



FACTORS AFFECTING THE SUPPLY CHAIN OF MEDICAL CONSUMABLES

Intan Sekar Arumdani¹, Muhammad Fadli Ramadhansyah,² Florianus Hans Matheus Mawo³, Erlangga Mandala Sakti⁴

^{1,3,4}Safin Pati University

²University of National Development “Veteran” Jakarta

Email: intansekar28@gmail.com

Abstract

Hospital is a crucial component of the current healthcare system and is in charge of supplying, preserving, and advancing community members' health using various resource. Networks are used to organize the numerous, complex health systems of today. Because of the partners' inconsistent behavior and lack of coordination, these networks are frequently underutilized. Each facility or even by industry or service, optimizes care quality and controls costs locally. A systematic global approach could enhance the general under optimization that emerges from this local concentration. The competition in the current global economy is between supply networks rather than enterprises. The comparison of supply chain performance indicators may last a very long time. This research uses a narrative review approach. There are a total of 23 papers used from databases from Science Direct, ProQuest, Scopus, SpringerLink, Hindawi, Google Scholar, JSTOR, and Emerald Insight. A supply chain's of medical consumables success is influenced by many internal and external factors such as exchange of information, enduring relationships, collaboration, and process integration. Agility becomes increasingly crucial to maintaining cooperation and teamwork, improving patients' experiences every time. Various elements influence the supply chain for medical consumables. Therefore, it is crucial to identify and evaluate the key variables influencing the healthcare supply chain for the medical consumables process and examine the strategies included in this review.

Keywords: Health Logistics; Supply Chain; Medical Consumables Supply Chain

INTRODUCTION

The primary objectives of the healthcare system are to preserve and advance public health, and hospitals, as essential healthcare institutions, play a significant role in delivering health services. The provision of high-quality, timely, and cost effective healthcare does not appear to be keeping up with the increase in demand. The condition, maintenance, and promotion of community members health is the responsibility of hospitals, an essential component of the modern healthcare system, using various resources. In order to perform this essential part, it is required to effectively respond to their expectations. Hospital services supply chain problems are the primary factor. This supply chain uses resources like capital, equipment, and information to improve therapeutic outcomes and keep costs under control. The supply chain for hospital services receives a large amount of the money spent on healthcare in hospitals (Mohagheghnejad, Ashkan Nasiripour, Zaboli, & Damghanian, 2020).



Many nations' healthcare systems face issues from aging populations, active patients, the rise of chronic diseases, financial and regulatory reforms, and the quick pace of technological advancements. The most likely source of solutions to these problems will not be one particular network actor but rather the collaboration of many. The productivity of a country can be significantly determined by looking at its healthcare system. People in good bodily and spiritual health can increase the country's production (Soewarno & Tjahjadi, 2018).

Despite the fact that it is widely acknowledged that cooperation is essential, coordinating the healthcare supply network is a challenging endeavor since it requires some network actors to align their diverse agendas in a single shared direction. A multidisciplinary team of various healthcare professionals may be needed for diagnosing and treating a rare disease, for instance, in addition to several laboratory tests, medications, medical equipment, and supplies from various industries, like the pharmaceutical and medical device sectors (Marques, Martins, & Araújo, 2020).

To ensure continuity of care, patients must be able to move around freely within the healthcare system. The movement and procurement of goods and services from the provider to the end user in order to enhance clinical outcomes while limiting costs is the definition of the healthcare supply chain. Considering how specialized health services are, patient flow and physical goods are included in the supply chain (drugs, pharmaceuticals, medical equipment, health aids, etc.). The healthcare supply chain lacks ways for coordinating between physicians, hospitals, and patients, is decentralized, and is subject to regulatory pressure. The stability of the supply chain through which the transfer of patients, medical professionals, information, and material goods occurs is crucial to the continuity of healthcare in the realm of planned medical treatments and life-saving circumstances (Skowron-Grabowska et al., 2022).

To address complicated issues in this situation, efficient supply chain medical consumables (SCMC) are crucial and create a Effective supply chain medical consumables (SCMC) is crucial in this situation to address complicated issues and foster a collaborative atmosphere that aids in cost savings and value addition across the whole supplier network. SCMS tools can enhance the flow of physical products and related healthcare services. This led to a significant amount of empirical research, which led to numerous literature reviews that sought to summarize, classify, and debate the state of academic inquiry at the time (Marques et al., 2020).

One of the variables influencing the growth of industry, tiny enterprises, is manpower (human resources) or labor productivity. The food processing industry struggles to grow and impacts labor productivity due to the low pay and education. Because of the poor level of education and learning awareness in the workforce, the bravery to adopt and use the technology developed in the country is still lacking. In addition, the role of technology is still not optimized. Due to the low education level and consequently still restrictive thinking, the industry can also not evolve in response to market demands and technological advancements due to a lack of experience in managing hospital supply (Ariani & Dwiyanto, 2013).



