

Analysis of Periodic Self-Assessments within the Scope of Health Quality Standards in terms of Material Management as a Preventive Activity: A Retrospective Study in a University Hospital

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ABSTRACT	
<p>Corresponding Author Nevzat DEVEBAKAN</p> <p>DOI https://10.48121/jihsam.1509562</p> <p>Received 03.07.2024</p> <p>Accepted 26.10.2024</p> <p>Published Online 31.10.2024</p> <p>Key Words Material Management, Health Quality Standards, Periodic Self-Assessments, Root Cause Analysis</p>	<p><i>This study aims to investigate the effects of periodic self-assessments on materials management within the framework of quality management in healthcare. The retrospective study, conducted in a university hospital, evaluates the effectiveness of quality improvement initiatives and compliance with health standards, while examining in detail the effects of these processes on materials management. It also investigates how self-assessment processes improve healthcare service delivery and contribute to materials management processes. Problems identified through Fishbone and Pareto analysis are examined, prioritised and solutions are developed. The findings obtained aim to improve material management processes and increase quality standards in health. The main purpose of the research is to examine the effects of periodic self-assessments on materials management in order to improve the quality of healthcare services. The findings emphasise the importance of maintaining quality standards in health services and systematic handling of periodic self-assessments. Problems identified by Fishbone and Pareto analysis are analysed by root cause analysis and solutions are developed. This approach aims to contribute to the development of materials management processes and to the improvement of quality standards in healthcare. The results of the research are an important guide for practitioners, managers and policy makers in the fields of quality management and materials management in health services.</i></p>

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1. INTRODUCTION

Quality management in healthcare services is a comprehensive approach that aims to increase patient satisfaction and ensure the effectiveness and efficiency of healthcare services. This scope includes various elements such as meeting patients' expectations from health services, improving health outcomes, increasing the accessibility of health services and ensuring the continuity of health services. Quality management requires continuous monitoring and improvement of the quality of services provided by hospitals and healthcare organizations in order to increase patients' satisfaction with healthcare services. (Fatima et al., 2018). Patients' satisfaction is considered a reflection of the quality of healthcare services and this satisfaction influences patients to follow health advice and achieve the best health outcomes (Chakravarty, 2011).

Quality management in healthcare also includes the effectiveness of healthcare services. This includes the effective management of patients' treatment processes, reducing medical errors and improving patients' health outcomes. Quality management in healthcare aims to enable healthcare providers to take the initiative to promote quality and deliver better healthcare services (Sharma & Tripathi, 2022). In addition, quality management in healthcare includes improving the accessibility of healthcare services and ensuring the continuity of healthcare services. This is important to ensure that patients have easy access to health services, to ensure the sustainability of health services and to improve the overall health status of the community (Ansu-Mensah et al., 2019). Quality management in healthcare also includes the cost-effectiveness of healthcare services. Cost-effectiveness ensures optimization of the way health services are delivered, efficient use of resources and sustainability of health services. (Kılıçarslan, 2018). This in turn supports the reach of health services to the masses and the improvement of the overall health status of the population.

Türkiye has made significant progress in improving its health system and services over the years. The Health Transformation Program (HTP) in Türkiye has been instrumental in improving the accessibility and quality of healthcare services for the population (Alawa et al., 2019). The implementation of the HTP has resulted in a reduction in out-of-pocket expenditures for health services, an increase in human resources, an increase in patient satisfaction, and an expansion of health insurance coverage, especially for low-income groups. Turkey's health sector has undergone significant transformations and improvements through various initiatives and reforms, leading to improved access, quality and outcomes of health services for both its population and refugee communities. The country's focus on leveraging technology, developing health information systems and investing in healthcare

infrastructure has played a crucial role in driving these positive changes.

Health services are as old as human history and are a fundamental condition for people to live a healthy and happy life. Healthcare institutions are institutions that should provide quality service with safe and functional physical conditions for all stakeholders receiving services. Accredited hospitals are preferred by patients because they provide services in accordance with predetermined standards. Quality standards in healthcare include various aspects such as patient safety, effectiveness of care, patient-centeredness, timeliness, efficiency and equity (Spooner & Classen, 2009). The International Organization for Standardization (ISO) defines standards as a formula that defines the best way to perform a task, ensures a certain level of quality or behavior, and serves as a unit of measurement (Kelly et al., 2022).

In the context of healthcare, quality standards play a crucial role in ensuring that healthcare services meet defined criteria for safety, effectiveness and patient satisfaction. These standards are designed to provide a basis for comparing health outcomes, resource utilization and healthcare costs, as well as to establish uniform definitions for healthcare professionals and organizations (Barfield et al., 2012). Quality standards aim to improve the overall quality of healthcare and enhance patient outcomes by emphasizing variation in practice and ensuring the implementation of safe and acceptable care (Kelly et al., 2022).

The implementation of quality standards in healthcare organizations has been shown to have a positive impact on the motivation and performance of healthcare professionals (Tamer, 2021). Healthcare organizations can increase the efficiency and effectiveness of their services by adhering to established quality standards, which can lead to improved patient care and outcomes. In Turkey, the development of quality standards in healthcare plays a critical role in improving the service quality of public hospitals (Avcil & Uslu, 2022). This shows that setting and implementing standards in healthcare services is vital for the safety and satisfaction of patients. For hospitals in Turkey, the Health Quality Standards (HQS), particularly Version 6, provide a comprehensive framework designed to enable hospitals to deliver high-quality, efficient and patient-centered care. These standards include a list of health quality indicators that hospitals should monitor to maintain and improve their services. The key focus areas of these indicators include patient safety, clinical effectiveness, patient-centeredness, timeliness, efficiency and equity. Periodic self-assessment is an integral part of quality management in health. This process enables healthcare organisations to continuously improve service delivery, increase patient safety and improve the quality of healthcare services. Determination and implementation of quality standards in health should be supported by increasing the level of

education and knowledge of healthcare professionals (Yıldız, 2018 ; Çiftcibaşı, et.al., 2022 ; Çerçi & Baykal, 2022).

