NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
BUSINESS ADMINISTRATION PROGRAMME

THE EFFECTS OF LEAN MANAGEMENT APPLICATIONS AND SUPPLY CHAIN ACTIVITIES IN THE HEALTHCARE SECTOR ON ORGANIZATIONAL STRUCTURE

PHD THESIS

İSMAİL HIZLI

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ACCEPTANCE AND APPROVAL

This study titled "Lean Management Practices in Health Sector and Effects of Supply Chain Activities on Organizational Structure" prepared by İsmail HIZLI was found successful as a result of the defense examination held on 30/03/2021 and was accepted as a Doctoral Thesis by our jury.

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I, İsmail Hızlı, hereby declare that this dissertation entitled ‘The Effects of Lean Management Applıcatıons and Supply Chaın Actıvıtıes in the Healthcare Sector on Organızatıonal Structure’ has been prepared myself under the guidance and supervision of ‘Prof.Dr. Nermin Gürhan’ in partial fulfilment of the Near East University, Institute of Graduate Studies’ regulations and does not to the best of my knowledge breach and Law of Copyrights and has been tested for plagiarism and a copy of the result can be found in the Thesis.

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İsmail HIZLI

ÖZ

SAĞLIK SEKTÖRÜNDE YALIN YÖNETİM UYGULAMALARI VE TEDARİK ZİNCİRİ FAALİYETLERİNİN ÖRGÜTSEL YAPI ÜZERİNE ETKİLERİ

Bu çalışmanın amacı Yalın yönetim ve tedarik zinciri faaliyetlerinin örgüt yapısı üzerindeki etkilerini araştırmaktır. Bu amaçla Medipol Üniversitesi Tıp Fakültesi Mega Hastanesi'nde (İstanbul, Türkiye) uygulanmaya başlanan Yalın Sağlık Yönetimi (YSY) faaliyetlerinin etkileri incelenmiştir. YSY ile ilgili olarak hastanenin personel organizasyon yapısındaki değişiklikler ve kişisel görüşlere etkileri analiz edilmiştir. Bu faaliyetler Aralık 2017'de personel eğitimi ve güncellenmiş uygulamalarla başlamıştır. Bu çalışmada, YSY'ne göre örgütsel yapıdaki değişikliklerin sıralı uygulamalar ile değerlendirilmesi ve personelin YSY hakkında personelin görüşlerinin nasıl etkilendiği değerlendirilmiştir. Değer değişiklikleri akış şemaları ile irdelenmiştir. YSY'nin örgütsel yapı üzerindeki etkisi şematik yaklaşım ile incelenmiştir. Personelin YSY hakkında personelin düşüncelerindeki değişiklikleri analiz etmek için 48 sorudan oluşan bir ölçek iki kez, yani hastanemizdeki uygulamadan 12 ay önce ve uygulamalar hayata geçirildikten sonra uygulanmıştır. YSY'nin ve gerçekleştirilen organizasyonel yapı için gerçekleştirilen ardışık uygulamaların etkilerinin, dikey yapının büyük ölçüde verimlilik ve uygunluk açısından önemli olumlu iyileştirmelerle yataylaşmasına neden olduğu belirlenmiştir. Anket sonuçları ile ilgili olarak, YSY ve sıralı uygulamaların sağlanması, personelin genel görüşü, problem çözme, akış yönelimi, kendi kendini yöneten takımlar, görsel kontrol, günlük toplantılar, standartlaştırılmış çalışmalar, koçluk ve destekleme tarzında istatistiksel olarak anlamlı olumlu gelişmeler sağlamıştır. Çalışmanın bulguları, YSY'nin verimliliği, etkinliği ve boşa harcanan zamanı azalttığını, kurumsal işleyen şematik eğrilerin yatay hale geldiğini onayladı. YSY, sistemin temel parçası olarak çalışanların, YSY'nin temelini oluşturan 10 kriterin hepsinde görüş üzerinde olumlu ve anlamlı iyileştirmeler gerçekleştirdiğini göstermiştir. Bu uygulamaların, artan motivasyon ve iş tatmini kaynağı olarak da olumlu olduğu bulunmuştur.

Anahtar Kelimeler: Yalın yönetim, yalın sağlık yönetimi, tedarik zinciri, örgütsel yapı, sağlık sektörü

ABSTRACT

THE EFFECTS OF LEAN MANAGEMENT PRACTICES IN THE HEALTHCARE SECTOR AND SUPPLY CHAIN ACTIVITIES ON ORGANIZATIONAL STRUCTURE

The purpose of this study is to investigate the effects of Lean Health Care Management (LHCM) activities on organizational structure which started to be implemented in Medipol University Faculty of Medicine Mega Hospital (Istanbul, Turkey). The changes in the personnel organization structure of the hospital and the effects on personel opinion are observed regarding LHCM. These activities started in December 2017 with personnel training and updated applications. In this study, it was aimed to evaluate the changes of organizational structure according to LHCM by sequential applications and observing how the personnel's opinion about LHCM was affected. The changes of values were analyzed by flow charts. The impact of LHCM on organizational structure was examined by schematized relevant criteria. For analyzing the changes of personnel's opinion about LHCM, a scale consisting of 48 questions was applied twice, i.e.12 months before and after the application in our hospital. The results were recorded and analyzed. It was determined that the effects of LHCM and realized sequential applications for the organizational structure resulted in the horizontalization of the vertical structure to a great extent with significant positive improvements in terms of efficiency and suitability. Related to the results of the survey, LHCM and supplying sequential applications enabled statistically significant positive improvements in general opinion of personnel, problem solving, orientation of flow, self-managed teams, visual control, daily meetings, standardized works, coaching and supporting style of leadership, basic subjects of LHCM such as 5S-Seiri, Seiton, Seizo, Seiketsu, Shitsuke. The findings of the study approved that LHCM increased the efficiency, effectiveness and decreased the time wasted, while the institutional functioning schematized curves become horizontal. LHCM showed that employees, as the basic part of the system, realized positive and meaningful improvements on opinion in all 10

criteria that form the basis of LHCM. These practices have also been found to be positive as source of increasing motivation and satisfaction of work.

Keywords: Lean management; lean health management; supply chain; organizational structure; health sector.

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ABBREVIATIONS

YSY : Lean Health Management

YYTZ : Lean management and supply chain

DAH : Value Flow Mapping

LSC : Lean Supply Chain

MH : Ministry of Health

CHAPTER 1

INTRODUCTION

1.1.Scope of the Thesis:

Lean management practices are known to reduce patient treatment costs as well as reduce treatment quality and speed, and enable more efficient configuration of hospital staff and hospital units and reduce consumable costs after the application of lean management practices in the automotive manufacturing sector. There are small-scale publications in the literature that report that the implementation of lean management practices in the health sector, which is the most difficult pillar of the service sector, has positive consequences for increasing time, expense efficiency and patient satisfaction, but it is not enough to make a final decision on these applications because the research results contain some contradictions. Lean management practices generally have two main principles; continuous improvement and respect for people. Therefore, employees are considered to be the most important resource for the efficiency concerning improvement in lean organizations, which needs to be respected and developed (Brandao,2009). However, people respect the principle widely unrecognized and unfortunately lean transformations are being ignored by leading senior executives (Antoni,1996). For a long time people neglected perspective in Western lean literature, but afterwards they followed more carefully the recent lean publications (Emiliani,2005, Joosten,2009).

Lean practices in health services positively affect employees and the working environment, as a result, employees can increase their attention regarding

the working environment, as a result, employees can increase their attention regarding waste and productive attitudes to solve problems (Poksinska,2010). In addition, employees can increase their own motivation and reduce the stress by implementing lean health services (Rexhepi,2011). Employee performance is one of the most important factors to have a positive impact on quality improvement (Abdullah,2008).

Improving healthcare related situations has enabled healthcare processes and the role of healthcare workers to be more active. It is important that the employees present a supportive manner in lean management practices (Ramly,2011). Staff satisfaction is an important part of hospital performance evaluation. According to LHCM principles, changes of personnel's opinion realized by organizational structure and flow orientation are important which would affect success of LHCM practices (Timur,2013).

The advances in technologies of information and communication and the improvements in LHCM have made the supply chain more important today. Through changing conditions of competition, it is nearly impossible for the enterprises to manage the health affairs for performing the interactions spontaneously within the supply chain. Mazzocato et al. evaluated the need and willingness for improving organizational performance, by creating alternative solutions and increased team communication (DeTreville,2006).

Radnor et al. identify three key aspects for the lean methodology to be introduced in a hospital: the evaluation of existing processes, the adoption of improvements in processes and the monitoring of performance of the improvements implemented (Mazzocata,2010). Supply system in health facilities determines the healthy stock management, regular supply of materials, speed and quality of maintenance and service process. It is possible to eliminate all activities, acts and processes that lead to waste that does not add value in the procurement process. Avoiding errors and increasing the efficiency of processes between the inputs and outputs of the hospital can be realized by simple practices in supply chain management. In a hospital, especially the emergency area, operating room, intensive care

and radiology department are the high-cost units, where important diagnostic approaches and treatment interventions should be applicated against the life threatening conditions. The most desired feature of all these units is the highest quality of service with lowest cost as fast as possible by a supported system of 7-24 open and ready continuously for every kind of health affaires. LHCM practices will probably affect the supply chain and opinion of employees during health services. In this respect, the realization of supply chain activities in a lean manner plays an important role in the success of LHCM principles.

The necessity of publications about LHCM practices and supply chain activities in health affaires are a subject of hard working with qualified professional efforts. On the other hand, the articles in literature provide limited data on the organizational structure and the effects of these lean activities performed by employees.

It was the first publication to address the issue of respect for people in the lean management perspective of Toyota in 1977 by Sugimori (Sugimori,1977). In this publication, it is reported that the efficient use and development of the capacity of employees are as important as preventing unnecessary work / waste. According to this idea, it is very important for lean practices to ensure that employees work safely, efficiently and improve themselves. According to Graban et al., the positive opinion of employees about lean management is almost 80-90% effective in the success of lean practices in health (Graban,2010).

Our study is the first to be the first to be a wide-ranging study of the practical results of lean management practices and supply chain activities that have come to the fore in the manufacturing sector, as well as the organizational structure of a large and functioning hospital, as well as the practical consequences of the level of impact on staff over a period of one year. In addition, since there is no standard scale that can test the effects of lean management practices, it is aimed to make the methods used as a guide for subsequent studies and to contribute to comparative evaluations of hospital

businesses. For these reasons, this thesis study will be the first to include extensive analyses after both the development of research methods and the implementation of lean management practices.

