Proceedings of the 5th European International Conference on Industrial Engineering and Operations Management
Rome, Italy, July 26-28, 2022

Exploring Barriers and Facilitators to Lean Implementation in Healthcare Organizations

Camila Melo
Doctoral Student
University of Sao Paulo
Sao Paulo, Brazil
camilacorreamelo@usp.br

Fernando Berssaneti
Professor of Industrial Operations and Industrial Management
University of Sao Paulo
Sao Paulo, Brazil
fernando.berssaneti@usp.br

Gabriel Rampini
Doctoral Student
University of Sao Paulo
Sao Paulo, Brazil
gabrielrampini@usp.br

Izabelle Martinez
Masters Student
University of Sao Paulo
Sao Paulo, Brazil
martinez.izabelle@outlook.com

Abstract

In the quest to improve the quality of health services and ensure more excellent patient safety, healthcare institutions look for alternatives that could help them achieve this goal. The Lean methodology has been a solution found by these organizations. This study has explored through Lean healthcare literature i) main barriers and facilitators to implementing the Lean approach into healthcare service organizations, and ii) practices and tools of Lean used to improve them continuously. One hundred two documents retrieved from Scopus and Web of Science databases were analyzed to reach the search goals. Through content analysis, the main barriers to Lean program implementation within healthcare institutions are related to resistance to change, low level of staff involvement, firm commitment to a cultural change, departments working in a silo approach, and misunderstanding of Lean concepts and its benefits. On the other hand, the main facilitators are support and engagement by leadership, training, and development of workers, and cross-functional collaboration. This study also contributes to labeling the most frequent Lean practices and tools – value stream mapping, fishbone diagram, and SIPOC. The findings of this research provide practical implications since the barriers and facilitators raised from the literature will support healthcare professionals in their Lean healthcare journey in their organizations and consequently improve their competitiveness through a high level of efficiency, quality of care, and practitioner satisfaction.

Keywords
Lean production, Healthcare, Lean Healthcare, Barriers, Facilitators.

1. Introduction

The increasing patient demand, limitation or inappropriate usage of resources (e.g. material or equipment), and inefficient patient flow are some problems faced by healthcare institutions. These issues contribute to the reduction in quality of health services, damage to the safety and satisfaction of the patient, and consequently compromise the financial performance of an organization (Sánchez et al. 2018; Tlapa et al. 2020; Kam et al. 2021).

In the current scenario of COVID-19, healthcare organizations have been pressured and challenged by the achievements of efficiency improvements to meet the growing demand that may guarantee acceptable levels of quality at low costs. In addition, the pandemic crisis has exposed the inefficiency of global health management (Bharsakade et al. 2020). In this way, facing by challenges and pressures of the current economy, the Lean Six Sigma methodology has supported healthcare institutions in the continuous improvement of the delivery of their services and, consequently, being value-based healthcare (Kam et al. 2021). Although studies about Lean have been largely explored in the industrial context, there are not many studies that detail critical factors of Lean (e.g. barriers, drivers) in the healthcare field (Costa et al. 2015 2017). Therefore, this subject is relevant to be explored by literature, contributing to this study field in view of the healthcare sector to lead and summarize insights about implementation and sustainable practices of Lean healthcare. Consequently, to explore the theme of Lean healthcare; this work proposes to answer the following research questions:

(a) "What are the main barriers to overcome while implementing Lean philosophy in the healthcare sector?"
(b) "What are the facilitating factors that collaborate to implement Lean healthcare and overcome barriers?
(c) “What are the main Lean tools and techniques used?”
(d) "What are the main results achieved by implementing Lean in healthcare institutions?"

This article is structured into four sections. Section 1 is the introduction and presents the subject of discussion, the study's objectives, and the fundamental concepts of "Lean healthcare". Section 2 is the methodology and illustrates the articles' selection process. Section 3 shows the main results and discussion of relevant findings. Section 4 is the conclusion and presents the final considerations, limitations, and future research.

1.1 Lean Healthcare

Lean thinking is a strategy used by organizations to achieve competitiveness as waste in processes is identified and eliminated, allowing the flow of processes to be continuous and with minimal variations (Womack and Jones 1996). Its foundations return to the Toyota Production System (TPS), which focused on eliminating waste (Ohno, 1988; Womack and Jones 1996). Moreover, waste is understood as all those activities that consumers are unwilling to pay for and do not add value to the product or service from the consumer's perspective (Womack and Jones 1996). The authors classified seven types of waste: defects, transportation, motion, inventory, waiting, overproduction, and overprocessing.