The aim of the study is to examine the effects of periodic self-assessments to improve the quality of healthcare services in terms of materials management. In this context, the retrospective study conducted in a university hospital evaluates the effectiveness of quality improvement initiatives and the level of compliance with health standards. The main objective of the study is to reveal how self-assessment processes improve healthcare service delivery and the effects of these processes on materials management. It also examines how these processes contribute to reducing errors, increasing efficiency and improving patient outcomes. Thus, the importance of adhering to quality standards and conducting periodic self-assessments in healthcare delivery will be emphasized and the benefits of addressing these processes in a systematic and methodological manner will be demonstrated. In this context, the problems identified were first examined and prioritized in detail using Fishbone and Pareto analysis. These analyses helped to identify which problems are the most important and require urgent solutions. Then, root cause analysis was applied to the identified error types and the root causes underlying these problems were revealed. In the light of the data obtained, effective and feasible solutions were developed for each problem. This systematic approach aims to contribute to improving material management processes and raising quality standards in healthcare.

1.1. Quality Standards in Health And Periodic Self-Assessments

Health quality standards are an important issue that aims to improve the efficiency, safety and quality of care provided in health services. Developed and implemented by the Ministry of Health, HQS play a critical role in ensuring patient safety, improving service quality and increasing patient satisfaction in healthcare organizations (Esen & Çalışkan , 2021 ; Yaprak, 2016). These standards are used in various fields such as determining the quality perception of employees in hospitals and other healthcare organizations, protecting patient privacy, evaluating the quality of medication management. (Koç & Güven, 2023 ; Kutsal et al., 2022).

Health quality standards are recognized as an important tool to support improvements in healthcare. For example, these standards are used in a wide range of areas, from evaluating hospital websites to analyzing patient experiences (Karaca & Usta, 2020; Çakıt, 2023). In addition, these standards aim to improve the organizational structure and communication of healthcare organizations, ensure employee safety and increase patient satisfaction. (Karaca & Usta, 2020 ; Şantaş et al., 2021).

Health quality standards also play an important role in determining and implementing health policies at the national level. For example, it is stated that these standards are effective in improving the service quality of public hospitals in Turkey. (Avcil & Uslu, 2022). Furthermore, these standards form the basis of programs developed to improve the quality of health care at the national level (Maphumulo & Bhengu, 2019; Yaprak, 2016).

Periodic self-assessments of quality in health are an important tool for continuous evaluation and improvement of the care provided in health services (Kutsal, et.al., 2022). These assessments are carried out at regular intervals to determine the service quality of healthcare organizations, identify deficiencies and ensure compliance with quality standards. Quality in health periodic self-assessments aim to ensure that organizations continuously review themselves and ensure their development (Al-Hanawi, 2018; Alkhenizan & Shaw, 2011). These self-assessments are usually conducted in accordance with quality standards set by the Ministry of Health and assess the extent to which organizations comply with these standards (Stefanoski & Stefanoska, 2022). For example, self-assessments focusing on specific areas, such as assessments of palliative care clinics, can help to develop strategies to improve the quality of these services. They can also help to identify and control risks that may affect the health and safety of staff and patients (Panagioti, et al., 2014 ; Paudyal et al., 2015; Mitchell et al., 2019).

“Periodic self-assessments of quality in health are an important step to improve the quality of health services at hospital and clinic level. These assessments can include elements such as accurate diagnosis and treatment to meet patients' expectations, a clean hospital environment and friendly healthcare professionals. In addition, these assessments can focus on quality improvement at hospital and clinic level, leading to more efficient and reliable healthcare services. (Jaya, et al., 2024 ; Wu et al., 2021). Periodic self-assessments of quality in health are an important tool for increasing the competencies of health professionals, ensuring patient satisfaction and improving the overall quality of health services. These assessments are conducted with the aim of identifying training needs of health personnel, addressing gaps in service delivery and promoting continuous improvement. In addition, these self- assessments can also assess factors such as work stress, fatigue and job satisfaction of healthcare staff. (Bowdoin et al., 2016 ; Koornneef et al., 2018 ; Estrella & Frazier, 2023). Periodic self-assessments are a comprehensive review conducted at regular intervals to assess how well an organization or a process meets established objectives and standards. These assessments help organizations monitor their performance, make improvements and maintain compliance with quality standards. The

importance of periodic self-assessments is that they encourage continuous improvement and enable organizations to achieve their goals. These assessments help organizations identify their strengths, identify weaknesses and determine future strategies (Tricco, et al., 2018)

1.2. Materials Management And Importance In Healthcare

The process of materials management in healthcare covers the process of effectively planning, procuring, storing, distributing and using the materials and inventories of healthcare organizations. This process is important to improve the quality of healthcare services, reduce costs, ensure environmental sustainability and guarantee patient safety. Materials management is the most mature macro process in hospitals and an important issue in health systems as it affects clinical and financial outcomes (Iannone et al., 2013). This includes effective management of the material supply chain, accurate tracking of inventory and appropriate use of materials.