To thrive in the market and meet competition, threats, and market opportunities, the industry needs an effective strategy. To drive the goals to be accomplished in enhancing the company's performance, the industry must create and have a supply chain management plan. This will allow the company to survive in the competitive market. Information sharing, long-term partnerships, cooperation, and process integration are just a few of the variables that can impact how well supply chain management functions in a business (Mohagheghnejad et al., 2020).

The primary players in the healthcare supply chain are manufacturers (of pharmaceuticals, medical equipment, and hospital supplies), distributors, medical service providers, medical groups, insurance providers, governmental entities, employers, and recipients of health care services (Kanda & Iravo, 2015). Delivering supplies and information is the supply chain's ultimate purpose for patients to obtain high-quality medical care. An efficient supply chain gets the appropriate information and commodities to the right place at the right time in the correct quantities. Lowering risk and errors, doing away with operating room wait times and cancellations, and cutting down on the length of stay can directly and favorably affect patient care (Elmuti, Khoury, Omran, & Abou-Zaid, 2013).

High-quality and affordable health services cannot be provided without a strong supply chain. The results of earlier studies show that the health care supply chain is much more delayed than supply chains in other industries. According to a survey of numerous studies, Iran has few studies in the area of hospital care supply chain. In light of the significance of the hospital service supply chain, the goal of this study is to examine the variables influencing the supply chain (Mohagheghnejad et al., 2020). In this article, researchers will discuss associated factors that affect the supply chain of medical consumables, including the effects of information sharing, long-term relationships, cooperation, and process integration.

METHOD

The review methodology used in this study takes the form of a narrative review. A narrative review's objective is to identify the elements influencing the flow of medical supplies. There are no guidelines or criteria for gathering article narrative evaluations from scientific article sources, which are acquired from numerous databases (Huedo-Medina, Ballester, & Johnson, 2013). Articles used as reviews have inclusion criteria, such as: importance of hospital service supply chain, factors affecting the supply chain of medical consumables. Scopus, Science Direct, ProQuest, Hindawi, Google Scholar, Emerald, PLOS ONE, BMC Health Services Research, and PubMed were utilized in the literature search along with the following keywords "Factors affecting the supply chain of medical consumables" "Health logistics and health supply chain management"

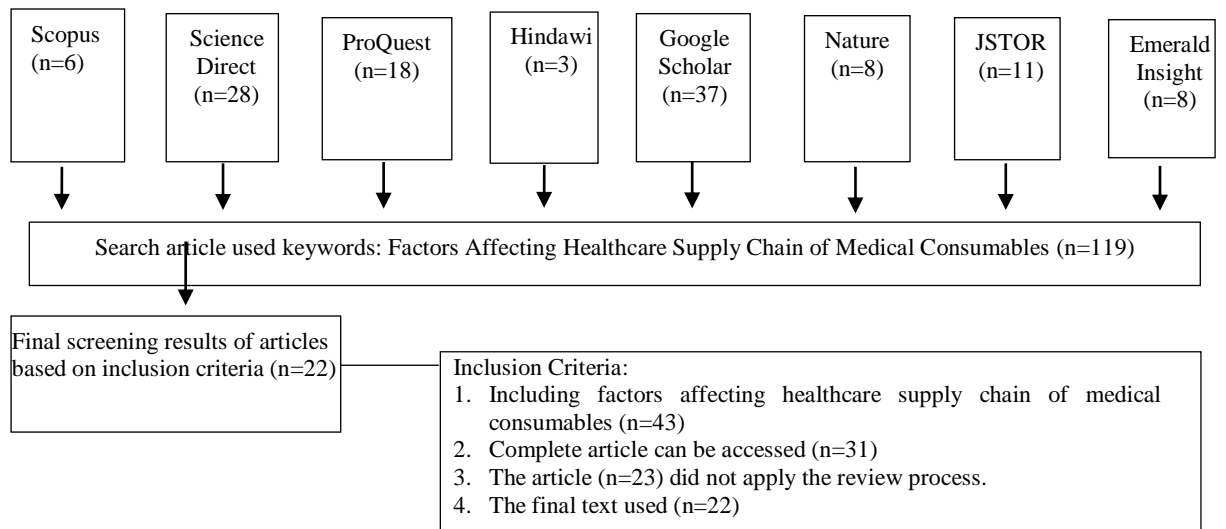


Figure 1 Flow Chart Screening Article

RESULT AND DISCUSSION

Based on synthesized articles. This article will focus on seven key concepts. The main ideas that will be discussed include: Healthcare Supply Chain Consumables, Healthcare Operation from a Supply Chain Management Perspective, Characteristic and Issue of Health Care Supply Chain Consumables, Association of Information Sharing with Supply Chain of Medical Consumables, Association of Long Term Relationship with Supply Chain of Medical Consumables, Association of Cooperation with Supply Chain of Medical Consumables, Association of Process Integration with Supply Chain of Medical Consumables.