Womack and Jones (1996) highlighted five Lean principles to support waste reduction: value, value stream, flow, pull, and perfection. Liker (2004) also proposed 14 principles for Lean grouped into groups: philosophy (long-term thinking), process (eliminating waste), people and partners (respect and development of people), and problem-solving (continuous improvement). Based on those principles, the Lean approach promotes a new way of thinking about processes and drives an organizational culture focused on efficiency and quality; for this to be possible, it requires a change and participation of all people and all levels of the organization (Graban 2016).

Recently, Lean thinking has been applied beyond the manufacturing environment and found the healthcare sector fertile for development. It contributes to delivering better quality healthcare services at a lower cost (Jones and Mitchell, 2006), helps in developing more efficient, competitive, and patient-centered processes (Daultani et al. 2015), and improves patient satisfaction (Hallam and Contreras 2018), and then leads to sustainable organizational results.

In the literature, abundant cases of Lean in healthcare fields are available. However, many of them present specific applications of tools such as in Kam et al. (2021) to reduce the time of care in a public ophthalmology clinic; in Sakthivelmurugan et al. (2021) to decrease material consumption within a hospital ward; in Zhu et al. (2020) to minimize the cancellation rate of surgeries, among others. Some other studies reinforce the opportunity to investigate the sustainability and implementation of Lean in health institutions (e.g. D'Andreamatteo et al. 2015; Antony et al., 2019; Morell-Santandreu et al. 2020) in a general way. Additionally, some works did a literature review literature

about Lean healthcare. Still, they scarcely explored the main barriers and facilitators of implementing Lean healthcare. They primarily focused on presenting or discussing an overview or results from this implementation and applications (e.g. Andersen et al. 2014; Rees and Gauld 2017). Based on that, it reinforces the need for research about critical factors such as barriers and facilitators to implementing Lean in healthcare institutions and the significant gains throughout its implementation process.

2. Methodology

This paper conducted a narrative literature review following a systematic procedure to raise the sampling articles. Two databases were considered – Web of Science and Scopus – since they are the most broadly consulted databases for systematic investigations (Singh et al. 2021). The search strings included: ("Lean manufacturing" OR "Lean production" OR "Toyota production system" OR "Lean healthcare") AND ("healthcare" OR hospital OR "health care"). The initial sample extracted 1013 documents: 689 papers from Scopus database and 324 from Web of Science database. After that, filters of document types (article and review) and language (English and Portuguese) were defined, and from the total documents, only 568 documents were considered for the next steps. The metadata in both databases was consolidated using R, which removed 157 duplicated documents. This paper considered articles until March 28 of 2022.

The 411 remaining papers were analyzed based on title and abstracts, and authors reached a common understanding of 151 papers, while 260 papers were excluded from the sample. After full read, the reminiscent articles (151), only 102 articles were considered to following analysis. Those articles that did not bring any barrier or facilitator (37) or were not available for full reading (12) was excluded. Figure 1 described the sampling process flow. It considers both qualitative and quantitative studies. After extracting the final sample, the next step was to employ a content analysis and identify the barriers and facilitators to Lean implementation, as well as the main Lean tools and practices found in the literature and most cited gains from implementing Lean within healthcare institutions.