The materials management process in healthcare includes steps such as determining the material needs of hospitals, managing relationships with suppliers, optimizing inventory levels and regulating material flow (Alemsan et al., 2021). This process requires combining demand forecasting methods with inventory management and promotes systemic improvements in healthcare organizations. In addition, both human and material resources need to be managed effectively in the materials management process. Research shows that ineffective management of material and human resources can negatively affect the quality of health services (Torrent-Ramos, et al., 2021).

Materials management also includes inventory management. Effective inventory management in healthcare organizations ensures that medicines and other medical supplies are constantly available. This both improves the quality of patient care and reduces costs. Furthermore, optimizing inventory management practices can improve the accessibility and affordability of healthcare services (Durmuş, 2023).

1.3. Literature Research

Periodic self-assessments within the scope of healthcare quality standards are very important preventive measures that can significantly affect the overall quality of healthcare delivery. By conducting retrospective studies, as proposed in a university hospital, insights can be gained into the effectiveness of quality improvement initiatives and adherence to established standards. The literature review on this topic covers a large number of references that shed light on various aspects related to healthcare quality standards, materials management and preventive measures.

Periodic self-assessments within the scope of health quality standards are very important preventive measures that can significantly impact the delivery of health services. As emphasized by Maphumulo and Bhengu, improving quality in healthcare leads to reduced errors, increased efficiency and ultimately better patient outcomes (Maphumulo & Bhengu, 2019). As emphasized by Chen et al., the provision of high-quality data is essential for the accurate evaluation of the effectiveness of public health interventions (Chen et al., 2014). Total Quality Management plays a vital role in achieving competitive advantage in healthcare settings, as discussed by Powell (Powell, 1995).

Assessing the quality of health information systems is strategically advantageous for improving the quality of patient care, as studied by Noël et al. (Noël, Pereira-Vale, & Márquez, 2022). The establishment of quality standards, such as those outlined by Baldwin et al. for the management of pulmonary nodules, sets benchmarks for excellence in healthcare practice (Baldwin, et al., 2018). As suggested by Triantafillou, integrating electronic health records to support quality management can streamline processes and improve care delivery (Triantafillou, 2017). As argued by Nylenna et al., the inclusion of patient perspectives is essential for the comprehensive assessment of healthcare quality (Nylenna et al., 2015). As suggested by Mogakwe et al., creating positive work environments promotes compliance with quality standards and improves patient outcomes (Mogakwe et al., 2019). As discussed by Lega et al. management practices play an important role in improving health system performance and sustainability (Lega et al., 2013).

As emphasized by Condliffe et al., the implementation of quality measures plays a key role in improving healthcare structure, processes and outcomes (Condliffe, et al., 2020). Understanding the factors that influence the implementation of quality standards is essential for successful quality assurance in healthcare facilities, as explored by Matahela et al. (Matahela et al., 2023). As suggested by Spangler, adapting assessment approaches to local realities can lead to more effective service delivery (Spangler, 2012).

An important point emphasized in the references is the importance of separately assessing the methodological quality of studies and instruments in systematic reviews (Terwee, et al., 2011). This distinction is crucial to ensure that the assessment of healthcare quality standards is comprehensive and accurate. Understanding the challenges of quality improvement in healthcare, particularly in post-apartheid South Africa, highlights the need to reduce errors, increase efficiency and improve the overall quality of care delivery (Maphumulo & Bhengu, 2019). This underscores the multifaceted nature of quality improvement efforts in health systems. Infrastructure plays a vital role in determining the quality of care

observed in health services, as demonstrated by a cross-sectional study conducted in several countries (Leslie et al., 2017). The availability of necessary equipment, supplies and well-trained staff directly affects the quality of healthcare services provided. Similarly, service readiness for inpatient care of small and sick newborns is crucial and requires comprehensive assessments of the readiness and capacity of the health facility (Moxon, et al., 2018). These assessments are essential components of providing high-quality care for vulnerable populations. In conclusion, the synthesis of the literature review on periodic self-assessments under health quality standards as a preventive measure from a materials management perspective reveals the complex interplay between methodological quality assessments, infrastructure preparation, cost-effectiveness analyses, infection control programs, and patient-reported outcome measures in ensuring high-quality healthcare delivery. By bringing these different perspectives and approaches together, health systems can proactively address challenges, improve quality of care and ultimately improve patient outcomes.

2. MATERIALS AND METHOD

The study aims to retrospectively analyze the effects of periodic self-assessments on materials management in a university hospital. In this context, the results of self-assessments conducted in accordance with the health quality standards determined in the hospital were collected. The data included the results of the evaluations conducted over a certain period of time and data related to materials management. The collected data were evaluated using quantitative and qualitative analysis techniques. Quantitative analyses included analysis of the results of periodic self-assessments, while qualitative analyses provided a more in-depth examination of changes in materials management processes. In particular, the relationship between self-assessment results and materials management data was analyzed to reveal how these two factors influence each other. The results of self-assessments conducted in different periods were compared and changes over time were analyzed. By interpreting the research findings, the preventive effects of periodic self-assessments on materials management were identified and the contributions of these processes to healthcare service delivery were detailed. As a result, the improvements in materials management brought about by self-assessments and their potential to improve the quality of healthcare services were demonstrated.