1.2. Purpose of the Thesis

The main purpose of this thesis is to determine the effects of lean management and supply chain (LMSC) activities on organizational structure using objective and repeatable methods. In the literature, it was found that there were very few scientific studies aimed at determining the effects of LMSC activities in the health sector on the physical and functional structure of the entire hospital organization (personnel perception). From this perspective, the results of the study will contribute to the expansion of this application by producing the information that will contribute to better management of personnel-related factors that have a central place in broadcast management applications, as well as to improve efficiency and quality in an important issue such as health care, contributing to the expansion of this practice, contributing to the implementation of methods aimed at reducing cost and waste.

In addition, since the methods applied in this research are objective and repeatable, it will provide guidance on monitoring the long-term effects of LMSC activities and developing tests to make cross-business comparisons.

1.3.The Problem and Importance of the Thesis

The most important treasure of countries is human beings, and the most important treasure of man is its health. Factors such as the increase in the world and our country's population, the increase in quality of life and the increase in average human life expectancy increase the growth rate of health care and the rate within the service sector (Vijg, 2017, Chen, 2018). Human rights and medical principles require that the diagnosis and treatment should be carried out by the most rapid and the best technical ways with suitable materials of excellent quality (Firth, 2014). Due to all these factors, the costs of health care are also increasing geometrially. Due to the limited budget

allocated to health care in all countries of the world, the issue of increasing productivity in time and cost issues always remains important. The budgets allocated to the health affaires should be managed wisely for saving time and cost during all kinds of procedures (Dugee,2019, Kochan, 2018). For all health care businesses without exception for these reasons; the least resource usage, the lowest cost, the production of faultless services and the way it is able to respond to health care with the least waste, fast, efficient and quality response is of great importance. At the same time, in order to monitor the implementation of this method for the process, it is necessary to develop the mechanisms to follow businesses.

For this purpose, for the first time in the 1950s, it was seen that the lean management practices applied in the automobile manufacturing sector yielded efficient results, and it was introduced that the implementation of these applications in the health service sector would reduce the time and costs spent in this sector, and increase resource efficiency, service quality and patient satisfaction (Kaplan,2008).Waring & Bishop say that management should emphasize creating value streams and reducing waste, leading to the reconfiguration of clinical practices to produce more productive and value-added processes (Waring,2010). Eliminating unnecessary steps in a process improves patient productivity and quality. To eliminate waste, process changes are required. The application of lean principles has created conditions that enable health professionals to perform their functions without wasting, but with increasing patient satisfaction (Nelson,2007). It was also reported by Doğan et al. in 2014 from Turkey (Dogan,2014).

The studies on the effects of lean management practices and supply chain activities in the health sector in a part of the hospital, a laboratory, a clinical unit, are very limited in responding to the generally intended expectations of these applications, but also reporting the positive effects on the organizational structure and employees, but also providing detailed research data on the structure of the organization. Furthermore, it was not investigated how the personnel who constituted the main unit of the organizational structure were affected by these applications in the published studies.

Today, supply chains are competing mainly in inter-business competition, and therefore supply chain management has become much more important, especially during this period of increasing globalization. In supply chain applications, the issue of lean management is new. The comparison methods of these applications should also be objective and repeatable. In this regard, our research is also an example for the work to be done later.

Two titles are important in LHSC applications; constantly improving and respecting people. While lhsc applications have been checked in the studies in the literature, the development in businesses has been checked, but its impact on the concept of respect for people (personnel) has not been investigated. Our study is also the first research on the impact of LHSC activities on personnel.

1.4 Sections of Thesis

The thesis consists of seven parts. In the first part, the introduction and methodology of the thesis is discussed. In the second part, the basic information on lean management, lean transformation, organizational culture, health services and supply chain management of hospitals, the method of the research on the principles of lean management practices in the health sector and the organizational structure of supply chain activities in the third part, and the findings in the fourth section are presented. The findings obtained in the fifth section were discussed. In the final section, results and recommendations were given and the work with the bibliography was completed.

1.5.Thesis Propositions

The recommendations developed within the scope of the research are as follows;

Proposition 1: The activities of lean management and supply chain in the health sector have an impact on the organizational structure of the Hospital

Proposition 2 : Lean management and supply chain activities in the health sector have a positive effect on reducing hospital costs and increasing productivity.

Proposition 3 : The health sector has a positive impact on supply chain operating performance of lean management and supply chain activities.

Proposition 4 : Lean management and supply chain activities in the health sector have a positive impact on hospital services.

Proposition 5 : Lean management and supply chain activities in the health sector have a positive impact on hospital staff.

CHAPTER 2

GENERAL INFORMATION

2.1. Lean Management

In recent years, where we have experienced a process of intense change with globalization, businesses have faced difficult and fast decisions despite the uncertain environment that has made their business most difficult to the competitive environment they face. Businesses must keep up with the constant change in the markets in order to maintain their assets. Companies that do not keep up with change will be putting themselves in danger in the short or medium term. Therefore, the imperative to keep up with this change is extremely important.

The change here is organizational change. The main reason for the change is the basis for maintaining the existence. Change in world markets, competition, political and cultural changes and changes around the organization require them to adapt directly to change by showing a quick reflex in their businesses.

The ability of businesses to show this reflex is directly related to the fact that the managers working within their bodies have vision and goals. The main idea of the success of the activities and its ability to show a good performance and to adapt to change is the continuation of the existence of the business.

In a world-long competitive environment with globalization, the lean management system is the most important topic as a means of change of organizations that want to keep up with the dynamic structure of our age. At the core of lean management practices is the increase in performance efficiency and the elimination of all operational materials and workforce that do not create added value. In lean management practices aimed at continuous development with eliminating waste, it has been observed that until recently, this philosophy applied only in the manufacturing sector has now beapplied in the health sector, which constitutes the most difficult leg of the service sector. Since the main goal of the service sector is to increase profitability, the most important topic is to increase the quality of service and eliminate waste, and to eliminate activities that do not produce value more frankly.

Lean management; It is a production philosophy that tries to minimize the deprecation of activity and the amount of resources it uses, which does not create value in the time from the supply processes of the product to the customer.

Lean management approach; it aims to be sensitive about environmental sensitivity at the same time as eliminating waste that may occur in all of its activities. It also aims to establish an excellent business system. In order to establish an excellent system, all units of the business must perform their operations with common dedication and participation. In this sense, total quality management and process improvement for businesses are actually inseparable two parts (Şenel, 2004).

Lean manufacturing system is a system that uses all production factors flexibly, if possible, with zero waste and with minimal resources, at least as soon as possible, at least cost and faultless production to meet customer requests and expectations (Tekin, 2012).

In the philosophy of lean management, value-added activities, compulsory but added worthless activities and value-added worthless activities (waste) can be classified in the activities of the business (Chiarini, 2013).

Lean management; It is a type of management that is "systematically committed by the transfer of authority among employees, where employees are held responsible for their work within their duties and powers, the hierarchy is minimized and the responsibilities are shared and the hierarchy is targeted and established for the realization of lean production". An intellectual approach consists of lean management, meanings and methods (Warnecke,1995).

Toyota has developed the least inputs to ensure the most output, and than this approach has been implemented in the automotive sector. Although Toyota has a thought and problem-solving approach specific to the manufacturing system, Turkey has gone beyond what is expected of the automotive manufacturing sector and in other sectors over time, both in terms of its geographical strategic position and with the advantage of workforce paper, with engineers and managers at all levels.

Canceling all transaction steps that do not express value to the customers of enterprises and are unnecessary, ensuring continuous improvement in all functions by being in the activities of employees in integrity, being at the base of the culture of forwarding with this improvement, and the fact that they are constantly aiming for better, constitutes elements of stark management.

Perfection to continue forever is the basic principle of lean thinking. Despite the variety of customer's wishes and desires, it differs from the way it is produced by eliminating waste in seven ways and being able to produce with minimal stock, to ensure product diversity, to provide views of qualified and skilled employees in all functions in a holistic way. There are many differences between collective production style and lean production approach.

The following table 2.1 shows the operational and administrative differences between classical production and lean production.

CONVENTIONAL (TRADITIONAL) PRODUCTION	**LEAN PRODUCTION**
Standardized products	Flexibility capasity in product diversification
Production with acceptable error rate that customer wants	Production with zero error, at the amount and time the customer wants
Stocked production	Out-of-stock production
Demand forecast-oriented planning	Planning by customer order
Production cycle time lasting weeks / months	Production cycle time lasting hours / days
Economies of scale-large-scale machines	Opportunity economy/ purpose-built machines
Low cost and output focus approach	Elimination of waste and in-process control
Sampling method in quality controls	100% self-control method in quality controls
Sampling quality control	100% control at the production point
Functional placement	Cell type, placement by product flow
One man for each machine in general	A man looking at several machines
Less contribution from customers in design	Great contribution from customers in design

Observer administrator	Management with the participation of all employees
Unskilled worker	Skilled worker
Vertical integration	Backward supplier development
Low level of authorization	Full level of authorization
Recommendations only from the authorities	Recommendations open to the entire organization
Report-based information by managers	Visual and transparent information involving all personnel
Objectives are known only to the administration	Objectives and objectives are owned by all employees
Detailed work section	Teamwork and skilled personnel
Leadership provided by pressure	Broad leadership
Hard-to-control fixed and high costs	Reduced costs with under-control improvement

Table 2.1. Comparison of Classical Production and Lean Production (Zoroglu, Barış, 2013)

The principles of lean thinking and lean production have started to make a lot of mention in the health sector, both in private and in public, in recent times. Lean management is an understanding that focuses on the restructuring of organizational activities in order to regularly reduce or eliminate unnecessary waste in enterprises during the activity process.

Lean management is an understanding that focuses on the restructuring of organizational processes to continuously reduce and eliminate waste in companies and organizations over time.

Lean Management aims to transform and develop a company so it can keep pace with change. Because customer satisfaction and financial results are

indicative of success for the company, businesses strive to constantly renew and improve themselves with their employees.

The most important unison in the transformation of a company is the human factor. As an example of teamwork, employees are led by leaders/managers and one day they become leaders. Leaders please the customer and grow the company with their teams. In this respect, the most important element of lean management when the subject is evaluated is human-oriented.

