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REVIEW: MEDICAL CONSUMABLE LOGISTIC MANAGEMENT PROCESS IN HOSPITALS

Rachel Karimah[1*], Chriswardani Suryawati[2], Septo Pawelas Arso[2]
[1]*Department of Master Public Health, Faculty of Public Health, Diponogoro University*
Jl. Prof. Soedarto 1269, Tembalang-Semarang, Central Java 50275
[2]*Department of Health Policy and Administration, Faculty of Public Health, Diponogoro University*
Jl. Prof. Soedarto 1269, Tembalang-Semarang, Central Java 50275
**Email Corresponding: rachellkarimah27@gmail.com*

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ABSTRACT

Medical consumable supply management is done in a continuous cycle, or a logistics cycle, in accordance with the goals of logistics management. The planning, budgeting, purchasing, storing, distributing, withdrawing, destroying, and controlling of the requirements come first. Logistics management strongly emphasize inventory and material movement from the point of origin to consumption to satisfy the demands of consumers and users. In other words, the logistics system aims to provide the most excellent service while minimizing costs. Inventory is a vital component of every organization such as hospital. This study aims to understand the management procedure in the hospital installation's logistics unit. The study used a narrative review methodology. The publications compiled for this study were found using the keywords "Logistics Management," "Hospital Logistics Management," "Medical Consumables," and "Logistics Management" in Scopus, Science Direct, ProQuest, SpringerLink, Google Scholar, and Emerald Insight. Consumable healthcare supplies the amount of the materials used was 11 articles. The findings demonstrate the significance of each element to the operation of logistics management. The study's findings indicate that the logistics management process for managing medical consumables has an impact and can serve as a model for the distribution management system for managing medical supplies based on supply chain management evaluations.

***Keywords**: Logistic Management, Hospital Logistic , Medical Consumable*

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.(Yasrizal & Darmawan, 2022) 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. It is necessary to appropriately address their demands in order to carry out this significant function. The main cause issues with the supply chain for hospital services.(Mathur et al., 2018) This supply chain uses resources like capital, equipment, and information to improve therapeutic outcomes and keep costs under control. The logistic management for hospital services receives a large amount of the money spent on healthcare in hospitals.(Mohagheghnejad et al., 2020)

Every action taken to maintain and improve health to achieve the highest levels of health for the community is referred to as a health endeavor. The hospital is a vital healthcare center providing comprehensive, integrated, long-lasting health promotion, prevention, treatment,

and rehabilitation services. Medical Supplies One of the crucial tasks in hospitals and other health care facilities is logistics management analysis.(Noorhidayah et al., 2022)

All pharmaceutical service activities in hospitals are organized by the functional implementing unit known as the hospital pharmacy installation.(Beldek et al., 2020) Hospital pharmacy services, which include clinical pharmacy services, are an essential component of the hospital health care system, which is focused on patient care and offers high-quality and reasonably priced pharmaceutical preparations, medical equipment, and consumables for people at all socioeconomic levels. There is no entity in charge of managing pharmaceutical preparations, medical devices, or medical consumables in the hospital other than the Pharmacy Installation because all of these items are in circulation and under the control of the Pharmacy Installation.(Marques et al., 2020)

According to the Directorate of Pharmaceutical and Medical Devices Development, the Pharmacy Installation's logistics management system includes planning, budgeting, procurement, storage, distribution, maintenance, elimination, and control phases. Because these phases are interrelated, they must be carefully coordinated for each to operate as intended. The supply system and use of current pharmaceuticals will be ineffective due to the separation between stages.(Prasertyo et al., 2021)

Planning to evaluation are the first two steps in the activities cycle that makeup logistics management. These processes include preparing for requirements, budgeting for purchases, distribution, upkeep, elimination, and management. Pharmaceutical supplies are one of the logistics items that the hospital manages. Drugs and medical supplies are included in this medical consumables logistic management.(Liu et al., 2016)

The effectiveness of managing the logistics of medical consumables will ensure the safety/efficacy, utility, and quality of pharmaceutical preparations and medical devices and boost the accessibility, equity, and affordability of pharmaceuticals and medical devices. The effectiveness of this system aims to safeguard the public from risks brought on by improper or inappropriate use of medical devices and pharmaceutical preparations, as well as those that fall short of the standards for safety and utilization followed from the production process to use in the community.