Retrospective analysis refers to a methodological approach in research and health care that involves looking at past data or events to analyze outcomes, patterns or trends (Pérez-Fernández, et al., 2020). This type of analysis is widely used in various fields such as medicine, psychology and biology to assess the impact of specific interventions, treatment strategies or

research initiatives (Hanney, et al., 2013). By examining historical data, researchers can gain valuable insights into the effectiveness of past practices, inform future decision-making and contribute to the advancement of knowledge in their field (Ahmed, et al., 2019). In summary, retrospective analysis serves as a valuable tool in research and healthcare settings, allowing researchers to gain insights from historical data, evaluate treatment strategies and inform future practice. By looking at retrospective information, researchers can uncover patterns, trends and relationships that contribute to advancing knowledge and improving patient outcomes. Pareto analysis, a technique derived from the Pareto Principle, also known as the 80/20 rule, is a method used to prioritize and evaluate the distribution pattern of elements according to their importance or impact (Fageha & Aibinu, 2014). This analytical approach is widely used in various fields to identify the critical few factors that contribute significantly to a particular outcome or result and to separate them from the many less important factors (Mapes, 2015) By applying Pareto analysis to elements of the project scope, stakeholders can streamline decision-making processes, allocate resources efficiently, and improve project performance by addressing the most critical components first. This approach is in line with the fundamental principle of Pareto optimization, which emphasizes maximizing results by focusing on the most influential factors (Fageha & Aibinu, 2014).

Root cause analysis is a systematic method used to identify the underlying causes or origins of a problem or non-compliance, aiming to address problems at their core rather than merely treating symptoms (Wahed, et al., 2010). In contexts as diverse as healthcare, manufacturing and project management, root cause analysis serves as a valuable tool to investigate events, errors or deviations to understand the factors and systemic issues that lead to unintended consequences (Zohourian, et al., 2017). Through techniques such as fishbone diagram, 5 Whys method or correlation processing algorithms Root cause analysis helps identify the real causes of problems, enabling organizations to implement targeted solutions and improve processes (Gokozan & Michael, 2020). Furthermore, root cause analysis is effective in improving quality control, productivity and operational efficiency by identifying and addressing the root causes of quality-related problems in production processes. By focusing on root cause identification, organizations can prevent problems from recurring, optimize the quality of outputs and minimize losses due to unstable processes (Mahto & Kumar, 2008).

2.1. Purpose and Type of Research

The aim of this study is to examine the effects of periodic self-assessments conducted within the scope of quality standards in healthcare as a preventive activity in terms of materials management.

Specifically, it is to investigate the potential of these assessments in a university hospital to improve materials management by identifying problems in materials management processes and identifying the root causes of these problems. The research aims to assess the impact of critical factors such as lack of management support, lack of strategy, communication problems, and use of poor quality materials, inappropriate storage conditions and lack of training on materials management. This study is a type of retrospective research. Retrospective studies aim to analyze the current situation and make inferences for future improvement activities by examining events that took place in a certain period in the past. In this context, by analyzing the periodic self-assessments previously conducted at the university hospital and the data resulting from these assessments, the root causes of the problems encountered in material management processes were identified and strategic recommendations were developed to solve these problems.

2.2. Population and Sample of the Study

The population of this research is the university hospitals in Türkiye. In particular, university hospitals that regularly evaluate material management processes within the scope of quality standards in health and aim to use these evaluations in line with preventive activities constitute the main population of the study. The sample of the study is the periodic self-assessments conducted in a specific university hospital and the results of these assessments. In the selection of the sample, a university hospital that adopts quality standards in health and aims to improve its material management processes was preferred in accordance with the objectives of the study. The relevant stakeholders such as the personnel working in the materials management department of this hospital, material suppliers, warehouse managers and senior management members were also included in the scope of the study. In this way, a detailed analysis of the problems experienced in the material management processes of the university hospital within the scope of the study and the root causes of these problems was carried out.

Due to the retrospective nature of the study, the data obtained from the periodic self-assessments conducted in the past were analyzed. Accordingly, all self-assessments conducted over a certain period of time (2018-2023) and the data collected during this process constituted the sample size. This data was used to identify critical issues in materials management and the root causes of these issues.

Table 1: Corrective and preventive activity (CPA) monitoring

CN	Audit Type	Department	Date	Definition of Nonconformit
10	Internal Audit	Pediatric Emergency clinic	18.04.2018	Material Management Process
58	Internal Audit	Coronary Angio Unit	20.04.2018	Material Management Process
147	Internal Audit	Operating room	24.04.2018	Material Management Process
191	Internal Audit	Medical Genetics Polyclinic	2.05.2018	Material Management Process
242	Internal Audit	Radiology Angiography Unit	20.04.2018	Material Management Process
243	Internal Audit	Radiology Angiography Unit	20.04.2018	Material Management Process
296	Internal Audit	Gynecology clinic	30.04.2018	Material Management Process
315	Internal Audit	Endoscopy Unit	19.04.2018	Material Management Process

CN: CAP Number

Table 1 lists the non-conformities related to material management identified in various units of the hospital as a result of internal audits conducted on a specific date.