To emphasize the importance of being human-oriented; "Lean management without supporting employees is more prone to negative consequences"; it has been stated that all stakeholders and managers should receive financial support in order to reach the standards of living that employees desire (Anonymous,1996).

Leaders must improve their teams and improve their employee processes. Corporate culture should turn into this framework; the leaders determine the culture. Leaders are extremely important for lean management to demonstrate a "lean management approach" focused on process and outcome, using these five.

Lean product development requires approaching these intertwined pastures as an element of the whole system (Karlsson,1996). Lean management; is a business system for the organization of the most output with minimal input for maximum efficiency and satisfaction to meet the expectations of all customers requesting services (Chet,2007). Today, with lean management practice, companies that prioritize three factors such as work, price and quality can continue their activities (Cooper,1996).

2.1.1. Historical Development of Lean Management

The book (The Machine That Changed the World", which was first published in 1990 and translated into Turkish as the "The Machine That Changed the World", was first republished in English in 2007, 17 years later, and was first

mentioned in the book "The Machine That Changed the World". For the terms "Lean" and "Lean production", compiled into the literature by John Krafchik, a researcher at the Massachusetts Institute of Technology, Krafchik used the word lean, which means bufferless production for this new production paradigm.

When this book entered its publishing life, it was almost half the size of Toyota, Ford and General Motors and production capacity and brand value. With lean management practices, we can say that Toyota has easily passed Ford today and is currently on track to become a successful industrial enterprise to pass General Motors and to demonstrate the world's rapid change and to ensure continuity with its environmental and continuous adaptation to change.

However, the variety of models introduced by General Motor Alfred Sloan was in greater demand than Ford's black uniform car. This is exactly the period when consumer habits changed and demand began to be taken into account. This is the 2nd time this term. It lasted until the start of World War II. While the same Toyota continues its activities as a manufacturer of old textile machinery; he was preparing to enter the automotive sector with the prototypes he produced. After the end of World War II, Japanese manufacturers implemented the Toyota production system to achieve U.S. production efficiency. In the 1950s, Toyota officials TaiichiOhno and EjiToyoda traveled to America to visit the Henry Ford-owned auto factory in Detroit, N.M., and decided that this production model could not be implemented at Toyota because of the elements that do not create value in the mass production system that Ford uses and are aimed at a lot of waste. After World War II, Japanese manufacturers developed this system to capture u.S. efficiency with the Toyota production system.

Toyota officials TaiichiOhno and EjiToyoda traveled to the United States in the 1950s, visited Henry Ford's auto factory in Detroit, Detroit, and decided that Toyota's production model could not be implemented because of elements that did not create value in the mass production system used by

Ford and were too waste-oriented. Japanese carmaker Toyota has established the Toyota Production System as a new production system, taking into account the waste of mass production. This is how the historical development of the so-called lean production system was formed in this way (Womack,1990).

TaiichiOhno and EjiToyoda are the most important factor they have identified during their visit to the Ford Factory, with weak flexibility and waste that does not produce value as the mass production system is based on a strict hierarchy. According to TaiichiOhno and EjiToyoda, the key elements of the Toyota production system are as follows (Türkan,2010):

 There is no waste in the Toyota production system.

 In the Toyota production system, unstocked and Pick-based production is essential. When this is achieved, production occurs just in time.

 Toyota production system has a mutually beneficial relationship with suppliers. Flexibility in the Toyota production system covers both the product-based and the entire production process.

 Maintaining quality and continuous improvement in toyota production system constitutes the most important purpose of production.

 Toyota production system is based primarily on a production model with fewer intermediate managers based on human beings.

 In the Toyota production system, communication channels are always kept open and all personnel are encouraged to participate in all processes of production.

 Toyota production system has teamwork with discipline-based versatile employees.

Many automotive manufacturers in the automotive industry began to releassign the applications related to Total Quality and Total Efficiency that

they taught the Japanese with their methods due to the interest of the book "The Machine That Changed the World" in their time. In addition, many companies have started to make the productivity and efficiency models put forward by toyota production system in accordance with them under the name of Just In Time Production Systems.

If we evaluate lean management in a set, we can evaluate "Total Productive Maintenance", "Total Quality Management" , "Full-Time Production" (Just-in-time), "Supportive Human Resource Management" and "Employee Strengthening" and "Teamwork" in this set (Emiroğlu,2016).

2.1.2. Basic Principles of Lean Management

Lean; it uses some analytical tools and techniques to allow efficiency and value to penetrate all areas of the company.

Describes the principles of implementation and the way lean production is applied; In the study titled "Lean Principles and Practices", the five basic principles of lean production are listed as follows (Bergstrom,1995, Womack,1996)):

1-) Value

2-) Value flow

3-) Continuous flow

4-) Tensile

5-) Perfection

 Value: Here is the 'value' from the Customer's point of view. It is about meeting the customer's expectations in order for a service to be valuable. The value depends on the identification of customer needs and the value may not always be produced by eliminating waste. In this respect, the customer should focus on what the value means. In enterprises, activities

that add value to the perfect production of the product should be determined (Carreıra,2005).

Since the customer is ready to pay for it, meet its needs at a certain price and has certain characteristics as a certain product and/or service, every product and/or service that does not meet the customer's wishes is defined as a waste at the basis of lean thinking. If we define the health institution as a system, "Value" for Lean management, which aims to eliminate all waste in the system, is focused solely on customer-oriented and fully met the need.

In Table 2.2 below, activities that add value and do not add value in health institutions are shown on a unit and duty basis.

Unit	Task	Value Adding Activities	Activities That Do Not Add Value
Operation	surgeon	Surgery of the patient	Waiting for pre-operative procedures
Pharmacy	Pharmacist	Drug studies	Medications reintroduced from patient units
Inpatient	Nurse	Management of patient medications	Copying information from the computer or other systems
Radiology	Radiology technician	MR imaging process	Unnecessary shooting
Lab	Laborant	Obtaining test results	Detecting defective kits

Table 2.2. Activities that Add Value and Non-Add In Health Institutions (Graban, 2009)

 Value Flow: The 'value flow' must be defined for each product/service. The value flow must cover all processes from the beginning of production to the final process of the product or service. Accordingly, activities that do not

give the value the customer expects are only wasted. Therefore, the value flow determines how to apply value elements.

Value Flow Mapping (VFM) is one of the techniques used to model value flows. VFM is a mapping technique used to model the flow of materials and information in a supply chain (Rother,1999).

All activities within the system are divided into three as;

Mandatory Wastes,

Value-Generating,

Non-Value (Waste-muda) Creator.

Value flow mapping does not just setup the material flow. It also considers transaction times for activities, machine distortion times according to technical maintenance, inventory records and recurrent operations (Tapping,2002).

The main objective of the creation of the value flow map is to prevent waste and unnecessary activities by evaluating the whole process from a bird's eye view and full evaluation, rather than focusing on the operating topics or elements individually (Abdulmalek,2007).

After the definitions that occur when business activities are analyzed as a whole, it is necessary to eliminate activities that do not create value, to be cancelled as much as possible from mandatory waste, to be minimized as much as possible, and to increase the rate of value-generating activities to all activities within the system. Value Flow Mapping(DAH) refers to this comprehensive analysis and reinterpretation of the process of putting forward a product and/or service.

 Continuous Flow: Eliminating waste is standardizing processes in the value stream and making them work smoothly. The value flow needs to be maintained.

It is necessary to ensure that these steps, which create value after the rate of value-creating activities within the system, are systematically realized, and that the value becomes continuous. The faster the initial products or services that are called inputs become a service that produces value, the higher the "flow" speed of that system.

 Pick: When the continuous flow of value flow is eliminated, the customer's needs and desires must be allowed to direct production. This means looking back at previous processes and backwards to produce the product or service that the customer wishes, starting with the customer at customer request, and to see what needs to be done to meet this demand.

For the flow of the value to function healthily, it is necessary to control the flow rate. Control of process speed is achieved by wasting operating activities and ensuring that unnecessary transactions are minimal or zero. Since our goal is to put forward a service that meets the needs of the customer and meets its expectations, each process should be considered as an internal customer, and each process should be considered as an internal customer. Thus, each process will be focused on producing the highest value by controlling each other and "pulling" each other.

 Excellence: It is necessary to keep track of the continuous improvement of the value chain. The amount of time, time and information needed to deliver a quality-oriented service to the customer should always be reduced by removing value-based activities from the value flow.

Better than always, there is always a goal of excellence by acting with philosophy. After the value is defined, it is a real dedication and serious analysis to realize the continuous flow of this value and to provide it within

the system where the customer draws value and their wishes are fully met. This serious analysis is the character of lean management.

2.1.3. Application Techniques of Lean Management

When the application techniques of lean management are examined in health care, the six most important topics come to the fore. The scope of my thesis is as the 6 topics that come across as the most commonly used techniques in reputational health services;

1-) 5S,
2-) Kaizen,
3-) Six Sigma Approach,
4-) Process Management,
5-) Total Quality Method (TQM)
6-) Value Flow Mapping(VFM) method will be evaluated as such applications.

2.1.3.1. Organization of The Workplace - 5S

5S (Seiri, Seıso, Seiton, Seiketsu ve Shitsuke), which are translated into our language as sorting, editing, cleaning, standardization (continuity) and discipline, respectively, can be applied (Liker,2008).

The "5S" approach in the complexity of providing health care produces the work done in a well-organized health institution centered on patients and safety. It prevents any time and materials that are wasted, making them more efficient and serving on time. In addition, the "5S" approach is based on raising the interest of employees and improving a sense of involvemnt.

5S consists of words that begin with the letter S. Looking at the targets of 5S; improving health and safety, increasing employee participation and related, increasing quality, increasing morale, increasing productivity, while reducing cost and cycle times. 5S saves zero with the highest operating performance minimized cost and again with the highest operating perk, zero work safety with increased occupational safety with all risks, zero breakdown with regular

and routine technical maintenance, zero waste or pert service with higher quality, zero adjustment time with greater product diversity, zero adjustment time with greater product diversity, zero complaint sits with greater confidence, and a ever-growing business where all employees and customers have more respect and confidence (Liker),2004.

The "5S" approach is actually based on very simple and effective rules, cleaning and order principles. The fact that the 5S approach works in an organization can be considered as the passing of the first step in the continuous quality development process. After 5S applications, Kaizen and then total quality management are reached.

As can be seen in Figure 2.1, lean management implications supporting the patient satisfaction target are shown in patient health services. 5s, Kaizen and total quality management are cited as important headaches for increasing patient semen and sustainability.

