchasing, production, logistics and finance, considering that isolated decisions tend to generate systemic inefficiencies. Thus, the adoption of an integrated view of the supply chain is an essential requirement for obtaining consistent and predictable results in inventory management.

In view of what has been exposed throughout this study, it is verified that the general objective was fully achieved, by evidencing the strategic relevance of planning and inventory control in organizations, as well as by demonstrating the importance of the main methods and techniques applied and their impacts on organizational performance.

In a complementary way, the specific objectives were also met, since the importance of inventory planning for operational efficiency and decision making was analyzed, widely used methodologies were described and examined, such as the ABC Curve, FIFO, EOQ and safety stock, in addition to consistently evaluating the effects of inventory management on fundamental indicators, such as costs, service level and competitiveness.

Finally, it is emphasized that the Supply Management professional must develop not only operational skills related to the use of control methodologies and instruments, but also a strategic understanding capable of articulating inventory data to managerial decisions and organizational objectives. Such competence is a relevant differential in the contemporary scenario, marked by high logistical complexity and growing demands for efficiency and responsiveness.

As a proposal for future investigations, it is suggested to carry out empirical studies that analyze the practical application of inventory management techniques in different economic sectors, allowing the comparison of results and the identification of best practices.

In addition, it is recommended to deepen the analysis of the role of emerging technologies, such as artificial intelligence, big data, and the Internet of Things (IoT), in the optimization of inventory control processes and supply chain integration. It is also pertinent to investigate the relationship between inventory management and sustainability, considering aspects such as waste reduction and efficiency in the use of resources, thus expanding the understanding of the strategic impacts of this area in the contemporary context.

REFERENCES

- Alderman, K., Turner, L. R., & Tong, S. (2012). Floods and human health: A systematic review. *Environment International*, 47, 37–47. <https://doi.org/10.1016/j.envint.2012.06.003>
- Charnley, G. E. C., et al. (2021). Traits and risk factors of post-disaster infectious disease outbreaks: A systematic review. *Scientific Reports*, 11(1), 5616. <https://doi.org/10.1038/s41598-021-85146-0>
- BIREME, Pan American Health Organization, & World Health Organization. (2024). DeCS: Health Sciences Descriptors. <http://decs.bvsalud.org/>
- Díaz-Delgado, C., & Gaytán-Iniestra, J. U. A. N. (2014). Flood risk assessment in humanitarian logistics process design. *Journal of Applied Research and Technology*, 12(5), 976–984. [https://doi.org/10.1016/S1665-6423\(14\)70604-2](https://doi.org/10.1016/S1665-6423(14)70604-2)
- Du, W., et al. (2010). Health impacts of floods. *Prehospital and Disaster Medicine*, 25(3), 265–272. <https://doi.org/10.1017/S1049023X00008141>
- Fernandes, G. C. M., et al. (2019). Primary health care in disaster situations: A systematic review. *Pan American Journal of Public Health*, 43. <https://doi.org/10.26633/RPSP.2019.76>
- Freitas, C. M., & Ximenes, E. F. (2012). Floods and public health: A question in the recent scientific literature on causes, consequences and responses for prevention and mitigation. *Ciência & Saúde Coletiva*, 17, 1601–1616. <https://doi.org/10.1590/S1413-81232012000600023>

- Lamberti-Castronuovo, A., et al. (2022). Primary health care disaster preparedness: A review of the literature and the proposal of a new framework. *International Journal of Disaster Risk Reduction*, 81, 103278. <https://doi.org/10.1016/j.ijdr.2022.103278>
- Liang, S. Y., & Messenger, N. (2018). Infectious diseases after hydrologic disasters. *Emergency Medicine Clinics*, 36(4), 835–851. <https://doi.org/10.1016/j.emc.2018.07.002>
- Liu, Q., et al. (2023). Association of natural flood disasters with infectious diseases in 168 countries and territories from 1990 to 2019: A worldwide observational study. *Global Transitions*, 5, 149–159. <https://doi.org/10.1016/j.glt.2023.09.001>
- Manandhar, B., et al. (2023). Urban flood hazard assessment and management practices in South Asia: A review. *Land*, 12(3), 627. <https://doi.org/10.3390/land12030627>
- US National Library of Medicine. (2023). MeSH: Medical Subject Headings. www.nlm.nih.gov/mesh
- Munn, Z., et al. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18, 1–7. <https://doi.org/10.1186/s12874-018-0611-x>
- Newman, G., et al. (2022). A framework for evaluating the effects of green infrastructure in mitigating pollutant transferal and flood events in Sunnyside, Houston, TX. *Sustainability*, 14(7), 4247. <https://doi.org/10.3390/su14074247>
- Ouzzani, M., et al. (2016). Rayyan: A web and mobile app for systematic reviews. *Systematic Reviews*, 5, 1–10. <https://doi.org/10.1186/s13643-016-0384-4>
- Patz, J. A., Grabow, M. L., & Limaye, V. S. (2014). When it rains, it pours: Future climate extremes and health. *Annals of Global Health*, 80(4), 332–344. <https://doi.org/10.1016/j.aogh.2014.09.007>
- Peters, M. D. (2016). In no uncertain terms: The importance of a defined objective in scoping reviews. *JBI Evidence Synthesis*, 14(2), 1–4. <https://doi.org/10.11124/jbisrir-2016-2838>
- Salvati, P., et al. (2018). Gender, age and circumstances analysis of flood and landslide fatalities in Italy. *Science of the Total Environment*, 610, 867–879. <https://doi.org/10.1016/j.scitotenv.2017.08.064>
- Salvati, P., et al. (2021). Acquiring vulnerability indicators to geo-hydrological hazards: An example of mobile phone-based data collection. *International Journal of Disaster Risk Reduction*, 55, 102087. <https://doi.org/10.1016/j.ijdr.2021.102087>
- Silva, E. L., et al. (2021). Public health emergency due to floods: The performance of the Ministry of Health in occurrences in Brazil from 2004 to 2017. *Saúde em Debate*, 44, 176–187. <https://doi.org/10.1590/0103-11042020E212>
- Sweileh, W. M. (2019). A bibliometric analysis of health-related literature on natural disasters from 1900 to 2017. *Health Research Policy and Systems*, 17, 1–11. <https://doi.org/10.1186/s12961-019-0418-1>

- Theron, E., et al. (2022). Climate change and emergency care in Africa: A scoping review. *African Journal of Emergency Medicine*, 12(2), 121–128. <https://doi.org/10.1016/j.afjem.2022.02.003>
- Tin, D., et al. (2024). Natural disasters: A comprehensive study using EMDAT database 1995–2022. *Public Health*, 226, 255–260. <https://doi.org/10.1016/j.puhe.2023.11.017>
- Tricco, A. C., et al. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, 169(7), 467–473. <https://doi.org/10.7326/M18-0850>
- Van den Akker, O. R., et al. (2023). Generalized systematic review registration form. *MetaArXiv*. <https://doi.org/g5fj>
- World Health Organization. (2001). *The world health report 2001: Mental health: New understanding, new hope*. <https://books.google.com.br/books?hl=pt-BR&lr=&id=GQEdA-VFSIgC>
- Xu, D., et al. (2018). Influences of risk perception and sense of place on landslide disaster preparedness in southwestern China. *International Journal of Disaster Risk Science*, 9, 167–180. <https://doi.org/10.1007/s13753-018-0170-0>
- Zhong, S., et al. (2018). The long-term physical and psychological health impacts of flooding: A systematic mapping. *Science of the Total Environment*, 626, 165–194. <https://doi.org/10.1016/j.scitotenv.2018.01.041>