Optimizing drug use, which involves planning to establish drug availability, safety, and effective use, is the most crucial component of pharmacy services. As a result, hospital revenues will probably decline if the issue of pharmaceutical supplies is not handled carefully and responsibly.(Ejeta et al., 2021; Soewarno & Tjahjadi, 2018)

Manufacturers (drugs, medical equipment, and hospital medical supplies), distributors, medical service providers, medical groups, insurance companies, government agencies, employers, government regulators, and consumers of health care services are the main participants in medical consumables logistic management.(Kanda & Iravo, 2015) Delivering supplies and information is the logistic management ultimate purpose for patients to obtain high quality medical care. An efficient logistic management 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 et al., 2013)

Without an efficient medical consumables logistic management, it is not possible to provide high quality and low cost health services. According to the previous studies findings, compared to industries, the health care logistic management is significantly delayed. By reviewing various researches, there are limited studies in the field of hospital service supply chain in Iran. Therefore, considering the importance of hospital service supply chain, the purpose of this study is to investigate the factors affecting hospital service.(Mohagheghnejad et al., 2020)

The researcher will explain the related factors that affect the logistics management of medical consumables in this article, the stages in carrying out logistics management, and the benefits of implementing the logistics management of medical consumables.

RESEARCH METHOD

This research uses a review approach in the form of a narrative review. The purpose of a narrative review is to determine factors affecting the supply chain of medical consumables. Scientific article sources are gathered from many databases, and there are no standards or norms in collecting article narrative reviews.(Huedo-Medina et al., 2013) Articles used as reviews have inclusion criteria, such as: importance of hospital service supply chain, factors affecting the supply chain of medical consumables. The literature search used the platforms Scopus, Science Direct, ProQuest, Hindawi, Google Scholar, MDPI, PLOS ONE, BMC Health Services Research, and PubMed with the keywords "*Logistic Management", "Hospital Logistic Management", "Medical Consumables", "Medical Consumables Logistic Management"*.

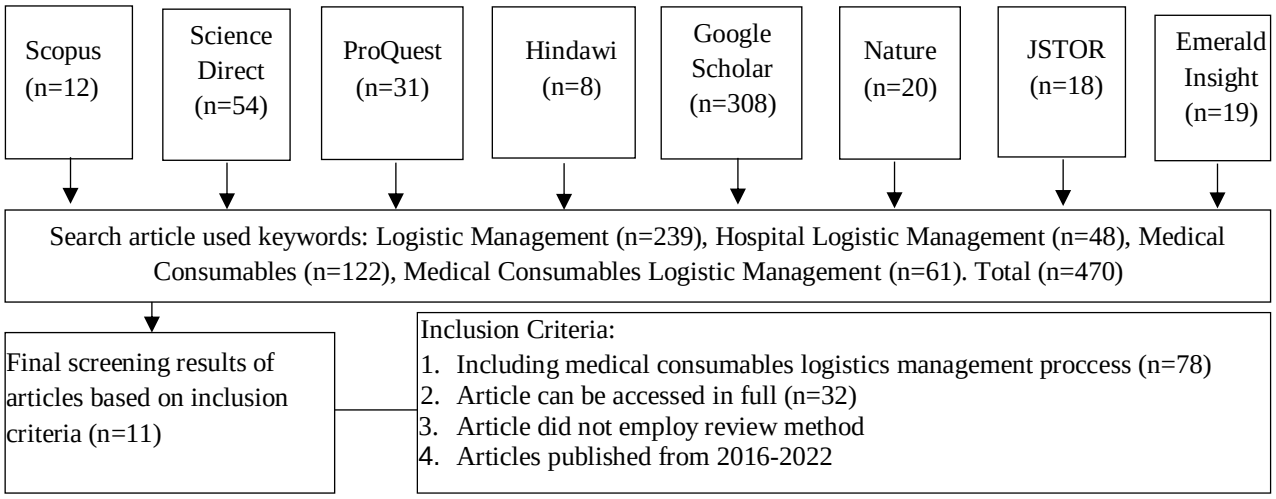

Figure 1. Flow Chart Screening Article

RESULTS AND DISCUSSION

Based on synthesized articles, there are 11 articles, 9 articels got from Google Scholar, 1 articles got from emerals insight, and 1 from ProQuest. There are 12 main ideas that will be discussed in this article. The main ideas that will be discussed include: planning, budgeting, procurement, receipt, storage, maintenance, distribution, control, deletion, recording, reporting, and monitoring evaluation.