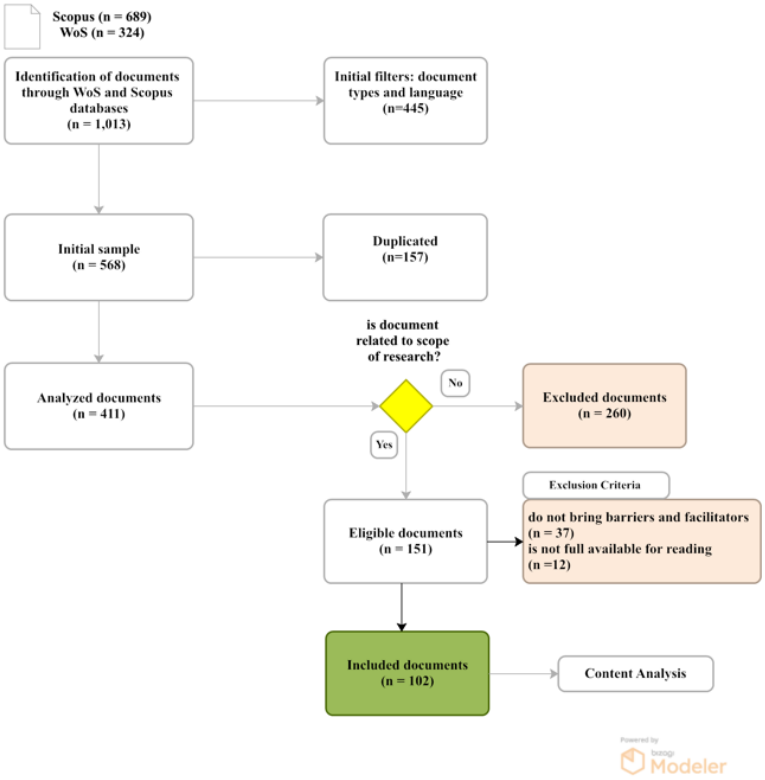

Figure 1. Sampling process flowchart

3. Results and Discussion

3.1 Barriers to Lean Implementation

Organizations that deliver healthcare services have faced difficulties in successfully achieving sustainable results from Lean healthcare implementation. Therefore, forty potential obstacles to Lean implementation in the healthcare context were raised from the final sampling documents to understand what kind of barriers those organizations have to deal with. The most cited barrier was the resistance and reluctance of workers to change their habits (11 studies), especially among professionals who are afraid of using new technology and believe in the "usual way" to get things done (Regis et al. 2018 2019; Zdęba-Mozoła et al. 2022). Likewise, the fear of losing jobs had impended clinical workers to fully embrace the Lean healthcare program, since they believe that through continuous improvements of processes, their duties may not be required (3 studies) (Fournier and Jobin, 2018). Then, it promotes no firm commitment and a low level of staff engagement to address the culture for change in healthcare operations (4 studies) (Peimbert-García et al., 2021). Additionally, as quoted by Costa et al. (2017), there is an objection to implementing the Lean culture in a hospital organization due to Lean origins being based in the manufacturing sector (4 studies). Still, Poksinska (2010) added that most of the experts come from industrial field and they do not have experiences about the problems of healthcare sector.

Furthermore, the level of staff and leaders' involvement (6 studies) was mentioned as another significant obstacle to doing well in Lean healthcare practices, mainly by ignorance of new concepts, lack of understanding of potential benefits of Lean changes and scarce familiarity with Lean activities (5 studies) (Fournier et al. 2021). Related to leadership, Siqueira et al. (2019) emphasize the lack of a management model that focuses on the process of continuous improvement in a healthcare institution, and a leadership style to support people throughout this process. Those factors could cause emotional stress between patients, staff and medical professionals besides distrust of the applied changes (Tortorella et al. 2020). Complementary to management practices, another relevant barrier was the "top-down" strategy (2 studies), in which the vast majority of projects are imposed by managers and have to be closed in a short time (Fournier et al. 2021; Sales and De Castro 2021; Peimbert-García et al. 2021). It also fosters a stressful and uncooperative culture within a healthcare organization. Moreover, some projects just meet the specific needs of a particular department and do not consider the hospital as a whole, in other words, healthcare fields had followed a silo approach (6 studies) (Ankrum et al. 2019). Consequently, it promotes limited and fragmented communication (3 studies), and results in poor quality of communication about Lean's achievements (Zdęba-Mozoła et al. 2022).

Another barrier that authors frequently cited is associated with the low level of professionals' education and training (6 studies) (Marsilio et al. 2022), and, related to this, the lack of experienced or skilled workers in Lean methodology (1 study) (Crema and Verbano 2015). As a result, those factors could prompt doubts about the functional changes arranged by the Lean program within healthcare fields (Warin and Bishop 2010) and the real need of implementing Lean improvements in hospital service, where those changes could mean a high level of risks to patients' care (Kovach et al. 2008).