Table 1. Result Synthesis Matrix

No	Main Idea	Similarities of Research Findings
1	Healthcare Supply Chain Consumables (HSCC)	HSCC is a subset of the supply chain in which pharmaceuticals are manufactured, transported, and consumed. Key components set healthcare supply chain consumables apart from other applications. The healthcare supply chain has many problems, including misalignment, high provider costs, and a reliance on third parties, distributors, and manufacturers. Additionally, it is indisputable that leaders in the healthcare industry
		are under tremendous political and public pressure to keep prices

		under control while raising the standard of treatment.
2	Healthcare Operation from a Supply Chain Management Perspective	The healthcare supply chain is essential because supplies that make up a small number of things are frequently very expensive (per unit), have a limited shelf life, and/or necessitate costly on-site storage facilities (e.g., injectable medical supplies, pharmaceutical supplies, and surgical supplies). The vast majority of other items, however, including as tubing, suture kits, latex examination gloves, and plastic/disposable sheeting, are regarded as non-critical. The huge quantity of non-essential supplies often accounts for the remaining inventory investment for these networks, even if critical supplies make up the majority of the total investment (about 60%).
3	Characteristic and Issue of Health Care Supply Chain Consumables	The healthcare supply chain of medical consumables has unique characteristics and encounters various challenges than supply chains in other industries. Activities in the supply chain grow more complex as a result. The supply chain for the healthcare sector has a high cost and quality due to its universal complexity. It has been suggested that even modest increases in supply chain quality can have a sizable positive impact on long-term costs.
4	Association of Information Sharing with Health Care Supply Chain of Medical Consumables	Information sharing is a crucial step in the integration and openness of the supply chain of medical consumables. Information redundancy prevention is the primary goal of information sharing in the drug supply chain. Understanding the elements affecting information sharing is
No	Main Idea	Similarities of Research Findings
		vital to finding an effective

		strategy to overcome obstacles and improve integrated information flow in the drug supply chains.
5	Association of Long Term Relationship with Health Care Supply Chain of Medical Consumables	In the context of either products or relationships that are thought to offer long-term benefits to customers, the term "long-term relationship" refers to the perception of customers as being dependent on suppliers. To ensure that information processing between internal and external organizational units continues, long-term relationships necessitate supportive services for SCMC.
6	Association of Cooperation with Health Care Supply Chain of Medical Consumables	For businesses that heavily rely on the importation of modern technology and products, cooperation in the healthcare supply chain of medical consumables is essential. Cooperation between business, academia, healthcare facilities, and patients is advantageous for the efficient fusion of numerous resources and the development of a vast information network for medical innovation. Patients are consumers of medical goods and services in addition to being people who require a cure.
7	Association of Process Integration with Health Care Supply Chain of Medical Consumables	Integration in the supply chain demonstrates a complex process of cooperation between a firm and its suppliers and customers. In the supply chain, managing the customer connection is regarded as essential. Diverse research viewpoints were considered, and customer integration was developed.

Increasing information exchange, long-term relationships, cooperation, and process with healthcare supply chain of medical consumables is among the most effective methods for achieving excellence in healthcare supply chain of medical consumables, among other things. On the other side, healthcare supply chain of medical consumables is a primary objectives of the healthcare system are to preserve and advance public health, and hospitals, as essential healthcare institutions, play a significant role in delivering health services.

Structure, technique, and result are frequently used to gauge quality in the healthcare industry. All three of the components that are notably missing from the current models should always be included in quality improvement measurements. The hospital structure is assessed using the people and material resources available in each hospital (Nugraheni & Kirana, 2021).

1) Healthcare Supply Chain of Medical Consumables

A portion of the supply chain in which pharmaceuticals are produced, delivered, and consumed is called the healthcare supply chain consumables (HSCMC). To fulfill the need through a particular distribution channel, HSCMC starts with drug manufacturer suppliers and ends with the patient (basically the customer). Many researchers have proposed many SC models for various healthcare products, including drugs, vaccines, and other medical equipment. These models were developed because to the characteristics and patient requirements (KHodadadi et al., 2021; Kumar et al., 2009).

Additionally, it has been said that between 20 and 30 percent of all medical expenses worldwide are spent on drugs. The price of medicine in impoverished countries might increase by up to 650 percent over the appropriate international level due to the lack of accessible low-cost medications. The main causes of the dearth of reasonably priced, top-notch life-saving medications are a lack of money, ineffective forecasting, inadequate storage facilities, a dysfunctional delivery system, and theft of medications for personal resale (Dixit et al., 2019; Kumar et al., 2009).

The healthcare value chain is made up of five major players. Manufacturing companies, purchasers, vendors, product middlemen, and financial intermediates are among them. Numerous researchers looked at the expenses associated with HSCMC performance, and the literature proposes supply chain management as a method of reducing costs (Turhan & Vayvay, 2012). The value of giving performance indicators for ordering and inventory management, receiving, storage, and replenishment processes in the healthcare industry. For the healthcare supply chain to function, internal customer satisfaction is essential. They make the point that tools like internal customer satisfaction surveys can influence changes in how healthcare is delivered, which in turn enhances the efficiency of the entire supply chain (Ariani & Dwiyanto, 2013; Yanamandra, 2018; Yuniar, 2012).