Journal Identification and Synthesis

Table I. Research Article Extract Results

Authors, Title, Journal Identity, Year	Design / Method	Findings	Article Link
Desy Natalia Siahaan*, Nahdhia Fallah Putri Hamzah. Analisis Pengelolaan Manajemen Logistik di Depo Farmasi Pusat Jantung	Research with qualitative and quantitative methods	- The H.Adam Malik Hospital's logistics management is rated as good, with a fulfillment rate of 100% for medical supplies, equipment, and medicine services. - Planning, budgeting, procurement, receiving, storage, distribution, control, and elimination are all parts of logistics management at RSUP H.Adam Malik.	https://www.jurnalstikna.com/index.php/js/article/view/12

Authors, Title, Journal Identity, Year	Design / Method	Findings	Article Link
Terpadu RSUP. Adam Malik. Jurnal STINKA. 2017.		- There is currently no specific technique for the H. Adam Malik Hospital's control function.sus	
Slamet Widodo*, Amal Chalik Sjaaf. Gambaran Manajemen Logistik Kefarmasian pada Masa Pandemi COVID-19 di Rumah Sakit Umum Bhakti Asih Brebes Jawa Tengah. Jurnal Medika Hutama. 2022.	Research with quantitative method	- The implementation of pharmaceutical logistics management during the Covid-19 pandemic went well and was guided by the Minister of Health Regulation Number 72 of 2016 concerning Pharmaceutical Service Standards in Hospital, though there are still some infrastructure and facility requirements that must be met.	https://jurnalmedikahutama.com/index.php/JMH/article/download/411/281
Ayu Laili Rahmiyati, Syahidillah Anwar, Gunawan Irianto, Asep Dian Abdillah. Sistem Manajemen Logistik di Instalasi Farmasi Puskesmas Ciparay. Jurnal Kesehatan Kartika. 2022.	Research with qualitative method	- Make medication requests based on the drug planning strategy. - Manually entering data into the Puskesmas Management Information System to record and report drug organization and storage using the FIFO and FEFO systems.	http://ejournal.stikesjayc.id/index.php/litkartika/article/download/217/182
Gracewati Rambu Ladu Day, Muntasir Basri, Rina Waty Sirait. Manajemen Logistik Obat di Instalasi Farmasi RSUD Waibakul Kabupaten Sumba Tengah. Media	Research with qualitative method	- Although the Waibakul Hospital Pharmacy Installation managed medication logistics under Permenkes No. 72 of 2016's Pharmaceutical Service Standards in Hospitals, it was inefficient due to roadblocks at each management level. - A lack of funds, frequent doctor changes, and inefficient consumption practices hampered planning. The money for the purchase was still short, the procurement staff was not hospital-affiliated, and there was a problem with	DOI: 10.35508/mkm.v2i3.3014

Authors, Title, Journal Identity, Year	Design / Method	Findings	Article Link
Kesehatan Masyarakat. 2020.		the internet networks at Waibakul Regional Hospital. - Lack of infrastructure supporting drug storage, such as cabinets, refrigerators, air conditioning, pallets, trolleys, and printers, as well as delays in admissions and drug arrival times outside office hours.	
Wita Oileri Tikirik, Nini Sahrianti, Adilah Rezky Pratiwi, Afdalia Yuli Utari, Aprilia Ahmad, Arfiana Anas, Arif Fajriansyah, Syahira Aco, Asmawati, Aura Rabiulandari Basir, Faudiyah, Febriyanti, Hasliani, Sri Astuti Angraini, David. Gambaran Pengelolaan Manajemen Logistik Obat dan Alkes di Instalasi Farmasi Kabupaten Mamuju Tengah. Jurnal Promotif Preventif. 2022.	Research with qualitative method	- Drug orders are made based on a direct appointment system according to the needs of the Regency Pharmacy Installation - Medicines and Medical Consumables submitted by matching the invoice with the physical number of goods that arrived, checking the expiration date and batch number of the goods according to the invoice, checking the condition of the goods, matching the invoice with the order letter, and signing the minutes of the handover of the goods - How to separate drugs based on source and type, room/room temperature, and storage model using the First in First Out, First Expire First Out system and in alphabetical order.	**DOI:** https://doi.org/10.47650/jpp.v5i1.506
Dewi Herdina Puspasari, Yulian Wahyu Permadi, Wirasti. Evaluasi Manajemen Logistik Obat	Research with qualitative method	- The management of logistics management looks appropriate, but in the storage process there is still a lack of facilities and infrastructure that are not yet adequate in its implementation.	**DOI:** https://doi.org/10.54687/jurnalkajenv5i02.5