Concerning the organizational structure of healthcare organizations, Hultman et al. (2016) and Zdęba-Mozoła et al. (2022) discussed the high complexity of a hospital as a challenge to initiate practices of Lean in a healthcare organization. It was related to various configurations of space and rooms, many specialties, and diverse people, including patients and workers (3 studies). Besides that, some authors featured that operators also have some difficulties to identifying valued activities by different stakeholders of the healthcare supply chain (Crema and Verbano 2015), which promotes some conflicts of interests between them (Costa et al. 2016). In addition, frustration with previous attempts of implementing Lean healthcare is cited as a barrier (Hultman et al. 2016), it means that if a hospital had already tried to introduce Lean practices, but failed or did not achieve the goals or found more difficulties than benefits through the process, it may highlight the feeling of distrust or disapproval.

The availability of data for implementing and conducing Lean projects was another significant theme discussed by the authors. It promotes poor organizational information and communication about the Lean initiatives (Fournier and Jobin, 2018). For example, Latessa et al. (2021) revealed that hospital struggles with a lack of data or information, for this reason, they have faced problems all along driving their Lean project. Besides, healthcare organizations do not perceive how support processes or departments, such as IT or human resource, could work synergistically to get better results from Lean applications (Crema and Verbano 2015). It means that some support areas are currently doing their

routine activities and do not participate and contribute to the continuous improvement process within their healthcare organization. Besides that, organizations do not know how to integrate these areas into the Lean activities.

Additionally, the cultural barrier is a threat to be overcome by hospitals, mainly a hierarchical structure with doctors as an influential decision-makers in a healthcare institution (Drotz and Poksinska 2014). Physicians also think that Lean changes might impact medical practices (Fournier et al. 2021) and reduce their choice of autonomy by overly standardizing their work (Warin and Bishop 2010). Carter et al. (2012) noticed that other healthcare workers feel less pleased to propose their idea when physicians held a meeting. It can be seen as a challenge to Lean implementation since one of the principles of this approach is to promote an environment where everyone feels comfortable contributing to continuous improvement in an organization.

Finally, despite not being among the most cited, financial limitations are also mentioned as a problem to implement Lean (2 studies), because those resources such as people, materials, and equipment are limited to implementing Lean in a healthcare environment (Tortorella et al 2020). Moreover, there is a high cost to hiring Lean expertise to develop and participate in Lean workshops at hospitals (Ng et al. 2010).

As raised, most barriers are related to cultural and training factors. Workers are afraid about changes that Lean could promote to medical practices in a healthcare organization and are unfamiliar with Lean activities and concepts. These challenges might initiate other barriers, such as lower commitment, resistance, and inadequate communication that could hinder the development of Lean healthcare culture. The leadership also assumes a relevant role in the Lean implementation process. Finally, identifying and recognizing those barriers to Lean implementation within healthcare organizations is essential to better focus efforts and their limited resources (e.g. people, material, financial), and develop practical actions to overcome them. Then, these institutions could achieve higher operational results in their processes, besides supporting the organizational strategic goals. Against these barriers, drivers were identified to facilitate Lean implementation.

3.2 Facilitators to Lean Implementation

The following analysis explored the facilitators to overcome the previously discussed barriers. Those factors may help healthcare institutions to implement Lean practices and consequently achieve improvements to their operations. Through a systematic review of sampling articles, fourth-four enablers were labeled. Firstly, it was identified that one of the primary motivators for Lean implementation in hospitals is the leadership engagement, support, and commitment to the new approach (28 studies) (Kovach et al. 2008; Patri and Suresh 2017; Peimbert-García et al. 2021; Marsilio et al. 2022). Lean leaders should act as coaches rather than "firefighters" (Braaten and Belhouse 2007). Still, they take a fundamental role in perceiving Lean healthcare as a long-term investment rather than a quick solution for major organizational issues (Mehdi and Bahrani 2017), as well as in promoting the values and purpose of Lean to teams within a healthcare organization (Warin and Bishop 2010). It is consonant with the previously mentioned barrier of a low level of leadership commitment that compromises the success of Lean implementation. Thus, engaging the leadership in the Lean process is not only relevant but also necessary.

The second most pointed facilitator is team training (26 studies). This enabler is in accordance with the previously cited barrier related to lack of training and education, so it reiterates the importance of employees' qualification on Lean methodology and continuous improvement tools to develop and build competencies and expertise that may engage them through the process of Lean implementation. It means that providing all staff with basic training about Lean and quality improvement concepts helps to eliminate bias and give a deep understanding of continuous improvement methodology (Newell et al. 2011; Carter et al. 2012; Costa et al. 2016; Fournier et al. 2021). Besides, staff recognition and rewards also produce advantages to succeed in implementing a Lean program at a healthcare institution (Prado-Prado et al. 2020; Marsilio et al. 2022).