An integrated model was developed based on these factors, and it includes five dimensions of supply chain consumables performance: flexibility, integration, responsiveness to the patient, physician performance, and partnership quality. The HSCC is a network of healthcare providers, including physicians, consultants, specialists, hospitals, clinics, pharmacies, and insurance companies (de Vries & Huijsman, 2011). The ultimate objective of this constellation is to contribute value through cooperation. Suppliers, patients, hospital personnel, strategic partners, and others coming together to collaborate, coordinate, and work as a team to provide consumer value in healthcare. Each care bundle in the healthcare supply chain is made up of materials that are contributed by suppliers, customers, hospital employees, strategic partners, and others, who use these resources to add value for the client. The supply chain's interorganizational ties between various business partners help to boost the development of customer value

(Dixit et al., 2019; Kumar et al., 2009; Yanamandra, 2018).

Healthcare supply chains are distinctive because they prioritize saving lives over financial gain. The establishments that interact with patients and create demand along the healthcare supply chain are known as healthcare providers (clinics or hospitals). Both public and private healthcare providers must be financially successful in order to maintain their operations and continue providing healthcare, and both types of providers must be profitable in order to make sure that taxpayer funds are used wisely. To manage risks and create supply chain resilience (SCRes), it is essential to define the main characteristics of the supply chain. Total productive maintenance (TPM) and total quality management (TQM) are two organizational frameworks that provide stability in the upstream healthcare supply chain. We identify factors that contribute to the overall resilience of the healthcare supply chain as being trust, cooperation, supply chain connectivity, supply chain visibility, and information exchange (Wieser, 2011).

The use of nearly 5,000 distinct types of medical equipment, including tongue depressors and pacemakers, poses a substantial management difficulty that SCRM could solve. Aside from the inherent difficulty of controlling medical equipment, present global population expansion and aging provide additional challenges. They significantly raise the need for healthcare spending and promote the hunt for cutting-edge management strategies capable of dealing with the resulting complex scenarios, such as SCRM. Thus, from several perspectives, an essential gap in the research regarding applying (Senna et al., 2021).

2) Health Care Operations from a Supply Chain Management Perspective

From a historical perspective, over the past forty years, the emphasis within industrial firms has slowly changed from a strong concentration on specific processes to a chain orientation. In order to remain competitive, manufacturing companies believed that management and control of particular processes was essential. Our comprehension and insight into the planning and control of factory operating processes have considerably benefited from the many mathematical models and tools that mainstream operations management research generated during this time (de Vries & Huijsman, 2011).

Without a doubt, the advancing capabilities of information and communication technology contributed to the late 1990s business focus shift. Manufacturing companies are placing a lot of emphasis on managing goods flows in a more integrated way, and using enterprise resource planning software has been a key factor in this. ERP systems are computer programs that integrate, standardize, and automate business processes throughout enterprises' value chains. A collection of modules connected by a central database, from which all modules draw, manipulate, and update data, are used to achieve this. ERP systems make clear and alluring claims that managers would be able to make better decisions, that communication costs will go down, and that firms will become more connected and unified (Rzońca et al., 2021; Świeżewski et al., 2019).

There have been many studies on integrated planning systems, which have followed changes in practice. Mainstream operations management research in

the 1980s and 1990s focused on the issue of how to prevent sub-optimization in the management of goods flows within businesses. During this time, a number of study topics are thoroughly studied, including coordination across several planning levels, the use of master production schedules, and the adoption of planning and control frameworks (Senna et al., 2021; Turhan & Vayvay, 2012).

The health care industry is partially taken into account by the adjustments described above. From an operations management perspective, process optimization was once the industry's main focus. Examples of well-known examples include the use of operations research techniques to maximize drug inventory levels and tactics for expediting the ordering procedure for pharmaceuticals and medical supplies. Given that it is commonly known that information and communication technology can considerably improve health supply chains, similar to advancements in the industrial sector, it should not be surprising that many health care organizations have started projects in this field (Polater & Demirdogen, 2018). According to recent studies, installing efficient supply networks can significantly lower the healthcare industry's expenses related to supply chains (Mandal, 2018). But there are some indications that the healthcare sector is lagging behind the rest of the sector in implementing supply chain management strategies (Martínez-Jurado & Moyano-Fuentes, 2014).

The movement of patients and tangible objects like drugs, pharmaceuticals, medical equipment, and health aids are affected by the application of supply chain management strategies in the healthcare sector. A developing area in operations and supply chain management is patient logistics, which comprises all planning and control decisions made to balance supply and demand along the healthcare supply chain. The complexity and diversity of patient demand are typically the focus of patient logistics in practice, but clearly, there are also major coordination issues amongst healthcare companies (Mandal, 2018). Like manufacturing firms, many optimization concerns in the healthcare industry center on balancing high resource utilization with high levels of customer service. Unsurprisingly, boosting performance through better-integrated health care supply chains is a hot topic in patient logistics. However, the topic of how this integration may be effectively done remains an area of supply chain management that is still largely unexplored and beginning from this question. Only a few academic studies address the difficulties specific to the health care environment.