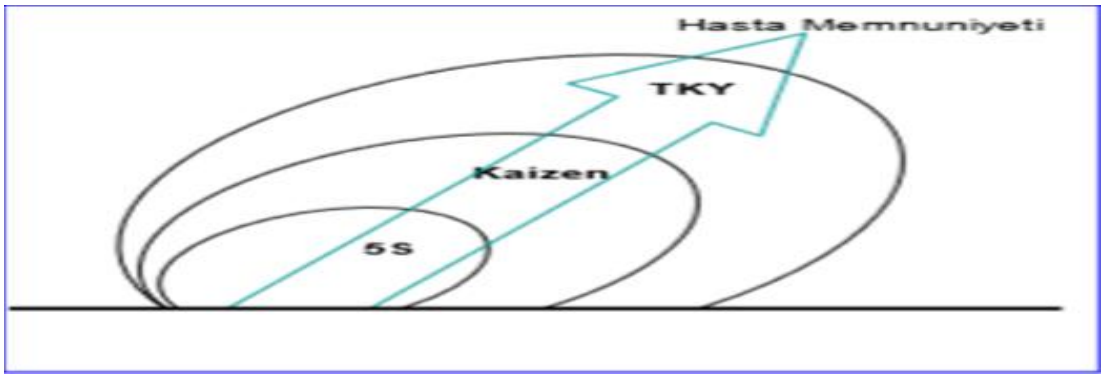


Figure 2.1. Development of Patient Satisfaction

The topics that make up the 5S application are:

Japanese	*English*	*Turkish*
Seiri	*Clearing-up*	*Sınıflandırma*
Seiton	*Organizing*	*Düzenleme*
Seiso	*Cleaning*	*Temizleme*
Seiketsu	*Standardizing*	*Standartlaşma*
Shitsuke	*Discipline*	*Disiplin*

Clearing-up (Seiri)

In the "classification" phase that constitutes the first "S", the work will be started by identifying meteryals that are actively unused and unneeded in their fields of activity. All stakeholders in the field of activity, how much time to use how much time to use from which product by classifying them in a record process continues. This is an extraction process. It's about getting rid of all unnecessary inert materials and equipment by determining what's needed and what's not.

- Here you will be looking for answers to the following questions;
- Is there any unnecessary item in your work field that creates a mess?
- Is there any material or equipment on the floor that's dangerous?
- Are there unnecessary materials such as cables and pipes left as they are?
- Are all hand tools, equipment, measuring instruments, materials and documents classified and placed in their place?
- Are these classified products labeled?

Tagging is the most important process of the first step.

Red Label Application Stages;

- Initial, Launch red label campaign
- Determination of objects to hang the Red Label
- Red Label hanging standards
- Preparation of Red Label
- Attaching Red Labelson

- The installation of red tags deciding what to do to the red labeled object.

When making these operations, it is important that all the staff are there when making these operations. The same material or equipment may not be used more or less in any other company while each of its businesses is used extensively in one company because the dynamics in itself are different. In this respect, this stage requires the separate process of each business's unique listing classification.

Edit (Seiton)

After the first phase of the extraction and ethics process, the second step is the arrangements made to find and use the materials or equipment that we have decided to keep when needed.

There should be such a layout in the business that it is intended to easily access what we need, and it is recommended that the layout be done again with the participation of all personnel. In the first step, everything needs to be clean. Please do not address. For this purpose, business areas should be divided into sections, lettering or numbering, and they should be able to see all of them with large labels.

After addressing step, all workspaces should be painted in accordance with the psychology of the study. Rest areas should be set in the simplest way.

Figure 2.2 also suggests color that can be distinguished by comfortable light in the briir for addressing. In terms of positive evaluation of the workspaces, green, corridors orange, religious areas blue and gray color addressing for stock areas are recommended.

AREA	COLOR
Fields of Practice	GREEN
Corridors	ORANGE
Resting Areas	BLUE
Stock Areas	GRAY

Figure 2.2. Color Suggestions for Addressing

Then comes the determination of the boundary lines. Workspaces and special areas must be divided into clear shapes from each other. Yellow color is often used for these boundary lines.

As cartooning titles;
Determination of border lines
Entry-exit lines
Determination of door opening lines
Drawing inventory zones
Drawing Traffic Flow Lines
Drawing Dangerous areas (Tiger Pattern)

Marking sits in all fields after setting boundaries. These markings must be large and legible. The naming processes and areas where the machines are shown on the collars of the employees, as well as the shelf and addressing in the areas of stocking, should be included in the evaluation in this category.

As seen in Figure 2.1. after defining borders, markings must be done in all areas. These markings must be big and readable. Areas and directions where naming processes and machines are shown on employees' collars, as well as shelf and addressing in stocking areas should be included in this category.

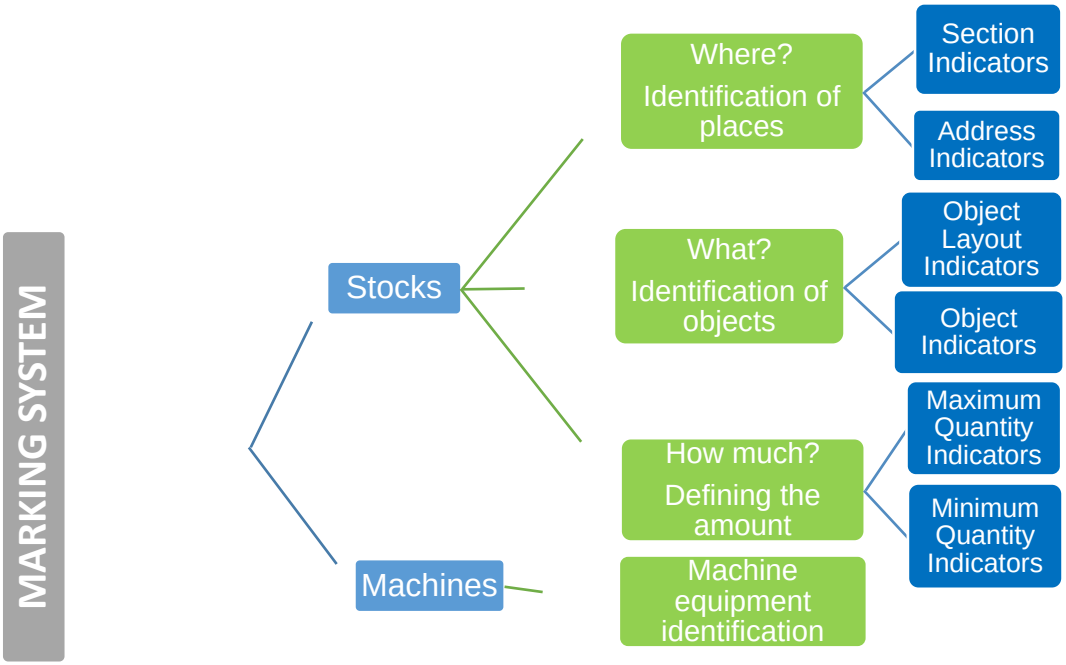


Figure 2.3. Marking System

Clear (Seiso)

Indicates the third "S" cleanliness. The third of the 5S steps, the seiso, always means cleaning everything as it is ready for inspection.

In the first stage, it is determined what to clean, then who cleans, how to clean it, which equipment to clean. And the required cleaning process takes place.

Standardized (Seiketsu)

The fourth S of 5S is the next step after the first 3 S stages have been implemented. To standardize good practices. Standardization is the creation of all procedures documentation and checklists. All documentation and

procedures in question should be easily accessible to anyone responsible. When this is done, it is anticipated that workflows will become much more effective.

Disciplined (Shitsuke)

The fifth "S" calls for the protection of all benefits from the previous four "S" to become permanent. Ensuring discipline is part of the practice to ensure the continuation of the movement. This is the creation of a permanent habit in ensuring the continuity of the right processes in the last step. The aim is to ensure the protection of the right procedures. A healthy workplace is a place where constructive criticism is welcomed.

Constructive criticism and acceptance are the basis for discipline. As a result of 5S application in the workplace, accidents are reduced and eliminated. Increasing productivity depends on the success of 5S applications to prevent time losses, reduce faults, diagnose problems earlier, increase compliance among employees and prevent waste.

2.1.3.2.Kaizen

Kaizen consists of words in Japanese that mean kai change and zen better, and means continuous improvement with the shortest definition. Its primary purpose is to make the process in production better with small but effective changes. It is a method that prioritizes processes so that results can be better. Kaizen is applicable not only in business life but in all stages of life. In this respect, it is a way of life that is excavating.

Kaizen is very different from the western approaches that are result-oriented because of the process-oriented. Under this difference, kaizen businesses fed from japanese lifestyle satisfies the recommendation of improving the business activities of the entire team from the top house to the bottom, and aims to innovate over time.

Kaizen, which represents development in all directions, targets excellence with continuous development. however, since every point reached is always better, it argues that perfection is not the end (Karakaya,2004).

Kaizen is also not the perfect point at all. And he has a structure that never accepts the existence (Cetinay,2016).

The aim of Kaizen philosophy is to perform faultless production, minimize activities that do not add value, make processes simple and reach targeted land with budgeted or projected expenses (Acar,2005).

Table 2. 3 discusses the differences between innovation and cash. While it is deemed sufficient for a limited number of employees to participate in the implementations in innovation applications, it is important that all personnel are included in the process in the Kaizen application. While high costs must be endured for innovation, it is possible to come to conclusions with small investments.

Innovation	**Kaizen**
Short-term	Long-term
Requires big steps.	Small steps need to be taken patiently.
Is applied with a limited number of people.	All personnel are involved in the process.
Technologyis at the forefront.	Human is in the foreground.
Requires big investment.	Requires small investment in addition to existing facilities.
Requires new staff hiring.	Is applied with existing staff.
Requires new financial resources.	Available resources are sufficient.

Table 2.3. Differences between Kaizen and Innovation

In order to successfully implement the philosophy of Kaizen, all stakeholders in the business must believe in this philosophy and be ready. Adoption of philosophy is extremely important to prevent problems (Macpherson, 2015).

The way kaizen philosophy works at all levels of the enterprise is shown in Table 2. 4 with the title of How Kaizen philosophy works at all levels of business (Imai 1996).