In addition, integrating different people through a cross-functional team (23 studies) was the third most cited enabler, and it is quoted as a relevant motivator to the success of Lean healthcare implementation. It allows collaboration and involvement among various staff (e.g. administrators, physicians, nurses, pharmacists), and they cooperatively work on solving a problem in a healthcare institution (Nicholas 2012; Gonzalez-Aleu et al. 2018; Régis et al. 2019). Simultaneously, it helps to break silos between departments and promote effective communication within the organization. Nino et al. (2020) added that solutions should go "beyond departmental boundaries". Besides this, support from experts and various departments in the hospital is a recurring theme (17 studies). It could be a well-experienced consultant (Patri and Suresh, 2017; Peimbert-García et al. 2021), a process engineer as a member (Sales

and De Castro 2021), a scientific staff (e.g. academics) (Rao et al. 2021; Bhat et al. 2022) or active participation of informational technology professional. These experts can help develop new processes and implement the Lean program (Henrique et al. 2021) by teaching Lean practices, properly using Lean tools, and following a structured methodology for organizational improvements (Furterer 2018; Reponen et al. 2021).

Another frequent theme raised by sampling articles was the relevance of creating a culture to Lean. It could be achieved by setting Lean program teams (10 studies). Besides conducting continuous improvement projects, they would be responsible for spreading the Lean concepts within the organization and accomplishing new practitioners (Matos et al., 2016). The authors also highlighted the importance of empowering workers in the decision process within a "blame-free environment" (7 studies). This factor might help to build up a culture where people feel engaged in changes more than just being part of another program that the organization is trying to implement (8 studies) (Sunder et al. 2020; Sales and De Castro 2021), and consequently encourage workers to state their suggestion.

Additionally, institutions should develop a disciplined approach of continuous improvement, following a step-by-step methodology, such as PDCA or DMAIC (12 studies) (Graban and Padgett 2008). This approach might give a clear definition of Lean and its objectives and goals (4 studies), define an interval to monitor the performance of the Lean program (ex. telemonitoring, meetings) (Furterer 2018; Rao et al. 2021) and hiring the right person to right project (Trakulsunti et al. 2021; Bhat et al. 2022). This person has to have clearly defined responsibilities and roles. These enablers would be alternatives to overcome the challenge of low levels of commitment and mistrust in healthcare organizations about Lean programs.

The alignment between organizational strategy and Lean approach is a topic recurrently cited as a prominent facilitator to successfully overwhelm the challenges of Lean implementation in healthcare operations (10 studies). In other words, a Lean program needs to be inserted into hospital strategic planning with goals and a comprehensive definition of gains promoted (Fournier and Jobin 2018; Trakulsunti et al. 2021). Gonzalez-Aleu et al. (2018) also added that members of an organization should be engaged in strategic planning development to bring the Lean objectives and perspectives to the strategic level, and this involvement should be in the early stages. Thus, it is a two-way information flow – healthcare organizations, through strategy, should communicate what mission and goals aim to achieve and how Lean programs could collaborate on this at the same time that Lean healthcare enlightens its objectives, priorities, and constraints.

A repeated subject discussed among researchers as an enabler to implementing Lean programs in hospitals is the collaboration of physicians (4 studies). This driver is correspondent with the barrier that doctors are "dominant decision-makers" in healthcare organizations (Drotz and Poksinska 2014), and it strengthens the role of engaging doctors to Lean process to achieve the success of Lean implementation. Since physicians play an important role in the healthcare service delivery process, it is essential to get them involved in the Lean journey. Then, they might easily show commitment to changes (Warin and Bishop 2010), and perceive that they will benefit from the changes accomplished by Lean healthcare. Furthermore, the hierarchical structure of a hospital, dominated by physicians, should break down in that way to create a climate of trust and collaboration that move beyond specific groups' boundaries (Furterer 2018; Peimbert-García et al. 2021). The authors reiterate the promotion of a no hierarchical organizational structure, which means gathering a horizontal and unanimous arrangement within the organization (4 studies) (Régis et al. 2018).