3) Characteristic and Issues of Healthcare Supply Chain Medical Consumables

The healthcare supply chain for medical consumables differs from supply networks in other industries and has unique challenges. Some of these problems include a lack of provider-level consolidation, problems with regulatory bodies' policies, and a lack of coordination and collaboration between the upstream and downstream supply chain streams. The HCSMC's members behave in a more fragmented manner and attend to their fellow members' needs later. All HCSMC members behave in a way that prioritizes personal gain over supply chain gain. As a result, they start to pay less attention to the patient, who is the end-user. Because there is a lack of

communication, cooperation, and trust among HCSC members, the patient ultimately suffers by having to pay more for subpar services (Yanamandra, 2018)(Novita, Suliantoro, & Utami, 2016).

The introduction of new products and techniques for diagnosis and treatment is made possible by technological advancements in the healthcare industry, which leads to a quick buildup of obsolete inventory. The complexity has increased as a result of inadequate delivery and distribution procedures, forecasting, inventory management systems, and procurement.

Another significant difficulty with HCSMC is that there are multiple decision-makers involved in the purchasing process. External consultants and advisers, doctors, hospital owners (who do not always have to be medical experts), store managers, purchase and procurement managers, and others are all directly or indirectly involved in the purchasing process. Additionally, the products purchased are highly unique and diverse, ranging from minor items like disposal needles to large-scale equipment like CT scanners, MRI machines, X-ray machines, ICU equipment, artificial limbs, cardiac stents, pacemakers, and other similar items. Nearly all of these items are required and frequently utilized by hospitals (Martínez-Jurado & Moyano-Fuentes, 2014).

Activities in the supply chain grow more complex as a result. A significant cost and quality driver in the healthcare sector is the supply chain's universal complexity. It has been suggested that even modest increases in supply chain quality can produce considerable long-term cost savings (Akmal, Greatbanks, & Foote, 2020; Wieser, 2011).

Achieving supply chain system integration in hospitals and clinics, maximizing patient care services, improving product availability by reducing storage space, decreasing material handling time and cost for all medical staff (nurses, pharmacists, doctors), and minimizing non-liquid assets are all requirements for effective solutions to the supply chain management issues facing the health care industry (Ageron, Benzidia, & Bourlakis, 2018; Mohagheghnejad et al., 2020).

It was found that internal supply chain operations had a poorer connection to external supply chain activities in terms of supply chain integration. The function and importance of logistics in healthcare were examined in this study. The best logistical practices of some of the institutions were examined by the writers together with the supply chain operations of various hospitals in the United States, Canada, the United Kingdom, France, and Japan. To create better synergy between logistics and all other departments, they suggested that hospitals re-engineer their logistical operations. In order to achieve efficient supply chain integration, the logistics function should move away from its traditional role of focusing primarily on its activities and take on a more proactive role (Yanamandra, 2018).

There hasn't been much empirical research linking healthcare supply chain initiatives to overall organizational effectiveness or looking into their effects on stakeholders in the healthcare industry, despite their importance, theoretical development, and popularity in the business and academic press. In order to identify the current state of healthcare SCM, highlight current issues and opportunities for quality improvement in healthcare settings, more study is necessary (Elmuti et al., 2013).

4) Association of Information Sharing with Healthcare Supply Chain of Medical Consumables

The integration and openness of the supply chain for medical consumables depend heavily on information sharing. Possibilities for managers to make sound strategic decisions and take appropriate action when given credible information increases organizational visibility, which may facilitate the early detection of problems, hasten the order-to-delivery process, and strengthen social ties, particularly in the era of new social media. Productivity will increase directly and favorably as a result, and chain networks will become more expansive and quick to respond to new markets (Hassan & Nasereddin, 2018).

Information sharing is described as the corporation's willingness and ability to interact with partners to exchange information related to shared business strategies. Sharing information also makes it possible for supply chain participants to gather, preserve, and share the knowledge needed for sound decision-making. This increases overall collaboration, which helps to alleviate industrial bottlenecks. Information sharing can help businesses improve the efficiency and efficacy of their supply chains, and it is the most significant aspect in creating successful supply chain coordination and acting as the controller along the supply chain consumables (Ariani & Dwiyanto, 2013).

Information redundancy prevention is the primary goal of information sharing in the drug supply chain. What information is exchanged, how it is shared, when it is shared, where it is shared, and with whom all affect how well the supply chain performs. Understanding the elements affecting information sharing is vital to finding an effective strategy to overcome obstacles and improve integrated information flow in the drug supply chains. This will enable high-quality information sharing throughout the drug supply chains (Novita et al., 2016; Suliantoro, Dewi, & Handayani, 2016).