Senior Management	**Mid-level Management and Personal**	**Supervisors**	**Workers**
Is determined to start Kaizen as a company strategy.	Kaizen spreads and executes its goals through inter-functional activities determined by the management.	Uses Kaizen in functional roles.	It participates in Kaizen with its suggestion system and small group activities.
Provides support and direction to Kaizen by providing resources.	Uses Kaizen in functional activities.	He prepares plans for kaizen and guides the workers.	It fits the discipline in the workplace.
Creates policy and cross-functional goals for Kaizen.	It sets, maintains and improves standards.	It strengthens communication with employees and provides high morale.	It improves itself to solve problems better.
Carries out policy dissemination and audits to achieve Kaizen goals.	It instills Kaizen awareness in employees with training programs.	It supports small group work and individual recommendation systems such as quality circles.	It develops skills and experience with cross training activities.

Establishes systems, processes and structures for Kaizen.	Helps employees develop skills and problem-solving tools	Provides discipline in the workplace.	
		Kaizen creates suggestions.	

Table 2.4. How Kaizen philosophy works at All Levels of Business (Imai 1996)

At the beginning of the basic activities of Kaizen application is to move away from traditional ideas. It should focus on how to do the job away from excuses. Excellence should be sought in the short term, not in the long term. And all employees should be involved and acted with common sense.

2.1.3.3. Total Quality Management (TQM)

Quality derives the concept from the word "qualitas" and has passed it into our language in Latin. Stadlartlaa means harmony. It is also expressed as a quality harmony. (Erdogan,2008)

Total quality management, the aim is to determine customer satisfaction at the highest level and to ensure control by determining the processes in which all employees are responsible in order to ensure compliance with these standards. It is the management of the management where control of standards is constantly controlled and simultaneously continuous development is targeted (Flattening, 2012).

The priority is given to people, teamwork is adopted, customer-oriented, in the light of statistical data, the necessity of continuous development and improvement, the total quality process in which managers lead the processes together with teamwork must be determined first (Karcıoğlu,2001).

In total quality management, non-operating resources have a high impact on sustainability. The current error rates in production, the high amount of products without errors and the full meeting of customer expectations are the most important topics in total quality management (Hacirüstemoğlu, 2002).

The biggest impact of the studies carried out in the health sector for total quality management results as a positive effect on patient and physician performance. The effect of information of different importance in the competitive environment, the physical conditions of the service area, the operation, transportation, the understanding of fast service is very great. Measuring these effects is very important for quality of service management in health.

When we think that the patients who purchased the service do not have theoretical knowledge in detail of the service they receive, the cleaning of these patients in the environments where the service is taken, the interest of the personnel, the attitude and movements they face when they receive services, the speed of the service and the speed of the bureaucratic functioning are also fully met the expectation of the inspection times, the noise level and visual quality of the service provider are on the way to evaluate the quality of the service provider.

Health care quality health conditions to prevent improvement or deterioration of the other way to prevent preventive services determines all activities. The result of quality service in the health sector is much higher than in all other sectors. The provision of quality health care is much more difficult than ensuring the quality understanding in the production sector. In this respect, the importance of total quality perception in health institutions is much more important than in other sectors.

The success of total quality management in health institutions depends on the fact that the senior managers in the decision-making authority of the hospital's service unit are participating in all the land received, open to innovation, risk-taking, brave and decisive (Özer,2006).

In health care provider institutions, all decision-making personnel should pay attention to the thoughts of all the staff working for them and make them feel that they care about their ideas. Meetings where staff can express their views and the flow of horizontal and vertical information should be fully ensured. In

addition, participation in decision-making processes should be ensured in the patients who are serving. At this point, organizations should be organized, mails, satisfaction and complaints should be placed in the tables where they are communicated, surveys should be conducted, boxes and criticisms that come through press release or media should be included in the decision-making mechanism taken for the management process in patients in the position of their customers in health care providers (Çakmakkaya, 2013).

Total quality management process management, rapid determination and elimination of problems in the pool of information for quality, and all activities for this need to be standardized at the same time by getting rid of all fire and unnecessary procedures for patient expectations (Ustasüleyman,2011).

Unlike classic QM logic, TQM controls should be integrated in an integrated way for the whole process, not for certain businessfish. Thus, a result that produces the most value both throughout the whole process and within our entire chain of activity (Çankır,2010).

As can be seen in the Table 2.5. titled Differences in Total Quality Management and traditional management approach; there are differences in responsibility, leadership, profession, land, expectation, planning, problem solving, auditing and quality understandings between traditional management agreement and total quality management are shown.

Traditional Management Approach		**Total quality Management**
Individual responsibility	Responsibility	Joint responsibility
Professional leadership	Leadership	Managerial leadership
Autonomy	Profession	Responsibility
Managerial authority	Decision	Participation
Professional authority	Decision	Participation

Expectations for purpose	Expectation	Performance and process expectations
Strict planning	Planning	Flexible planning
Examination of complaints	Solve problem	Getting an example
Retrospective success evaluation	Audit	Continuous success evaluation
Quality assurance	Quality	Continuous improvement

Table 2.5. Differences Between TQM and Traditional Management Approach

2.1.3.4. Value Flow Mapping (VFM)

The value flow mapping method, developed by Rother and Shook, is one of the most important topics among lean management applications. It is widely used. In the value flow mapping method, activities that create and create value in all processes from beginning to end of activities are identified. The method is to map all processes from raw material to the delivery of the product to the final customer at the beginning of the work.

It detects all activities that create value or create value. The targeted subject is to close the cycle periods of the transactions to the target period at the beginning of the process (Yurdugül,2010). There are many studies done when scanning literature for the value flow mapping method.

When the literature for the value flow mapping (VFM) method is scanned, it is seen that there are many studies. Some examples of these studies can be seen in Table 2.6

Year	Author	Country	Method	Benefits of Study
2007	Abdulmalek and Rajgopal	USA	Current and future situation DAH simulation study	Reduced lead time low inventory level
2007	Lian and Landeghem	Belgium	Current and future state DAH	Procurement time is from 1.810 seconds, to 1.479 seconds. It decreased to 1.116 seconds and 973 seconds
2008	Herron and Hicks	England	Productivity and business needs analysis, training needs analysis	It has increased the performance in the production establishments.
2008	Walley and Radnor	England	DAH and other lean manufacturing studies in the public sector	Procurement time has been reduced by 48% and the number of work steps by 78%.
2009	Solding and Gullender	Sweden	Current and future situation DAH simulation study	Performance has been increased.
2010	Chen and diğerleri	USA	Lean manufacturing, 5N, Kaizen and DAH studies	Increase in product quality,

				shorter work times
2012	Kodua and diğerleri	England	DAH and modeling methods	Performance has been increased.
2012	Ar and Ashraf	Malaysia	Current situation DAH The future situation DAH	It has created waste by increasing productivity.
2012	Bo and Mingyao	China	Current situation DAH The future situation	Cycle time From 106 to 21.9 min; procurement period decreased from 67 to 16 days.
2014	Schmidtke and diğerleri	Germany	Simulation model developed from DAH method	The procurement period has been reduced from 11.4 days to 1.4 days.
2015	Simon and diğerleri	Brazil	DAH and simulation methods	While the piece produced was 2,137 pieces / day, 4,274 pieces were obtained with the 1st Scenario and 4,079 pieces with the 2nd Scenario.

2016	Murugesan and diğerleri	India	DAH method	Procurement time and inventory level are reduced.

Table 2.6. Some Studies on VFM around the world (Ömürgönülsen,2018)

There are also some challenges faced in practice by the VFM method. Since the method is a visual mapping method, it is very difficult to map institutions that produce goods or services with complex production processes. Because in mapping, a series of mappings are evaluated as a whole from beginning to end.

Value flow mapping All product and service processes for the patient's needs in health institutions are considered as a whole. The flow map is a picture of everything that needs to be done for the product the customer needs (Kaplan,2008).

Value flow mapping (VFM) shows how a product that is included in the process as raw material flows through the system until it becomes the final product. Organizes all the information flow required. In this respect, it is important to determine the elements such as time space quantity in all sub-digits of the goods or services to be produced. In each process, it is necessary to provide waiting times and information flow in all aspects of how long the work takes.

Value flow mapping offers the opportunity to establish a link between material and information flow and evaluate the whole process as a whole. Value flow mapping allows you to look holistic as long as it is all (Pine,2011).

As long as the value flow mapping, all the steps necessary to make the service happen with a holistic approach can be clearly visible.

In mapping the value flow, each step of the process is characterized by the way the value is produced. When the subject is evaluated accordingly, the process is evaluated in 3 operations headings (Güzel,2011).

Actions that do not add value: are defined as actions that are considered to be purely waste and must be eliminated.

Required But Non-Value Actions: defined as actions that are partial waste but are necessary for the production of goods or services.

Value-Generating Actions: Defined as actions that are not wasted for material or service production and generate value.

In healthcare processes, value flow mapping has serious advantages in the sund health service processes that value flow mapping offers. If these benefits are to be sorted; (Akcaoglu,2012)

 It contributes to better visibility of waste from the formation of health care from start to finish.

 Contributes to the common language use of all stakeholders during the health care process.

 Since the map is obvious, it allows discussion of distressed situations.

 Contributes to the success of all functions with lean applications.

 Organizes the entire flow between information and material flow.

 VFM techniques help identify waste in the value flow and therefore find the most appropriate means of transport or reduce this waste.

In order to use the value flow mapping technique, there are steps to follow in order (Özhazelnut,2011).

Product Family Selection: A family of products refers to the identification of sickle product families used in other similar activities. group classification of products considered common equipment in similar process steps.

Current Status Map: The ultimate goal in creating a status map is the process of detecting the flowchart in the eyes of customers of the current functioning.

The current status map is very useful in detecting the various waste resources that cause the flow to be blocked and in non-value-added actions. The way to create the map is to collect the necessary data and information by walking in the stream and discussing what people do.

Future Status Map: After the current dummas map is removed, it is determined by the senior administration and revealed where you want to go, adopted by all stakeholders. So the future status map is not how things work; ideally mapping how they work and the path in which you design a value flow.

Business Plan and Application: an activity plan is being prepared with the upcoming status map in the final stage of value flow mapping. In this mapping, the activity managers are determined and connected to a specific calendar in the timeflow of the plan. All mapping process should be digitized and compared to plan. When needed, revision is required.

The value flow mapping technique uses a large number of visual cues and symbols to show both the current situation and the future situation in a way that everyone understands. It eliminates jobs that do not express value in the customer's access to the service and contributes to the uninterrupted processing of the flow (Efe,2011).