Consistent with the barrier related to lack of data, the availability of data, data trustworthiness, and structured data collections are pointed out in some papers as relevant facilitators to conducting Lean healthcare into a health care service (4 studies) (Kovach, Torres and Walker 2008; Drotz and Poksinska 2014; Furterer 2018). These factors mainly cooperate that organizations could follow a structured approach to identify their problems, prioritize them, and monitor and control their project progress. Thus, with data, those organizations could be more straightforward and assertive in their analysis and action plans.

As previously mentioned, healthcare organizations are complex and involve many processes and departments. Therefore, conducting Lean projects in different areas could be challenging and not attain the expected results, resulting in frustration and mistrust. To surpass this barrier, Carter et al. (2012) and Marsilio et al (2022) suggested introducing Lean initiatives within a simple process or department in a hospital. Then, based on its successes, it could be transposed to other departments. It means that healthcare organizations may not rush on the initial phases of Lean implementation, focusing on small and single changes. They could avail by examples of success to disseminate the

Lean activities through healthcare services. Furthermore, benchmarking and practice sharing are favorable factors to initiate Lean practices in an institution that delivers healthcare services (Bhat et al. 2022), since the organizations could be considered a model to be followed and learned from these experiences.

Finally, other enablers that were mentioned include: identifying all stakeholders in a healthcare setting and defining what values are for them to communicate appropriately and then avoid conflicts (5 studies), applying the Lean tools (2 studies) correctly, and adjusting them to different contexts (e.g. large hospital, clinics, laboratories) (4 studies), involving support areas such as IT to participate of investigations in Lean programs and build together solutions (2 studies), and translate manufacturing language of Lean into a healthcare language (1 study),

In summary, from the previous discussions, it appears that barriers and facilitators complement each other. Most cited barriers and facilitators are related to the involvement of leadership and engagement of workers in the continuous change process within a healthcare service organization. Table 1 summarizes in an orderly way the most cited barrier and facilitators previously discussed in implementing Lean healthcare.

Table 1. Ranking of most cited barriers and facilitators

Rank	Barriers	Rank	Facilitators
#1	Resistance to change habits and fear of the unknown. (11 studies)	#1	Leadership engagement, support and commitment. (28 studies)
#2	Low level of staff involvement and management. (6 studies)	#2	Team training, workshops, and theoretical and job training. (26 studies)
#2	Departments work in a silo approach. (6 studies)	#3	Cross-functional collaboration or multidisciplinary team. (23 studies)
#2	Low level of staff training and education. (6 studies)	#4	Trained Lean coach or expert support. (17 studies)
#3	Misunderstanding of Lean and its potential benefits. (5 studies)		Disciplined approach to continuous improvement. (12 studies)
#4	No firm commitment to a cultural change. (4 studies)	#5	Lean program team. (10 studies)
#4	Resistance about origins of Lean (4 studies)	#6	Linking Lean program to hospital's strategy. (10 studies)
#5	Fear to lose jobs or something. (3 studies)	#7	Employees' commitment to change. (8 studies)

3.3 Tools of Lean Healthcare

Another performed analysis was identifying the leading Lean tools and practices used by the documents. According to Marsilio et al. (2022), those tools and techniques are essential to Lean implementation in a hospital. Thirty-one tools were cited by papers at least once. Figure 2 illustrates the frequency of occurrence of these tools. This figure shows that the most mentioned tool was Value Stream Mapping (VSM), corresponding to 14.12% of articles. This tool helps organizations find non-value-added activities by mapping material and information flow. Then it might provide high-quality patient care and health care efficient processes. The second most cited was the fishbone diagram (7.91%), which enables the team to analyze a problem and identify the possible root causes, followed by SIPOC and 5S, each one with 6.21%. Most tools encourage institutions to identify and analyze their problems to minimize waste and achieve higher operational efficiency.