Authors, Title, Journal Identity, Year	Design / Method	Findings	Article Link
di Instalasi Farmasi Rumah Sakit Berdasarkan Petunjuk Teknis Standar Pelayanan Kefarmasian di Rumah Sakit Tahun 2019. Kajen. 2021.			
Muhammad Alfarizi. Determinant Factors of Hospital Service Quality and Patient Satisfaction: Hospital Logistics Management Approach. Asian Management and Business Review 2022	Research with quantitative method	- Given the importance of improving hospital logistics performance and the five constructs' contributions to more excellent service standards and patient happiness, this study's robust findings for each of the provided hypotheses imply this.	https://doi.org/10.20885/AMBR.vol2.iss2.art2
Noorhidayah, Husnul Khatimatun Inayah, Annisa Sintya Rahayu. Analysis of Drug Logistic Management at Puskesmas Landasan Ulin in 2021. An-Nadaa: Jurnal Kesehatan Masyarakat. 2022.	Research with qualitative method	- The study's findings indicate that while enough people work in pharmacy facilities, not all have had training in managing medication logistics, and the infrastructure and facilities are still insufficient. Since no activities have been scheduled, the process component for destruction and withdrawal has not appropriately gone. Due to the failure to provide the necessary drugs, the monitoring and assessment process for unscheduled activities has also not gone smoothly.	https://ojs.uniska-bjm.ac.id/index.php/ANN/article/view/7058/3987
Monika Arora, Yogita Gigras. Importance of Supply Chain Management in Healthcare of Third World Countries. International	Research with qualitative method	- The research paper's importance lies in its analysis of potential gaps in healthcare and its recommendations for practical measures that might be used to improve healthcare. - The Supply Chain guarantees that hospital departments, operations, and the revenue cycle are correctly linked.	**DOI** : 10.22034/2018.1.7

Authors, Title, Journal Identity, Year	Design / Method	Findings	Article Link
Journal of Supply and Operations Management. 2019			
Fikadu Ejeta, Diriba Feyisa, Oliyad Kabede, Desalegn Feyissa Mechessa, Ameha Zewudie, Yitagesu Mamu, Tolocha Regasa, Lemi Abebe. Logistics Management of COVID-19 Personal Protective Equipment and its Challenges at Public Hospitals of Southwest Ethiopia: An Integrated Quantitative and Qualitative Study. International Journal of Medical Research & Health Science. 2021.	Research with qualitative and quantitative methods	None of the hospitals had reported to the supplier and placed an order for personal protective equipment because of the following reasons: - All hospitals did not use logistics record-keeping tools (bin cards) for PPEs, except surgical gloves and disposable gloves - Shortages at supplier sources, budget restrictions, the complexity of the procurement process, overconsumption, and transportation restrictions were difficult to overcome.	https://www.ijmrhs.com/author/lemi-abebe-10163
Hana Pratiwi Mundari, Amran Razak, Andi Surahman Batara. Study of Logistic Management in Pharmaceutical Installation RSUD Raha District, Muna	Research with qualitative method	- The study's findings show that planning (done by the head of installation and management, drug selection based on stock depletion, needs, disease patterns, and demand, determining the number of drugs needed based on empty medications, most recent drug stocks, ABC analysis system, disease patterns, and past use), procurement (done at any time when the drug will run out, based on tenders and direct purchases, reordering occurs when the	**DOI:** https://doi.org/10.56338/pjkm.v10i2.1366

Authors, Title, Journal Identity, Year	Design / Method	Findings	Article Link
Sulawesi Tenggara in 2019		drug stock is empty at the distribution center) tor	

The researcher will briefly explain the logistics management flow of consumable medical goods. The logistics management of medical consumables in this article begins with planning, budgeting, procurement, receipt, storage, maintenance, distribution, control, deletion, recording, reporting, and monitoring evaluation. All these things are done to achieve good logistics management and can advance the hospital in terms of logistics.