2.2. Lean Transformation

The biggest difference between the classic approach and toyata culture is that managers control whether people work hard in the classical approach, while the Toyota approach changes the perspective of activities, solving problems by improving processes and working towards a common goal (Rother,2010).

In today's market conditions, where there is intense competition, there are a large number of variable factors, making their conditions increasingly difficult. In order to prevent this, it is very important to be able to develop business strategies themselves and to gain mobility that can react instantly to the

changes in the markets. This can be achieved by establishing organizations that can provide production or services in a flexible structure. Businesses have to give themselves the functions that can adapt to change their business processes and technologies in order to succeed in new conditions. We can express this statement of gain as a transformation in the plain.

Lean transformation architects are all employees, especially managers. They are highly developed, which are the head of the employees, and are seen as key to providing energy to the organization, active coaching and ensuring the growth of Toyota culture. In lean leadership, leaders support team members in all the topics they need. These support topics will be provided to support long-term trainings and continuous development in business strategy (Zoroglu, 2013).

The real expectation of customers is that businesses must see and apply very well what they need to improve and how to improve in the face of the fact that their customers are asking for cost reductions under the name of "continuous improvement" from their production (Ipbuken,2010).

For the success of lean transformation projects, the roadmap to be followed must be created correctly. When the lean transformation phase is evaluated;

For the success of lean conversion projects, it is necessary to create the roadmap to be followed correctly. When lean transformation is evaluated in stages, it is possible to evaluate lean transformation in 4 stages as seen in Figure 2. 4. These stages are listed as lean manufacturing, lean operation, cultural change and lean value chain.

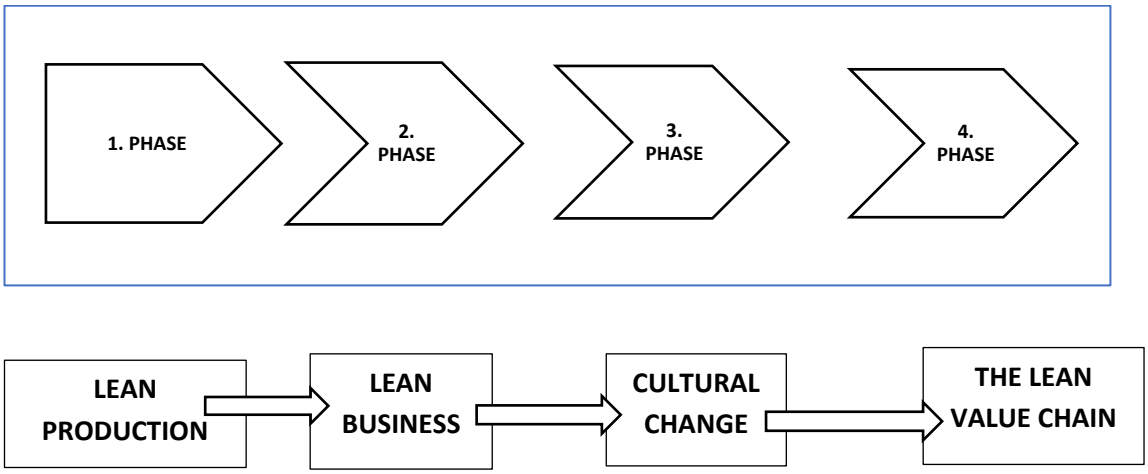


Figure 2.4. Stages of Lean Transformation

The first step of lean transformation almundisis is determined. Employees are given trainings towards this moment. Value flow mapping is done.

In the second step, the management and organizational format of the business is emased. Team work is focused and efforts are made to improve the process. At this stage, various lean tools such as Kaizen, 5S, SMED, Total Efficient Maintenance and problem determination and solving techniques of total quality management are used.

In step 3, the continuity of information gained in the first two steps and process developments is aimed. In the last step, the mansion is expected to be adopted by everyone and the mansion is molded in business culture and staff culture.

Before lean transformation	**After lean transformation**
Sufficient quality production	Approaching zero error
Production halt	Don't let the error happen again
Production as you want	Production up to customer demands
Stocked production	Just in time production
Reduce variation	At the same time eliminate waste

Study regularly	Work in accordance with the 5S system
Work periodically	Monitoring instant performance
Take measures if necessary	Don't let the error occur
The solution of problems is long	Exploring the Kaizen way of thinking
Blue-collar employees are supportive	Blue collar employees executive

Table 2.7. Before and after a simple transformation in a business (January 2010)

2.3. Organizational Culture

Organizational culture; shared beliefs, values, norms are used as a tool to maintain the existence and success of the company. Culture is a whole of values shared with what is experienced within the company, the behaviors learned and earned. In general, the expression of culture is examined with topics such as personal culture, organizational culture and social culture, but it has the same general meaning. The organization that makes up our subject is the sum of the culture, business culture or company culture.

In the world, trade boundaries are lifted and globalization, as well as change in the cultures of the organization is imperative. Although this change is called change for many forwards, it requires such a serious overhaul for some businesses that are considered transformation. Concepts called "transformation" in terms of change, compliance with change, or even radical changes are the result of constant change. The inability to achieve this adaptation directly affects the continuity and sustainability of companies.

2.3.1 Organizational Change

We can consider organizational change as revisions made by enterprises in order to respond to changes in demands in their internal and external circles. We can consider the revisions made by businesses in order to respond to the demands for change in their internal and external circles as organizational change. The change may mean a change in any technology or a change in the business process.

The organizational structure of businesses can also be shaped by a change in any part of it. For example, if you want to A technological change, or even one of the decision-making mechanisms, can lead to organizational change. Organizational change can happen in both directions. Change can happen positively or negatively. Organizational change can be caused by the internal or external circles of businesses.

The culture of the organization is certainly influenced by the normative structures and environmental factors in society. Economic, political developments, natural resources, climate change are among the factors of change attached to the external environment of the Organization. Organizational structures are open systems that will be immediately affected by external changes. The organizational structure has the flexibility to direct the external developments. Managing the environment can be considered as important as running an organization. A change in the external part of the organization is vital.

2.4. Health Services And Organizational Structures of Hospitals

2.4.1. Concept of Health Care

Traditionally, the concept of health is defined only as no disease and disability. Individuals who do not have a specific symptom or disability are considered healthy. When the definitions made in the literature are examined, the definition of traditional health concept is defined in this way with general lines.

However, the definition accepted all over the world was made by the World Health Organization. According to this recognition, health; Not only the lack of disease or disability status, but physically, spiritually, and especially socially, it is not in a state of complete goodness. The status of "disease" is expressed as a change in this state of goodness (World Health Report, 1999). If we define the concept of health with another persfective in the light of medical science, there is a short and concise definition of not being ill and being fully a good. All services necessary for sustainable this complete state

of goodness are considered as health care. Health care is not only interested in diseases, but also includes preventive, preventive activities.

Prevention of disease formation, providing medical and social relaxing services to individuals who have lost their health, early diagnosis and treatment of sick individuals as well as possible, and ensuring that individuals in society continue their lives in a quality, happy, peaceful manner, the definition and purpose of health services is the definition and purpose of health services.

2.4.2. Health Care Features

The most important feature that distinguishes health care from other types of services is that it cannot be postponed or modified. Health care, which is one of the most important needs of society, is a social target, but also has characteristics such as being purposeful, being public, lacking information and serving a social purpose.

Although health care services seem to be fundamentally individual, the effects of differences in classification show that these services are social. The health care, which is among the basic rights of individuals, is also mandatory, such as nutrition, clothing, housing, so the flexibility of demand is limited.

Health care is not standard. Although the consumer determines the demand for other goods and services consumption, the physician determines the demand for the individual in health services, and the patient is not capable of measuring the quality of the service he receives. There is no case of substitution of goods in health care. For example, the same service provided by any doctor is either absent or is quite limited. There is no concept of time in health care. And 24-hour continuous service is provided (Akbelen, 2007).

It is not clear how much health care needs or consumption time. Consumption is coincidental; In addition to the fact that it is not clear when

the demand for service will be in the health sector, it is not clear the cost. It is not known where the request will be and when.

2.4.3. Basic Principles of Health Care

According to the directive on the execution of health services in Turkey, we can list these principles with some headings (Folland,2007). The population is the basic principle of health services in Turkey is organization. The geographic region of each unit is clear. Accordingly, health services have the principle of organization by population. It is the service of individuals everywhere and anywhere in accordance with the right. Accordingly, there is a principle of continuous service to the Community.

The team consists of different professional members who work for the same purpose. Any person on the team is no more important than the other. Accordingly, there is a Team Service policy.

First, second, and third-line services share services and refer to the referral system. Accordingly, there is a Gradual Service policy.

It is essential to improve the quality of services in terms of space, processing, product, etc. Accordingto this, there is a principle of Quality Approach in health care.

The participation of the public in planning and implementation of health services. Accordingly, there is a principle of Participation Service in health services.

The fact that individuals who are in danger of health benefit relatively more from the services. In this context, there is a risk approach principle in health care.

2.4.4. Health Care Goals

People are the focus of the purpose of health care. It is the main purpose of health care to keep every individual who makes up the society a healthy life and keep their health away from the dangers.

Health care always aims to reach more people. In this respect, service providers and established owners of health care organizations that produce services aim to reach a greater audience by using the economic income provided.

In the health service presentation, which is also considered as an indicator of development of societies, the increase in problems experienced with evolving technology and increasing population has led to the goal of increasing quality and quantity increase in health care.

2.4.5. Health Care Presentation in The World and Turkey

In order to be able to talk about being effective in the presentation of health services, it is very important to carefully examine the performance of the hospital where the service is provided, both in its establishment stage and in the presentation stage after its establishment. In this respect, health care is the way to be successful in its presentation is the importance given to the service organization.

Generally, health care policies can vary from country to country both in Europe and in other world countries. It's different because it's based on its own resources. In Iceland, England, Austria, Italy, Portugal and the Netherlands, patients perform health care needs through referral. Health care delivery in Turkey is offered mainly from two sources: private and public sectors. The Ministry of Health (MH) is inspected by these presentations.

In 2010, to reduce hospital loads the Directive on the Procedures and Principles of Home Health Services was published by MNH. A number of health services were transported to the home environment and the hospital

load was reduced; both satisfaction and density are reduced. As of 2014, home care services for disabled individuals have been harmonized with the European Union.