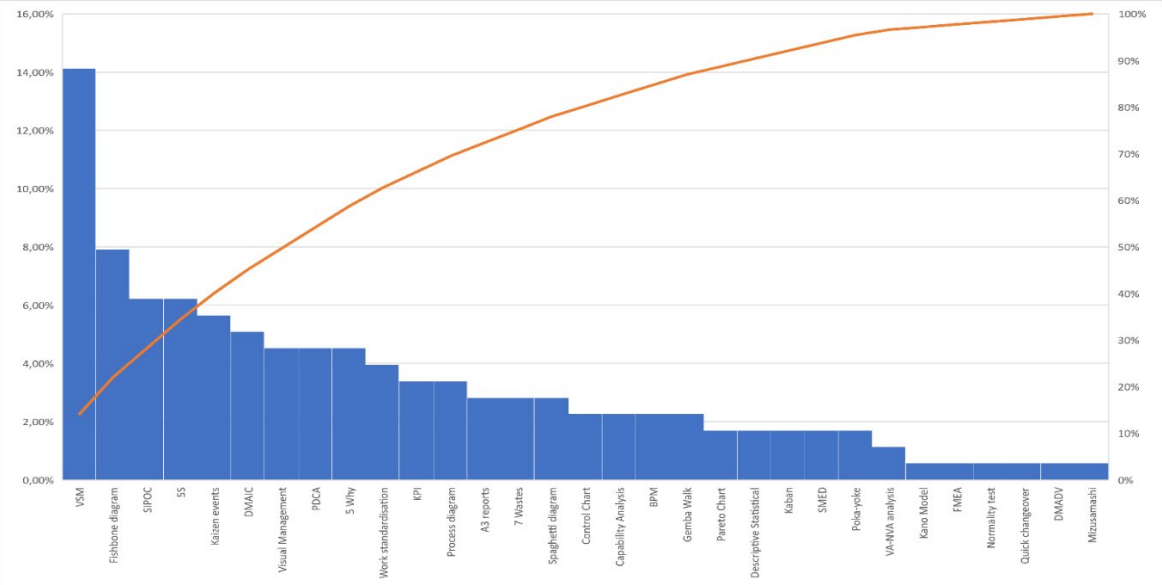

Figure 2. Lean tools and practices

3.4 Gains from Lean healthcare implementation

After investigating barriers and facilitators to implementing Lean and pointing out leading Lean practices, the following paragraphs gather the most gains healthcare organizations achieved from Lean healthcare implementation. It considers positive results related to patients and collaborators (e.g. staff, healthcare professionals), the financial performance of an organization, and improvements in healthcare service delivery.

Firstly, Lean healthcare has helped healthcare institutions to create a patient-centric process (Zhu et al., 2014); for this reason, many studies identified an increase in the satisfaction of patients during the implementation process of this approach. Among the factors that promote positive impacts on the perception of service provided to patients are (1) an increase in the actual care time, which means no delays, and consequently, minimization of patient's and family's permanence in the hospital (Kane et al. 2015; Meacock et al. 2021), (2) less distance traveled between departments (Grassi et al. 2020), and (3) maintaining organized and less crowded rooms in that way to guarantee more comfort and confidence of care to patients (Zdęba-Mozoła et al. 2022;). Besides patient satisfaction, the reviewed articles brought improvements in collaborators' satisfaction (Improta et al. 2020; de Sousa et al. 2021) since Lean leads to creating a healthier, less stressful, and lower overload workplace (Barnabè et al., 2019; Santandreu et al. 2021). It also promotes collaboration and teamwork among collaborators (Drotz and Poksinska 2014; Ankrum et al. 2019) and empowers them to participate in the change process (Matos et al. 2016).

Regarding financial performance, not all documents reported organizations' saved amounts through Lean implementation. Still, there is significant evidence that cost improvements are relevant in implementing Lean (Costa et al. 2016). Among them, there are Farrokhi et al. (2015) recorded potential savings by decreasing the processing time; Régis et al. (2018) quoted a decrease in inventory in a Brazil hospital; Furterer (2018) illustrated an increase in the net margin by improving the hospital service and resulting in increasing the number of visits and inpatient admission at an emergency department; and last, Zdęba-Mozoła et al. (2022) cited savings in hiring professionals - 2.3 nursing positions and 1.09 medical staff positions – consequence of changes done in hospital's facilities.

Finally, positive results in healthcare processes are a recurrent theme. They also lead to the satisfaction of patients and staff and financial gains. Among the outcomes achieved by healthcare institutions include (1) balance of workload between professionals (Moreno-Fergusson et al. 2021), (2) optimization of room turnover to make units promptly available for the following medical procedure (Ankrum et al. 2019; Sales and De Castro 2021), (3) standardization of processes and procedures to eliminate causes of deviation (Sales and De Castro 2021; Barnabè et al. 2013), (4) elimination of non-value-added activities, and then increasing the efficiency of a care center (Peimbert-García et al.