Overview of waiting time for outpatient medication at the hospital

A. Planning

Medical consumable logistics management determines how other management tasks will be performed, the planning function in health management is the most crucial one. Health planning is a method for formulating community-based health issues, identifying needs and resources, identifying the most fundamental program goals, and creating workable solutions to reach the objectives. (Nugraheni & Kirana, 2021)

To ensure that the criteria for the correct type, proper quantity, timely delivery, and efficiency are met, needs planning calculates the amount and time frame for purchasing pharmaceutical preparations, medical devices, and consumables.(Rahmiyati et al., 2022) Because the planning process aims to increase efficiency in the use of drugs and medical consumables, increase rational use of drugs, and get an estimate of the type and amount of medicine and medical consumables close to the need, it has a significant impact on the availability in hospitals. (Day et al., 2020)

B. Budgeting

The activities and efforts involved in this budgeting function comprise formulating the specifics of assessing demands regularly, namely the currency scale. (Day et al., 2020) While private hospitals rely on each hospital's provisions, government hospitals are funded by the government budget.(Mundari et al., 2020) Consumables purchases, repairs and maintenance, storage and distribution, research and development, administrative enhancements, and staff supervision and training must all be covered by the allocated budget.(Yang et al., 2021) Using established planning fundamentals, including consumption, epidemiology, and the combination of consumption and epidemiological methodologies, this planning is carried out to prevent medicine shortages and is adjusted to the available budget.(Noorhidayah et al., 2022)

C. Procurement

The procurement role entails the efforts and actions taken to ensure availability, in the appropriate quantity, at the proper time, and at a competitive price that complies with quality criteria.(Puspasari, 2021) Pharmaceutical preparations, medical devices, and consumable medical materials must have distribution permit numbers and expiration dates of at least two years, except pharmaceutical preparations, medical devices, and consumable medical materials, which must be accompanied by a certificate of analysis for medicinal raw materials and a Material Safety Data Sheet (MSDS) for hazardous materials.(Lahung et al., 2022) A successful procurement strategy must guarantee affordability, quantity, and time while maintaining quality standards. The procurement process is a continuous one that begins with selection, determination of the necessary amount, adjustments between demands and resources, choice of procurement methods, choice of suppliers, choice of contract details, supervision of the procurement process, and payment.(Slamet & Sjaaf, 2022)

D. Receipt

The activities carried out to ensure the type, specification, quantity, quality, delivery date, and price agreed upon in the contract are the receiving function.(Siahaan & Hamzah, 2017) The correct storage of all records about the receipt of goods is required.(Slamet & Sjaaf, 2022) It is important to do many legality checks in the reception function, accept medications that match the order letter signed by the pharmacy manager and the delivery invoice, and keep track of medication return facilities that are about to expire.(Arora & Gigras, 2019)

E. Storage

Before distribution, the storage function is carried out. Pharmaceutical requirements, including those for stability, sanitation, light, humidity, ventilation, and classification of different types of pharmaceutical preparations, medical devices, and consumables, must be followed during storage to ensure the quality and safety of pharmaceutical preparations, medical devices, and consumables.(Alfarizi & Ngatindriatun, 2022) Drugs and chemicals with clear labels, high concentrations of electrolytes stored outside the treatment unit, high concentrations of electrolytes secured with clear labels and stored in restricted spaces, pharmaceutical preparations, medical equipment, and medical materials are some elements that need to be taken into account.(Rushton et al., 2014) Consumables brought by the patient must be kept separate and labeled, and the drug storage room cannot be utilized to keep anything else.(Rahmiyati et al., 2022)