The factors influencing information exchange in the SCMC have been discussed in the literature. However, there hasn't been much research done on the effects of environmental uncertainty, internal organizational facilitators, and inter-organizational relationships on information sharing and information quality in the SCMC (Elmuti et al., 2013). Particularly, there hasn't been a strong emphasis placed on information exchange in the management of healthcare supply chains (Polater & Demirdogen, 2018). In Given this, the objective of this study was to simultaneously examine how supply chain information sharing and information quality are impacted by environmental uncertainty (the uncertainty of customers, suppliers, and IT), intra-organizational facilitators (top management support and IT enablers), and inter-organizational relationships (supply chain partner commitment, trust, and shared vision) (Nouranian, Saghaeiannejad Isfahani, & Memarzadeh, 2021)

5) Association of Long Term Relationship with Healthcare Supply Chain of Medical Consumables

In the context of either products or relationships that are thought to offer long-term benefits to customers, the term "long-term relationship" refers to

the perception of customers being dependent on suppliers. The contact between the company and its suppliers is the most effective collaboration in the value chain or supply chain environment. In this situation, the supplier's responsibility is to provide the company with the products or inputs it needs. The performance of the supplier, which in turn affects the company's overall success, determines the quality of the material and its capacity for distribution. The profit produced by robust, long-lasting, and mutually beneficial long-term partnerships is known as long-term relationship management (Ariani & Dwiyanto, 2013; Mandal, 2018).

Long-term partnerships demand supported services for SCMC in order to maintain the information processing between internal and external organizational units. For instance, search engines to find all sourcing-related data, inventory control systems to establish a crucial connection with product requesters and the logistics department, business process modeling and enterprise architecture tools to visualize, simulate, and analyze various structural aspects of the purchasing department, and personnel administration tools to manage workforce-related information, financial and controlling systems to define (Mettler & Rohner, 2010).

6) Association of Cooperation with Healthcare Supply Chain of Medical Consumables

For businesses that heavily rely on the importation of technology and cutting-edge goods, collaboration in the healthcare supply chain of medical consumables is essential. Alliances between corporations, academic institutions, and research organizations are essential for lowering research risk and hastening the discovery of ground-breaking medical innovations. As a result, it is possible to accelerate the creation of appropriate medical goods and services. Collaboration between business, academics, hospitals, and patients is beneficial for the effective integration of various resources, the formation of a wide knowledge network for medical innovation, and the construction of open innovation platforms (Bhaskar et al., 2020).

Patients are not only persons who need to be treated; they are also consumers of medical products and services. As the main consumers of such goods and services, patients play a significant role in long-term medical innovation and drive the market's main trend. Users provide companies with new views that enable them to better understand the requirements and expectations of their customers, save costs, enhance product design and safety, and identify potential problems with medical products as they are being produced. Users also offer in-the-moment feedback after new products are introduced to the market. To be successful, however, firms must adopt the right methods and timing when integrating customers in the creation of products (Chen, Hou, & Wang, 2020).

When many parties collaborate to accomplish goals that benefit both parties, the situation is said to be a cooperative relationship. A desire to build relationships that inspire dedication and trust is necessary for practical cooperation. In order to improve the company's revenue and achieve strong performance through collaboration, there must be a healthy relationship between the two parties. This can only be achieved through the existence of cooperation with dependable suppliers (Ariani & Dwiyanto, 2013).



There are no procedures by which crucial information about the funding, supply, and distribution of pharmaceuticals may be easily obtained in emerging nations with ongoing medical consumables shortages (Nurhadi, 2020). Furthermore, data on demand and usage are either absent or suspect. A deliberate effort must be made to improve communication between the sectors to improve access to such important information. In hospitals in wealthy and emerging nations, there is frequently little to no interaction between those who are prescribing and those who are ordering the prescriptions. Additionally, this can result in an excess or shortage of medical supplies. Patients cannot access essential medications due to a lack of supply, and doctors are unable to assist their patients (Govindan, Mina, & Alavi, 2020).

Additionally, problematic is having too many prescriptions on hand because they expire. Such results may result from inadequate incentives and poor information flow. Health organizations must be aware of the availability of medicines and medical supplies. Therefore, precise and efficient cooperation is required to ensure that the demand for medications and supplies needed for hospitals' crucial functioning is projected as correctly as feasible (Turhan & Vayvay, 2012).

7) Association of Process Integration with Healthcare Supply Chain of Medical Consumables

Integration, which is the joining of parts or activities to create a whole, can strengthen relationships along each value chain, make decision-making easier, enable value creation, and enable transfer processes from suppliers to final customers to manage the flow of data, knowledge, equipment, and assets. Integration in the supply chain demonstrates a complex process of cooperation between a firm and its suppliers and customers. This process can increase operational efficiency, boost a company's earnings, and satisfy all parties if managed effectively. To compete in the business world, the company's supply chain integration pattern reflects its operational focus.

Supply chain integration is described as "the Alliances between businesses, academic institutions, and research coordination of supply chain processes through the smooth flow of information up and down the supply chain." Supply chain integration is the process by which all participants in the supply chain—suppliers, businesses, and clients—work together and independently to achieve common objectives, such as increasing customer value and lowering overall costs.

Other research made reference to a connection between operational success and upstream and downstream interactions. Other research, however, continued to support the inescapable link between supplier, internal, and customer integration and overall organizational effectiveness. According to several studies, there is a significant link between organizational performance and supplier and customer integration.