2021), (5) reduction of medical and operational errors (Nino et al. 2020; Meacock et al. 2021) and (6) less usage of material (Farrokhi et al. 2015; de Sousa et al. 2021). The authors also presented that Lean practices strengthen healthcare organizations on resilience and flexibility of their operations, especially in contexts such as the Covid-19 pandemic (Morell-Santandreu et al. 2021; Kuiper et al. 2022).

4. Conclusion

To achieve the proposed research's goals, a narrative literature review was conducted following a systematic procedure to select the final sampling of articles. This article mainly purposed to identify the facilitators and barriers that could influence the implementation of Lean programs within institutions that deliver healthcare services; also, Lean tools and practices were raised from sampling articles and the benefits from their application. Firstly, it had been observed that papers mainly focused on discussing, in a straightforward way, those factors that may help the healthcare organizations in the Lean implementation process. Conversely, barriers that could hinder their process were not essentially pointed out. It may occur because Lean is applied in different organizational contexts (e.g. type, size, maturity), and each organization might face unique challenges.

Second, based on the content analysis of articles, most factors that impose barriers to Lean implementation in a healthcare organization are resistance to new habits, uncertainty, or lack of understanding of the benefits and well-defined organizational structure. Training workers in Lean concepts could solve this problem by involving them in small projects within an organization, in which they could implement the tools learned and share knowledge and experiences. On the other hand, team and leadership engagement, collaboration, and flexible organizational structure, which promotes multidisciplinary tasks, were cited as the most common enablers of Lean healthcare programs. Another relevant factor that works as both barrier and facilitator is the medical professionals – on one side, mainly physicians impose barriers to Lean changes since they could influence their medical practices. On the other hand, engaging these professionals through the Lean implementation process helps an organization achieve better operational results.

Last, to implement the Lean program within healthcare institutions, the literature suggests that the main tools are VSM, Fishbone Diagram, SIPOC, and 5S. In this way, when applying the Lean program, organizations can obtain positive results in the social sphere with their stakeholders, financial performance, and the value chain of the service offered. Most of the benefits achieved from applying these tools are related to increasing satisfaction of patients and collaborators, improvement in operational efficiency and financial performance, and resilience and flexibility of operations. Therefore, it confirms that overcoming barriers and enhancing Lean facilitators could support healthcare organizations to achieve higher operational and organizational outcomes.

Thus, this study contributes to academics and practitioners who want to implement the Lean program in healthcare institutions by providing a general understanding of the factors that can promote – or hinder – the implementation and explaining its techniques and benefits. However, as the study is a narrative literature review, it is noted that there is a limitation due to subjectivity related to the authors' filters and perspectives, which may interfere with the selection of the sample. In addition, during the evaluation of factors that could help or hinder the Lean implementation, it did not consider specificities of the healthcare institution in which the Lean program had been implemented, such as size and type of organization; it means they are evaluated as a whole. Then, appraising the facilitators and barriers considering the characteristics of healthcare institutions must be contemplated by future studies. Further, it is suggested to evaluate if the obstacles and the facilitators change in the time horizon according to the organization's maturity in quality management and Lean initiatives. That is, to verify if some factors are more relevant than others depending on the implementation time and maturity of Lean programs in health care institutions.

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Camila Melo is currently PhD student in Industry Engineering at the University of Sao Paulo. She received master degree in Industrial Engineering at Federal University of Pernambuco. Later, from 2016 until 2019, she worked in manufacturing and logistics fields. Her research interests mainly concern Quality Management in healthcare sector.

Fernando Berssaneti is currently a Professor of Industrial Operations and Industrial Management at the University of Sao Paulo and member of the Board of Trustees of the Carlos Alberto Vanzolini Foundation. He received a PhD in Production Engineering at the Polytechnic School of São Paulo (2011). He works as a business consultant and teaches courses in Specialization courses at Polytechnic School of São Paulo since 2004. Among his research interests there are Project and Product Management and Quality and Productivity Management.

Gabriel Rampini is currently PhD student in Industry Engineering at the University of Sao Paulo. He received master degree in Industrial Engineering at University of Sao Paulo. He works as risk and internal controls manager at military service. His research interests are risk management, compliance and auditing.

Izabelle Martinez is currently Master Student Industry Engineering at the University of Sao Paulo. She works as an analyst in a technology consulting company. Her main research interests are knowledge management and quality management.