2.3. Limitations of the Study

This research has several limitations and these limitations may affect the generalizability and applicability of the results. First, the study only covers periodic self-assessments conducted in a specific university hospital and other university hospitals or health institutions were excluded. This limits the generalizability of the research findings to all university hospitals. Secondly, the data used in the study were retrospective and obtained from self-assessments conducted in the past. The accuracy and completeness of these data depend on the consistency of past records, and missing or inaccurate data may negatively affect the results of the study. Third, the time span of the research is limited to a specific period, so long-term trends and changes may be ignored. Furthermore, changes in healthcare quality standards and material management processes may vary over time. Fourth, the participants in the study consisted of staff and relevant stakeholders working in the materials management department of a specific university hospital; their views and experiences may not reflect the views and experiences of all employees in the general healthcare sector. Finally, the research is a retrospective study and is based on the analysis of

available data. This methodological approach may be limited in fully revealing cause and effect relationships. Moreover, the subjectivity of the self-assessment data and the differences in the methods used in the assessment process may also affect the consistency of the results. Being aware of these limitations, caution should be exercised in interpreting the results of the study and caution should be exercised in generalizing the findings. It is recommended that these limitations should be eliminated and more comprehensive studies should be conducted for future studies.

2.4. Data Collection and Analysis

The data collection process was carried out using the hospital's quality management system records. In the study, Corrective Preventive Action (CPA) data between 2018 and 2023 were analyzed retrospectively. During this period, all the CPA records made in the hospital were classified into two main categories: the number of general CPA and the number of CPA related to material management. Data were obtained from the hospital's quality control unit and materials management department. During this period, CPA records were collected and the total number of CPA and the number of material management related CPA were determined for each year. The collected data was analyzed in detail to assess the impact of the hospital's quality improvement efforts and changes in materials management processes. In this way, it was aimed to better understand the effects of periodic self-assessments on materials management and to develop recommendations for improving quality standards in healthcare services.

Table 2: Number of CPA

Year	2018	2019	2020	2021	2022	2023
Number of CPA	494	59	16	45	439	458
Material Management Related Corrective Preventive Action (CPA)	56	12	3	18	150	80

The data on the number of Corrective Preventive Actions (CPA) and the number of material management related CPA between 2018 and 2023 reflect the fluctuations and focus of the hospital's quality improvement process. While the overall number of CPA was as high as 494 in 2018, there was a significant decrease in 2019 and 2020; in particular,

the number of CPA in 2020 was only 16. This decline may be related to the effects of the global COVID-19 pandemic. In 2021, the number of CPA increased again, reaching 45, before rising to 439 in 2022 and 458 in 2023.

A similar fluctuation was observed in the number of CPA related to material management. The number of 56 in 2018 decreased to 12 in 2019 and 3 in 2020. Rising to 18 in 2021, the number increased significantly to 150 in 2022 and reached 80 in 2023.

2.5. Application

It was examined within the scope of the Quality Standards in Health (QSH) published by the Ministry of Health to determine quality standards in health services and to ensure improvement. According to Version 6 of QSH, internal quality audits in healthcare organizations stand out as an important tool to improve service quality and ensure its continuity. Generally, internal quality audits are conducted at least once a year. However, the frequency of audits may vary depending on the size, type and service area of health organizations. Large and complex healthcare organizations are usually audited more frequently, while the frequency of audits may be lower for small-scale organizations or organizations providing private sector services.

First of all, hospital management and relevant departments were contacted to obtain information about the periodic self-assessment processes carried out within the scope of the QHS. Then, the audit criteria and criteria affecting material management processes were identified.

In this study, it is aimed to analyze periodic self-assessments conducted within the scope of Health Quality Standards in terms of materials management as a preventive action. Accordingly, CPA related to materials management were analyzed using the Fishbone Diagram (Ishikawa Diagram) within the scope of a retrospective study conducted in a university hospital. The diagram was used to identify the root causes of materials management problems and to categorize and analyze these causes.

The Fishbone manpower, materials, methods, machines, measurement, and environment (Radziwill, (2017). Under the manpower, reasons such as lack of training, inexperience and lack of motivation were included. Lack of training resulted in staff not fully understanding the material management processes and making mistakes in these processes. Inexperience led to difficulties in learning the correct materials management practices, especially for new employees. Lack of motivation led to staff not doing their jobs diligently enough and making mistakes in the processes.