In the supply chain, managing the customer connection is regarded as essential. Diverse research viewpoints were considered, and customer integration was developed. This customer integration calls for crucial skills from collaboration with important clients. The supply chain integration was examined from various angles, including attitudes, patterns, and behaviors.



Internal and external supply chain integration is seen from a bigger picture perspective. External integration includes both customer integration and supplier integration.

CONCLUSION

Various elements influence the supply chain for medical consumables. Additionally, there are several problems because supply chain operations are intricate and significantly impact the hospital's development. Therefore, it is crucial to identify and evaluate the key variables influencing the healthcare supply chain for the medical consumables process and examine the strategies included in this review. Managing the customer relationship is viewed as being crucial in the supply chain. When designing customer integration, we considered numerous research angles. To ensure that all planning and control choices are made to balance supply and demand throughout the healthcare supply chain.

REFERENCES

- Ageron, B., Benzidia, S., & Bourlakis, M. (2018). Healthcare logistics and supply chain – Issues and future challenges. *Supply Chain Forum*, 19(1), 1–3. <https://doi.org/10.1080/16258312.2018.1433353>
- Akmal, A., Greatbanks, R., & Foote, J. (2020). Lean thinking in healthcare – Findings from a systematic literature network and bibliometric analysis. *Health Policy*, 124(6), 615–627. <https://doi.org/10.1016/j.healthpol.2020.04.008>
- Ariani, D., & Dwiyanto, B. M. (2013). ANALISIS PENGARUH SUPPLY CHAIN MANAGEMENT TERHADAP KINERJA PERUSAHAAN (Studi Pada Industri Kecil dan Menengah Makanan Olahan Khas Padang Sumatera Barat). *Diponegoro Journal of Management*, 2, No 3, 1–10. Retrieved from <http://ejournal-s1.undip.ac.id/index.php/djom>
- Bhaskar, S., Tan, J., Bogers, M. L. A. M., Minssen, T., Badaruddin, H., Israeli-Korn, S., & Chesbrough, H. (2020). At the Epicenter of COVID-19—the Tragic Failure of the Global Supply Chain for Medical Supplies. *Frontiers in Public Health*, 8(November), 1–9. <https://doi.org/10.3389/fpubh.2020.562882>
- Chen, R., Hou, G. S., & Wang, Y. (2020). Cooperative Innovation in the Medical Supply Chain Based on User Feedback. *Complexity*, 2020. <https://doi.org/10.1155/2020/7106917>
- de Vries, J., & Huijsman, R. (2011). Supply chain management in health services: An overview. *Supply Chain Management: An International Journal*, 16(3), 159–165. <https://doi.org/10.1108/13598541111127146>
- Dixit, A., Routroy, S., & Dubey, S. K. (2019). A systematic literature review of healthcare supply chain and implications of future research. *International Journal of Pharmaceutical and Healthcare Marketing*, 13(4), 405–435. <https://doi.org/10.1108/IJPHM-05-2018-0028>
- Elmuti, D., Khoury, G., Omran, O., & Abou-Zaid, A. S. (2013). Challenges and Opportunities of Health Care Supply Chain Management in the United States. *Health Marketing Quarterly*, 30(2), 128–143. <https://doi.org/10.1080/07359683.2013.787885>
- Govindan, K., Mina, H., & Alavi, B. (2020). A decision support system for



- demand management in healthcare supply chains considering the epidemic outbreaks: A case study of coronavirus disease 2019 (COVID-19). *Transportation Research Part E: Logistics and Transportation Review*, 138(May), 101967. <https://doi.org/10.1016/j.tre.2020.101967>
- Hassan, A. Y., & Nasereddin, H. H. O. (2018). *Importance of Information Sharing in Supply Chain and Knowledge Leakage*. (October).
- Huedo-Medina, T. B., Ballester, E., & Johnson, B. T. (2013). Research Syntheses Related to Childhood and Adolescent Sexuality: A Critical Review. *Handbook of Child and Adolescent Sexuality*, 41–95. <https://doi.org/10.1016/B978-0-12-387759-8.00003-9>
- Kanda, M. K., & Iravo, M. A. (2015). Access Factors Affecting Supply Chain Efficiency of Medical Supplies in public Health Centers in Kenya: A Case Study of Public Health Centers in Elgeyo Marakwet Count. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 5(2), 32–41. <https://doi.org/10.6007/ijarafms/v5-i2/1560>
- KHodadadi, V., Bakrani, A., & Vafaie, M. H. (2021). Factors Affecting Medical Equipment Management in the COVID-19 Pandemic Crisis: A Mixed Qualitative and Quantitative Study. *Hospital Practices and Research*, 6(1), 23–28. <https://doi.org/10.34172/hpr.2021.05>
- Kumar, S., Swanson, E., & Tran, T. (2009). RFID in the healthcare supply chain: Usage and application. *International Journal of Health Care Quality Assurance*, 22(1), 67–81. <https://doi.org/10.1108/09526860910927961>
- Mandal, S. (2018). Influence of human capital on healthcare agility and healthcare supply chain performance. *Journal of Business and Industrial Marketing*, 33(7), 1012–1026. <https://doi.org/10.1108/JBIM-06-2017-0141>
- Marques, L., Martins, M., & Araújo, C. (2020). The healthcare supply network: current state of the literature and research opportunities. *Production Planning and Control*, 31(7), 590–609. <https://doi.org/10.1080/09537287.2019.1663451>
- Martínez-Jurado, P. J., & Moyano-Fuentes, J. (2014). Lean management, supply chain management and sustainability: A literature review. *Journal of Cleaner Production*, 85, 134–150. <https://doi.org/10.1016/j.jclepro.2013.09.042>
- Mettler, T., & Rohner, P. (2010). *Supplier Relationship Management in Health Care*. (April 2014), 206–229. <https://doi.org/10.4018/978-1-61520-603-2.ch012>
- Mohagheghnejad, M., Ashkan Nasiripour, A., Zaboli, R., & Damghanian, H. (2020). *Model of Factors Affecting Hospital Services Supply Chain Hospital Services Supply Chain*. 28(6), 959–969. Retrieved from http://jsums.medsab.ac.ir/article_1358_317e55ec2171adfa31ed36d60255289c.pdf?lang=en
- Nouranian, M., Saghaeiannejad Isfahani, S., & Memarzadeh, H. (2021). Information sharing and information quality in the drugs and medical consumables supply Chain management (SCM). *Iranian Journal of Pharmaceutical Sciences*, 17(1), 27–42.
- Novita, I., Suliantoro, H., & Utami, N. (2016). Analisis Rantai Pasok Pengadaan Bahan Medis Habis Pakai (Studi Kasus: RS Puri Asih Salatiga). *Industrial Engineering* Retrieved from <https://ejournal3.undip.ac.id/index.php/ieoj/article/view/11908>