2.4.6. Hospital Concept

Hospitals are health care-producing businesses. Hospitals are undoubtedly the most important pillar of the health care system. created by many subsystems, The aim of the managers is to check all entries well and use resources at the optimum level in the complex hospital organization

The Inpatient Treatment Management Regulation has made the definition of the hospital as follows; Those who are suspected of disease, who want to check their health status, those who are sick or injured, are institutions that go out or are inpatient ly, examined, diagnosed, treated and rehabilitated or due to birth.

World Health Organization (WHO) hospitals; as a bed organization where patient individuals receive long and short-term treatment, serving in four subgroups including diagnosis, diagnosis, treatment and rehabilitation.

Hospital businesses are a public system. The inputs of health services in the hospital are patient, capital outcomes, information, manpower, technology, information. Its outputs are the treatment of patients, personnel trainings for the service, clinical trainings of students and interns, research development activities. The process includes execution, planning, organizing, control and reorganization activities (Tengilimoglu,2012).

Hospitals; businesses where the concept of profit is thrown into the second plan but productivity is followed, all kinds of health services are produced in an uninterrupted and economical manner, public health, education and research services are maintained.

2.4.7. Functions of Hospitals

The main activity of hospitals includes patient care and treatments. When examined functionally, financial function, Technical Function, Society's Health Level Upgrade Function, medical function have social functions. Hospitals serving public health have undertaken a very different mission from other sectors with these characteristics. Financial function; Health organizations, especially public hospitals and education research hospitals, whose main purpose is not to make a profit, have the costs of the tools, equipment, material satisfies, employees' wages, etc. Hospitals certainly have a financial function to meet them. And with this function, hospital contributes to the sustainability of services.

Patients are the cause of the existence of hospitals. Patients, on the other hand, are organizations with medical function, as long as humanity exists.

Management of all personnel working in the hospital, the creation and continuity of decision-making mechanism, organization, supervision, monitoring of all personal rights refers to the administrative function of hospitals.

In the continuity of service in hospitals, all maintenance services of buildings, maintenance of all equipment for heating and cooling, maintenance of the gas service, all necessary maintenance and repair services for the continuity of support services such as kitchen laundry, maintenance of the technical infrastructure owned, maintenance and calibration of all medical devices expresses the technical function of health organizations.

They show education and research function in order to receive the necessary trainings of the information power, which is seen as the most important input for the continuation of health care, especially university hospitals. They serve as well as services and educational institutions where technical personnel are trained.

The psychological and physical return of patients serving in health care institutions brings with it individual peace and subsequent social peace. The psychological and physical health of the individuals who make up the society will give a positive energy to the business life and social environment. We can refer to this as the social function of health care organizations.

Hotel service is also available as soon as health care is provided. Hotel management services are also provided in order to provide infrastructure for the full comfort of the patient and to provide health care to the relatives accompanying them. This shows that hospitals are hospitality functions (Koçyiğit, 2006).

2.4.8 Characteristics of Hospitals

Hospitals have many different services and functions, so they have different characteristics. Private, public and educational research hospitals aim to ensure the continuity of service by taking into account the economic principles in each of the hospitals.

2.4.8.1. 24-Hour Service of Hospitals

Depending on the principle of uninterrupted service, hospitals also have to provide continuous service, including public and religious holidays, public holidays and weekends, 24/7, due to the non-rejection principle of the right of treatment of everyone admitted to the hospital.

2.4.8.2. Hospital Service Organization Facility

When the literature is examined, it is seen that organizations are classified in different ways. Organizations by classification are examined in four subheadings (Dorgan,2010).

1. Organizations that protect member interests only.

2. Organizations that benefit owners.

3. Organizations that benefit customers.

4. Organizations that take care of the public interest.

Hospitals are organizations that benefit their customers, i.e. their patients.

2.4.8.3. Hospitals To Be Matrix Organizations

Hospitals have a wide range of service fish and a complex management character, so they are matrix. Serious effort is required to coordinate all functions in the matrix structure used for complex organizations. However, hospitals differ slightly from the classical martics structure. The person who is the manager in the matrix structure, while the manager (vertical) is responsible for the project manager (horizontal), while in hospitals, project managers have to work simultaneously with doctors, nurses, pharmacists, dieters, laborants, etc.

2.5. Supply Chain Management

2.5.1. Overview and Definition of Supply Chain Management

In current Market Conditions, health organizations aim for maximum efficiency by providing a supply chain activity that affects all patients in customer positions by going on the way to supply all the medical supplies, medicines and all other products it needs. Supply chain management covers the processes in which the products it needs to be provided, manufacture storage and usage in accordance with the appropriate cost and ethical rules at the appropriate amount of products needed in order to continue the activities of the business. At this point, it aims to deliver an effective supply chain and management to deliver it to its customers.

The services offered by businesses and the ability to maintain their share of the market share depend on the success of supply chain activities. To get a long-term share of the market share, it is extremely important for businesses to increase their productivity and keep their costs under control. In order to survive in a competitive environment, the most important topic is to take into

account customer requests and needs, i.e. health institutions for customer-oriented service delivery, and to evaluate supply chain activities at the center of processes in order to be successful in this process.

Figure 2. 5 also highlights the challenges of effective supply chain management along with the challenges encountered in supply chain implementations of the issue of cooperation in the supply chain. In an effective supply chain application, lack of training and resistance to change are seen as important topics for new thinking and skills.

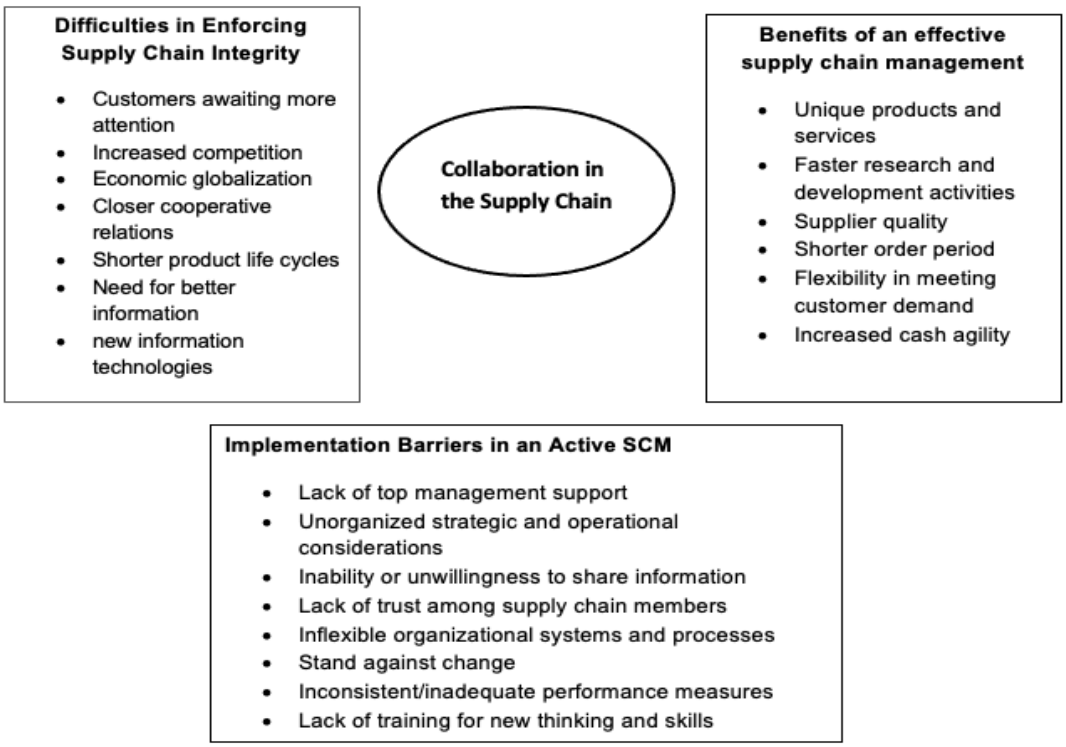


Figure 2.5. Collaboration in the Supply Chain

Manufacturing businesses, vendors distributing manufactured products, main dealers or distributors and all other logistics provider companies form a ring of the supply chain. With this ring, the access of raw materials, semi-finished and full products to the final customer, which will enable businesses to perform their main activities, evaluates the activities as the supply chain of the whole.

The planning of the procurement department is one of the most important factors in order for the business to carry out its activities. And in this respect, they have a much better function than any other department. Planned purchase costs and appropriate quality and quantity, convenient location and resource purchase is carried out to make ready for use.

2.5.2. Logistics And Supply Chain Management

Logistics service providers, distributors, manufacturers and retailers are defined as the Supply chain, all arguments that provide the flow of materials, products and information among them. In general, the supply chain is realized by the combination of a phase. Customers in the supply chain are wholesalers and distributors, retail salesmen, raw material providers and eventual consumers are the stages of the supply chain.

2.5.3. Processes, Inventory And Costs in The Supply Chain

Planning supply and demand, resource and supply management, production, storage and transportation, and customer order management subsystems form the structure of the supply chain. Planning, procurement, producing, transporting and selling are listed as actions carried out throughout the process in Figure 2.6.

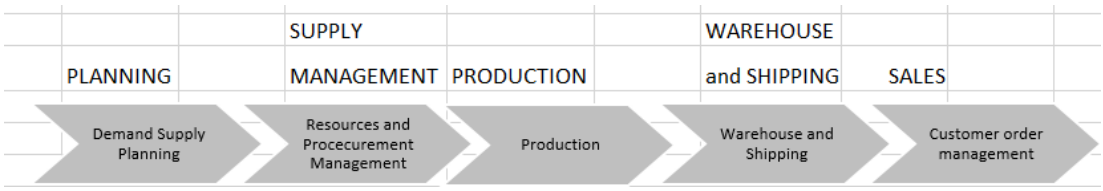


Figure 2.6. Processes in the Supply Chain

The flow of information is extremely important for the supply chain to proceed successfully. In supply chains, the flow of physical products from supplier to customer is realized, while the flow of information and cash flow starts from the end customer to the supplier.

2.5.4. Property of Lean Supply Chain

We can sort the characteristics of the lean supply chain as improved demand management, process and product standardization, waste and cost reduction, adaptation to industry standards, improved demand management, process and product standardization, cultural change and cross-company cooperation. The lean supply chain is focused on eliminating excesses and waste in the internal and external supply chain. This will reduce excessive inventories, unnecessary costs and repetitions.

In Figure 2.7, a lean supply chain roadmap is provided. It is stated that the flow throughout the supply chain will be positively affected in competition strategies as a result of continuous progress.