Figure 1: Material Management Related to CPA

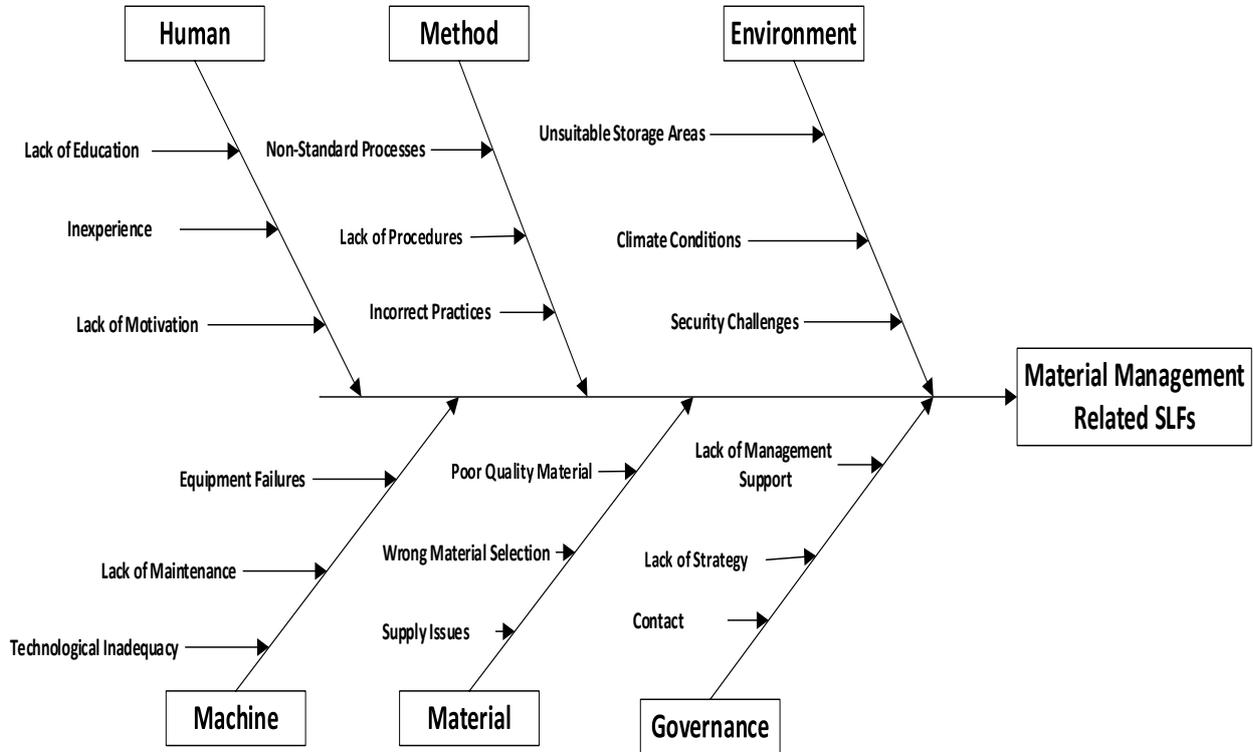
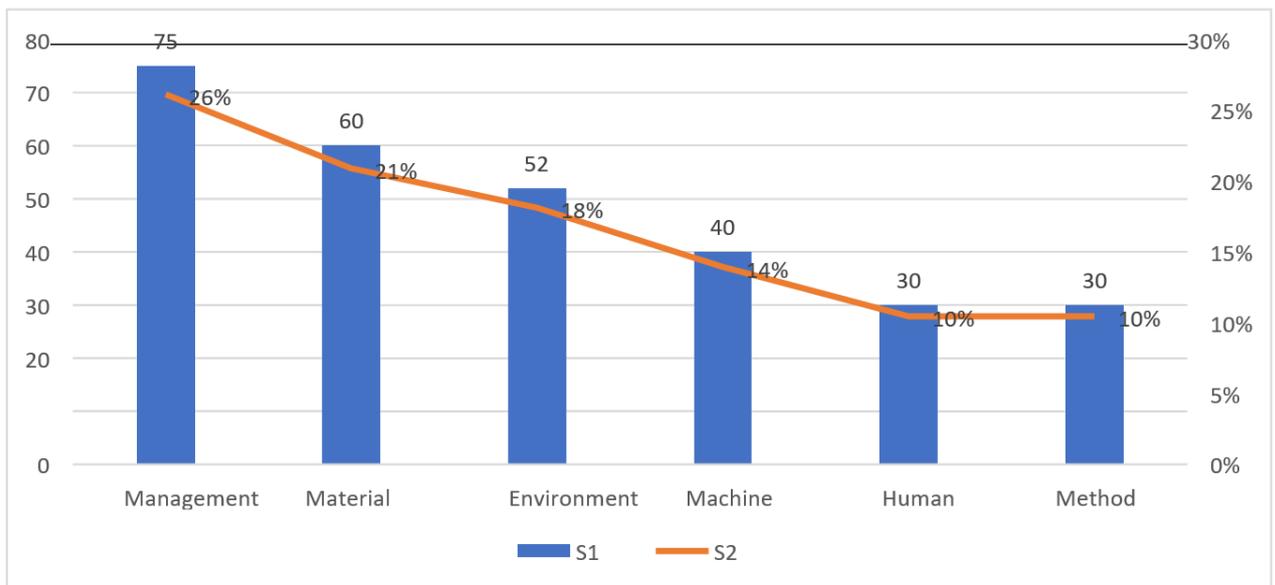


Figure 2: Pareto Analysis



Devebakan, N., Durmuş A. (2024). Analysis of Periodic Self-Assessments within the Scope of Health Quality Standards in terms of Material Management as a Preventive Activity: A Retrospective Study in a University Hospital. *Journal of International Health Sciences and Management*, 10(20): 112-125

In the method category, reasons such as non-standard processes, lack of procedures and incorrect practices were identified. Non-standard processes caused material management processes to be inconsistent and disorganized. Lack of procedures meant that the steps required to solve a particular problem were not clear, while incorrect practices were the incorrect application of existing procedures. For example, due to a lack of procedures, staff may not know how to correctly manage material requests, which can lead to delays in the process and incorrect material utilisation.

Under the material category, reasons such as poor quality materials, wrong material selection and supply problems were included. The use of poor quality materials reduced the quality of products or services, the wrong choice of materials meant the use of materials that were not suitable for a particular job, and supply problems were identified as the inability to obtain materials on time and on favorable terms. For example, the selection of inappropriate cleaning materials may lead to the preference of products that are not suitable for use in services and therefore hygiene problems may arise.

In the machinery category, reasons such as equipment breakdowns, lack of maintenance and technological inadequacy were analyzed. Equipment breakdowns caused material management processes to be disrupted, lack of maintenance meant that equipment was not regularly checked and problems could not be identified in advance, and technological inadequacy was assessed as the inability of existing equipment or systems to meet current needs. The lack of regular maintenance of medical devices can lead to unexpected failures during surgery and disruption of critical procedures.