F. Maintenance

Pharmacists are responsible for maintaining drug inventory to protect medicines from damage, expiration, and loss.(Magdalena et al., 2018) By avoiding exposure to direct sunlight, conducting routine inspections under the management cycle, keeping the storage environment, and avoiding the risk of storing flammable drugs like alcohol, efforts are made to maintain and protect the quality and quantity of drugs from the things mentioned above.(Arora & Gigras, 2019; Mundari et al., 2020)

G. Distribution

Medical consumables distribution consistently and equally provides drugs to health service units to meet their pharmacological demands.(Liu et al., 2016) The objective is to supply the health service units in the public health center or hospital working area with the proper type, quality, quantity, and timing of drugs.(Rahmiyati et al., 2022) To address the needs of health service institutions like hospitals, drug distribution entails the production and delivery of high-quality medications with assurances of their validity and the proper type and quantity from the drug warehouse consistently.(Day et al., 2020)

H. Control

The control role is carried out for the use of pharmaceutical preparations, medical equipment, consumable medical supplies, and all types and amounts of supplies.(Leaven et al., 2017; Noorhidayah et al., 2022) Control is exercised by the hospital's pharmacy committee/team and the pharmacy and therapy installation.(Beldek et al., 2020) The use of medications under the hospital formulary, the use of medicines per diagnosis and therapy, and controlled effective and efficient supplies are a few reasons why medical consumables are managed in hospitals.(Mathur et al., 2018)

I. Deletion

Pharmaceutical preparations, medical equipment, and consumable medical materials that cannot be used must be destroyed and removed in a way that complies with the requirements of the relevant laws and regulations.(Kanda & Iravo, 2015; Khodadadi et al., 2021) Pharmaceutical preparations, medical devices, and consumable medical

materials are destroyed if they do not satisfy quality standards, are outdated, do not meet usage standards, have had their distribution permits withdrawn, or are otherwise controlled.(Mushoddaq, 2019; Yasrizal & Darmawan, 2022) The kind, quantity, and use of pharmaceutical preparations, medical devices, and consumable medical supplies are all under control.(Febreani & Chalidyanto, 2016) The Pharmacy Installation at the Hospital and the Pharmacy and Therapeutic Team perform this control.(Firdaus et al., 2021)

J. Report Recording

The goal of report recording is to keep track of the movements of medical supplies into and out of the hospital installation environment.(Puspasari, 2021; Siahaan & Hamzah, 2017) If a drug's quality is subpar and needs to be removed from circulation, having documents on hand makes it easier for officers to perform searches.(Rahmiyati et al., 2022) Either digital or manual recording methods are available. The pharmacy installation produces reports regularly within a predetermined time frame (monthly, quarterly, semester, or yearly).(Alfarizi & Ngatindriatun, 2022)

K. Monitoring Evaluation

An organized, ongoing evaluation program that is qualitative and quantitative evaluates the logistical management of medical consumables.(Lahung et al., 2022; Puspasari, 2021) The evaluation's goals are to get a broad picture of the current situation based on the medical supplies being used, compare the pattern of supply use over time, offer suggestions for better supply usage, and determine the impact of interventions on the pattern of supply use.(Arora & Gigras, 2019) Additionally helpful as a planning and decision-making tool, this activity.(Lahung et al., 2022) Monitoring and assessment can be done sequentially and regularly.(Ejeta et al., 2021) Monitoring and evaluation are done to boost hospital pharmaceutical supply managers' output to function at their peak.(Rahmiyati et al., 2022; Susanti Abdulkadir et al., 2022).

The limitation of this paper is limited issues with research samples and select a lack of previous research studies on the topic, more journals discuss the logistics management of drugs compared to medical consumables, so the available articles are very few.

CONCLUSION

This research significantly impacts the logistics management role of medical consumables since the hospital sector depends not only on the strength of human resources but also on logistics management. The percentage of research on the logistics management of medical and hospital consumables might be increased to promote efficiency because medical consumables are just as necessary as hospital operations. In order to increase hospital quality, logistics management of medical consumables is a hospital operation that must be followed precisely and accurately. Improve the logistics management processes continually as well. Providing high-quality and affordable healthcare services is impossible without effective logistical management of medical supplies. The results of earlier studies show that the logistical management of health care is much slower than in the industry.

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