- Nugraheni, R., & Kirana, G. R. (2021). SWOT Analysis of Hospital Health Services in DKT TK IV Hospital Kediri 2019. *Jurnal Ilmiah Kesehatan*, 10(1), 756–764. <https://doi.org/10.30994/sjik.v10i1.550>
- Nurhadi, A. (2020). Effect of Service Quality on Patient Satisfaction at Graha Juanda Hospital in Bekasi. *Jurnal Office*, 6(1), 1. <https://doi.org/10.26858/jo.v6i1.14723>
- Polater, A., & Demirdogen, O. (2018). An investigation of healthcare supply chain management and patient responsiveness: An application on public hospitals. *International Journal of Pharmaceutical and Healthcare Marketing*, 12(3), 325–347. <https://doi.org/10.1108/IJPHM-07-2017-0040>
- Rzońca, E., Bień, A., Bączek, G., Rzońca, P., Filip, M., & Gałązkowski, R. (2021). Suspected miscarriage in the experience of emergency medical services teams—preliminary study. *International Journal of Environmental Research and Public Health*, Vol. 18. <https://doi.org/10.3390/ijerph182312305>
- Senna, P., Reis, A., Santos, I. L., Dias, A. C., & Coelho, O. (2021). A systematic literature review on supply chain risk management: is healthcare management a forsaken research field? *Benchmarking*, 28(3), 926–956. <https://doi.org/10.1108/BIJ-05-2020-0266>
- Skowron-Grabowska, B., Wincewicz-Bosy, M., Dymyt, M., Sadowski, A., Dymyt, T., & Wasowska, K. (2022). Healthcare Supply Chain Reliability: The Case of Medical Air Transport. *International Journal of Environmental Research and Public Health*, 19(4336).
- Soewarno, N., & Tjahjadi, B. (2018). Factors Affecting Healthcare Costs in Indonesia: What the Hospitals and Doctors Said. *Journal of Contemporary Accounting and Economics Symposium*.
- Suliantoro, H., Dewi, I. N., & Handayani, N. U. (2016). *Supply chain analysis of disposable medical devices*. (2004), 193–198.
- Świeżewski, S. P., Rzońca, P., Panczyk, M., Leszczyński, P. K., Gujski, M., Michalak, G., ... Gałązkowski, R. (2019). Polish Helicopter Emergency Medical Service (HEMS) response to stroke: A five-year retrospective study. *Medical Science Monitor*, 25, 6547–6553. <https://doi.org/10.12659/MSM.915759>
- Turhan, S. N., & Vayvay, O. (2012). A Non Traditional Vendor Managed Inventory: A Service Oriented based Supply Chain Modeling in Health Services. *International Conference on Industrial Engineering and Operations Management*, 1526–1535. Retrieved from <http://ieomsociety.org/ieom2012/pdfs/366.pdf>
- Wieser, P. (2011). From Health Logistics to Health Supply Chain Management. *Supply Chain Forum: An International Journal*, 12(1), 4–13. <https://doi.org/10.1080/16258312.2011.11517249>
- Yanamandra, R. (2018). Development of an integrated healthcare supply chain model. *Supply Chain Forum*, 19(2), 111–121. <https://doi.org/10.1080/16258312.2018.1475823>
- Yuniar, A. R. (2012). *Manajemen Rantai Pasok*.