Under the environmental factor, reasons such as unsuitable storage conditions, climatic conditions and security issues were included. Unsuitable storage conditions led to deterioration or damage to materials, climatic conditions, especially temperature and humidity, affected the quality of materials, and security issues increased the risk of theft or damage to materials. Finally, under the management category, reasons such as lack of management support, lack of strategy and communication problems were identified. Lack of management support meant that materials management processes were not sufficiently supported, lack of strategy was defined as a lack of long-term plans and goals for materials management, and communication problems resulted in inadequate or inaccurate information flow in materials management processes. For example, inappropriate storage conditions can cause medicines to spoil and expose sterile materials to the risk of contamination.

The analysis according to these categories provided a comprehensive perspective to identify the root causes of material management related CPA and helped to develop strategies to address the problems. Periodic self-assessments conducted within the scope of health

quality standards enabled materials management issues to be addressed proactively, thus contributing to process improvement.

This chart shows which categories cause the most problems and which categories should be addressed first. In this example, the management, material and environmental categories account for a large proportion of the total problems, so these areas should be prioritized.

The management category has the highest number of issues with 75 issues, accounting for about 26.1% of the total issues. This suggests that management issues such as lack of management support, lack of strategy and communication problems have a significant impact on materials management processes. Resolving management issues can alleviate a large proportion of the overall problems. The material category ranks second with 60 problems, accounting for 20.9% of total problems. Problems related to materials management, such as poor quality materials, wrong material selection and procurement problems, are prominent in this category. Improvements in materials management can eliminate most of these problems. For example, improvements in the material procurement process can minimise operational disruptions and delays by ensuring that critical materials are available on time.

The environmental category covers 18.1% of total issues with 52 issues. Environmental factors such as inappropriate storage conditions, climatic conditions and safety issues play an important role in materials management processes. Improvements in this category will increase the effectiveness of the processes. The machinery category accounts for 13.9% of total issues with 40 issues. Machinery-related issues such as equipment breakdowns, lack of maintenance and technological inadequacy are among the factors that negatively affect materials management processes. Improvements in this area can make processes work more efficiently. Without regular maintenance of equipment, unexpected breakdowns can disrupt operational processes, leading to delays in service delivery.

The human and method categories account for 10.5% of the total problems with 30 problems each. Human factors, such as lack of training, inexperience, lack of motivation, and method issues, such as non-standard processes, lack of procedures, incorrect practices, have a certain impact on materials management processes. Improvements in these categories can improve overall performance. Implementation of regular training programmes for employees can contribute to the reduction of errors in material management processes and increase overall productivity.

Pareto Analysis shows that the categories of management, materials and environment account for a large proportion of the problems associated with materials management. Improvements focusing on these categories can solve most of the overall problems

and increase the effectiveness of materials management processes. Periodic self-assessments conducted within the scope of HQS have enabled these issues to be addressed proactively and thus contributed significantly to the improvement of processes.

3. RESULTS

In the study, a research on periodic self-assessments of quality standards in health services was conducted. The main problems identified using fishbone and pareto analysis were examined in more detail with the Root Cause Analysis method and solutions were developed. Problems and Root Causes can be listed as follows:

- Lack of Management Support, Lack of Strategy and Communication Problems: Uncertainty and lack of communication in senior management.
- Poor Quality Materials, Wrong Material Selection and Supply Problems: Weaknesses in supplier selection and shortcomings in accurate demand forecasting were identified.
- Unsuitable Storage Conditions, Climate Conditions and Safety Issues: Deficiencies in warehouse organization and inadequate security protocols were identified.
- Equipment Failures, Lack of Maintenance and Technological Inadequacy: Deficiencies in maintenance processes and insufficient technological infrastructure were identified.
- Lack of Education, Inexperience and Lack of Motivation: Inadequacy of training programs and lack of motivation were observed.

Table 2: Root Cause Analysis

Problem/RootCause	Action	ResponsibleUnit/Person	CompletionDate
Lack of Management Support, Lack of Strategy and Communication Problems	Clarifying strategic objectives and opening communication channels by organizing meetings with senior management	Senior Management / Hospital Director	Uncertain
Poor Quality Materials, Wrong Material Selection and Supply Problems	Strengthening supplier evaluation processes and using software- based demand forecasting systems	Purchasing Department/ Materials Management Department	Uncertain
Unsuitable Storage Conditions, Climate Conditions and Safety Issues	Establishing warehouse management policies, organizing staff training programs and developing security protocols	Material Management Department / Warehouse Supervisor	Uncertain
Equipment Failures, Lack of Maintenance and Technological Inadequacy	Establish regular maintenance plans, train staff and implement advanced equipment management systems	Technical Services Manager /Clinical Engineering Unit	Uncertain
Lack of Education, Inexperience and Lack of Motivation	Establishing comprehensive training programs, supporting new staff with mentoring systems and implementing performance- based incentive systems	Human Resources Department / Training Coordinator	Uncertain

The table includes the identification of materials management problems in a university hospital and the presentation of proposed solutions. The problems are concentrated in various areas such as lack of management support, material quality, storage conditions, equipment maintenance and staff training. The proposed solution actions for each problem specify the actions to be taken by the relevant units and responsible persons. These solutions can be successfully implemented with the support and coordination of hospital management, but it is important that the process can be monitored and completed in a timely manner. These recommendations provide a comprehensive and strategic approach to the problems faced in materials management in a university hospital. Each problem is assigned to a specific unit or person and held accountable for managing the resolution process. However, the uncertainty of completion dates can make it difficult to track the effectiveness of the solution process. Solution recommendations, such as meetings with top management and clarification of strategic objectives, emphasize the importance of organizational leadership and communication. Furthermore, operational improvements, such as strengthening supplier evaluation processes and establishing equipment maintenance plans, aim to improve the effectiveness of materials management processes. Successful implementation of these recommendations can be possible with the support and cooperation of the hospital management, but it is important that the process can be monitored and completed in a timely manner.

4. DISCUSSION

The findings of this study underscore the critical role of periodic self-assessments in improving materials management within healthcare organizations. By employing tools such as the Fishbone Diagram and Pareto Analysis, the study identified key problem areas and their root causes, offering a comprehensive understanding of the challenges faced in materials management. Significant issues related to management support, material quality, and environmental conditions highlight the need for targeted improvements in these areas. Enhancing management support, improving supplier evaluation processes, and ensuring suitable storage conditions can lead to substantial improvements in materials management, ultimately contributing to better healthcare service quality. The impact of quality management processes, particularly periodic self-assessments, on materials management in the healthcare sector is a critical aspect that significantly influences the quality of healthcare services. A study conducted in a university hospital highlighted the importance of compliance with health standards and the effectiveness of quality improvement initiatives, emphasizing the role of periodic self-

assessments in enhancing materials management efficiency (Clavel et al., 2019).

Moreover, the study reveals the importance of addressing human factors and method-related issues in materials management. Lack of training, inexperience, and non-standard processes were identified as critical factors affecting the efficiency of materials management (Grigorovica et al., 2022 ; Katiyar, 2024). Implementing comprehensive training programs, mentoring systems for new staff, and standardizing procedures can significantly enhance the overall performance of materials management processes. These improvements not only increase operational efficiency but also foster a culture of continuous improvement and accountability within healthcare organizations (Novak, 2024).

The study emphasizes the necessity for a holistic approach to materials management, which includes the integration of technological advancements and regular maintenance of equipment. Tackling technological inadequacies and equipment failures through systematic maintenance plans and advanced equipment management systems can prevent disruptions and enhance process reliability (Dodds et al., 2022). Future research should focus on exploring the impact of these interventions across various healthcare settings to validate and expand upon these findings. By continuously monitoring and refining materials management processes, healthcare organizations can ensure the sustainability and enhancement of quality standards, ultimately leading to better patient outcomes and more efficient healthcare delivery (Scala & Lindsay, 2021).

Lastly, the study emphasizes the need for a holistic approach to materials management, incorporating technological advancements and regular maintenance of equipment. Addressing technological inadequacies and equipment failures through regular maintenance plans and advanced equipment management systems can prevent disruptions and enhance process reliability. Future research should focus on exploring the impact of these interventions across diverse healthcare settings to validate and expand upon these findings. By continuously monitoring and refining materials management processes, healthcare organizations can ensure the sustainability and improvement of quality standards, ultimately leading to better patient outcomes and more efficient healthcare delivery. By adhering to rigorous policies and standards, healthcare entities can strengthen their materials management processes, enhancing operational efficiency and elevating overall quality standards (Omaghomi et al., 2023).

Furthermore, the study highlights the broader implications of effective materials management on the sustainability and advancement of healthcare services. By integrating periodic self-assessments into their quality management processes, healthcare organizations can foster a culture of continuous

improvement and innovation in materials management practices (Novak, 2024). This not only enhances operational efficiency but also bolsters the overall quality of care provided to patients. The study underscores the interconnectedness of quality management and materials management, emphasizing the need for a holistic approach to ensure the long-term viability and excellence of healthcare services (Gerard, 2021).

In conclusion, the synthesis of these findings emphasizes the intricate relationship between quality management processes, particularly periodic self-assessments, and materials management within the healthcare sector. By focusing on effective leadership, strict adherence to quality standards, and continuous quality improvement initiatives, healthcare organizations can optimize their materials management processes, improving operational efficiency and enhancing the quality of care for patients. This holistic approach is vital for the sustainability and ongoing enhancement of healthcare services, ensuring organizations remain at the forefront of delivering high-quality, patient-centric care.

5. CONCLUSION AND RECOMMENDATIONS

This study reveals the significant impact of quality management processes, especially periodic self-assessments, on materials management in the healthcare sector. Using a retrospective study in a university hospital, the evaluation examined the level of compliance with health standards and the effectiveness of quality improvement initiatives and explored in depth the impact of these processes on materials management.

The findings show that periodic self-assessments can be an important preventive activity in terms of material management in health services. Examining the problems identified by methods such as Fishbone and Pareto analysis with root cause analysis and developing solutions increases the effectiveness of this process. In

this context, healthcare organizations focusing on periodic self-assessment processes and managing these processes effectively can increase efficiency in material management processes and contribute to raising quality standards.

The results of the study provide an important guideline for maintaining and improving quality standards in healthcare services. In particular, healthcare organizations focusing on periodic self-assessment processes and managing these processes effectively can increase efficiency in materials management processes and contribute to raising quality standards. In this context, the importance of studies that further examine the effects of periodic self-assessments on materials management to improve the quality of healthcare services and increase the effectiveness of this process should be emphasized.

As a result, it examines the relationship between quality management and materials management in healthcare in depth and emphasizes that this relationship is critical for the sustainability and improvement of healthcare services. The results of this study provide an important roadmap for the sustainability and improvement of quality standards in healthcare.

Acknowledgments:

We thank the management of dokuz eylül university hospital

Conflict of Interest:

The authors declare that they have no conflict of interest.

Ethical Approval (Must be answered): With the letter dated 04.04.2024 and numbered 958311, DEU social and human sciences scientific research and publication ethics committee decision has been taken.

Funding: No

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