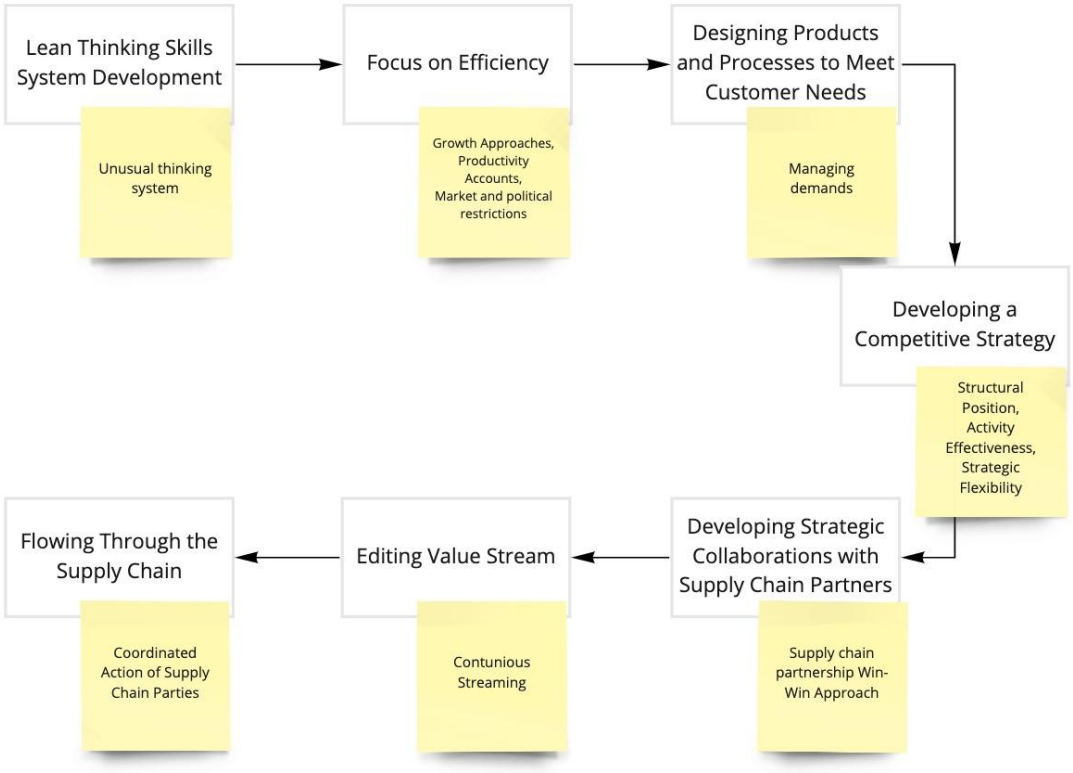


Figure 2.7. Roadmap in Lean Supply Chain (Srinivasan, 2011)

2.5.5. Components of the Lean Supply Chain

The success of the lean supply chain can only be achieved by embracing the simplicity of all components. Lean businesses have the opportunity to benefit from relationships by removing organizational boundaries, increasing information sharing and inventions. When the buyer does not find enough of the product quality, cost and timely distribution provided by business suppliers, it may face consequences such as going to produce the product itself, changing its supplier or developing its supplier. In order to gain a competitive advantage, the choice is to try to improve performance by going towards developing the method supplier. This can only happen with both businesses believing in the stark.

2.5.6. Lean Management Application In Hospitals in Turkey and Abroad

The spread of Lean Health practices in our country, which started in the USA and spread rapidly first in western Europe and then almost all over the world, is still quite limited.

Using data from the American Hospital Association's 2015 Annual Hospital Survey and the 2017 National Survey on Lean/Transformational Performance Improvement in Hospitals, linked to data on hospital performance by the 2015 Centers for Medicare & Medicaid Services, a study comparing public hospitals with nonprofit and nonprofit hospitals on the scope of lean practice; Of the 288 public hospitals that responded to the survey, 54.2% reported that lean health management practices were implemented. The average application time of lean health management applications is 4.58 years, the average number of units to which it is applied; 29, was in 11.9% of possible hospital units, and the emergency room was the most frequently implemented unit of lean health management practices.

There are very few hospitals among our country's hospitals that have officially declared that they have switched to lean management and supply chain implementation. Here, sampling and comparison can be made through several hospitals according to their own notifications from our country.

In 2011, lean transformation studies were initiated at Uludag University Faculty of Medicine and Private Bursa Medikabil Hospitals. Since 2015, it has been reported that lean practices have been initiated in some Public Hospitals affiliated with the Bolu Provincial Public Patients Association.

Lean transformation carried out at Uludag University Medical Faculty Hospital was carried out as a three-stage scientific project supported by University Scientific Research Projects, during which all the institution's directors were project researchers. After the pre-planning and training phase, where the entire project team received lean thinking trainings and visits were made to the industrial company, the effective lean practitioner in Bursa, three different pilot workspaces were selected and project teams were formed:

Outpatient Process Value Flow Map Creation and Process Flow Improvement Project: At the end of the project: patient waiting times decreased by 46% in the outpatient clinic where the project was implemented; the number of patients examined daily per physician increased by 34%; patient satisfaction increased by 7% and employee satisfaction increased by 9%.

Pharmacy Service Process Improvement Project: At the end of the project: the drug preparation time, which lasts until 14:00 before the improvement in the first batches of the day, has been reduced to 11:00; the average drug preparation time of technicians decreased from 32 min/clinic to 26 min/clinic; 1 pharmacist and 5 technicians who retired during the project process were not replaced by new employees, and despite all these gains, employee satisfaction increased by 6% compared to before the project.

Reducing SSI deduction rates on invoices project: At the end of the project: Epic spelling times of discharged patients have been reduced from 21 days to 2 days; patient bills issued in an average of 31 days started to be billed in 16 days; The error rate, which was determined as 27% in the Medula Conformity Check, was reduced to 6%, and then this process phase, in which

four personnel were employed, was completely eliminated and four personnel were used in different areas; The number of documents invoiced in the clinic where the pilot project was carried out increased by 17.5% month-on-month by increasing the average monthly amounts from 278 to 303 and the amounts of documents from TL 875,000 to TL 1,031,000.

As in the examples of lean management practices and lean supply chain applications, it is carried out in a way that includes the whole system rather than locally based and is the first in our country in this regard. Since our aim in this study is especially the perception of hospital staff and other side benefits obtained, separate studies are needed for numerical evaluations of the efficiency and efficiency of the whole system.

CHAPTER 3

METHOD

3.1. Purpose of Research

The main purpose of this thesis is to determine the effects of lean management and supply chain (LMSC) activities on organizational structure using objective and repeatable methods. In the literature, it was found that there were very few scientific studies aimed at determining the effects of LMSC activities in the health sector on the physical and functional structure of the entire hospital organization (personnel perception).

From this perspective, the results of the study will contribute to the expansion of this application by producing the information that will contribute to better management of personnel-related factors that have a central place in broadcast management applications, as well as to improve efficiency and quality in an important issue such as health care, contributing to the expansion of this practice, contributing to the implementation of methods aimed at reducing cost and waste. In addition, since the methods applied in this research are objective and repeatable, it will provide guidance on monitoring the long-term effects of LMSC activities and developing tests to make cross-business comparisons.

3.2. The Universe and The Sample of Research

As an example of research, Medipol' Megapol hospital, a large-scale hospital where lean management and supply chain activities will be carried out, was selected. Medipol University Faculty of Medicine Mega Hospital provides polyclinic and hospitalized services to 1.2 million patients per year. The

hospital with specialist physicians in 62 branches and with 2500 personnel is located in Istanbul which serves 18 Millions of population.

In June 2017, medical administration decided to start implementing LHCM practices in the hospital. Personnel reorganization and flow orientation, structural and supply chain modifications required to be carried out in the hospital in relation to the scope of the LHCM application. These were established through meetings attended by relevant units. Necessary trainings were given to the personnel before the required organizational structure and application changes were made. LHCM practices started to be implemented in all relevant units of the hospital in December 2017. Within the scope of this research, the effects of changes in the organizational structure and flow orientation of LHCM and supply chain applications previously decided by the hospital management were examined in detail.

Since the two basic principles of LM applications are continuous development and respect for people, it is planned to obtain visual data in the numerical and necessary units that can be obtained in the areas that can be achieved in the areas where the physical organizational structure, functioning scheme, quality of the sampled departments, efficiency, such as the physical organizational structure, the functioning scheme, the quality of the sampled sections, and efficiency before lhcm applications begin. The same data was recollected and compared to pre-application data to assess the effects of YYTZ applications, which began after changes in the hospital and trainings. In addition, to assess the impact of the principle of respect for human beings; As human factor in the functional structure of the organization, personnel related analyses were planned to be carried out.

For this purpose, the functional structure (personnel) constitutes; "Lean Management Data Collection Form" developed by Yaman (2007) and the "Supply Chain Management Data Collection Form" used by The Wholesaler (2013) to determine the impact of managers and employees on staff in lean management and supply chain management practices; Before the start of the applications and during the one-year period in which the applications were

continuing, the staff, which continues to work in the same hospital, were compared to statistical methods of data obtained by reapplying at the end of a one-year process to the staff, which included both managers and sub-unit employees.

The data collection form consists of three parts; questions about the demographic characteristics of the participants (8 Questions); questions about supply chain management (30 questions), and questions about the effects of lean management practices (48 questions).

Based on the 48 questions asked in this scoring scale, regarding the Business Characteristics Model (JCM), the personnel perception of 10 lean health practices proposed by De Treville and Antonakis in 2006 and used by Drotz and Poksinskan, are questioned; I. Continuous improvement II. Problem solving, III. Flow orientation, IV.Self-managed teams, V. Visual control, VI. Brief meeting, VII. Standardized work, VIII. Coaching and IX. Supporting leadership style, X.5S (Seiri-Idle detection, Seiton-proper placement, Seilo-cleaning, Seiketsu-standardization, Shitsuke-discipline)

The scoring scale chosen for this purpose was applied on our hospital staff twice; first, before the LHCM trainings (September 2017) and second, after the implementation of LHCM for 12 months (December 2018).
About each issue that is applied in the data collection forms; acceptance status according to the 5 lirt scale; "I definitely disagree" (1), "I disagree" (2), "What I agree with nor disagree" (3), "I agree" (4) and "I absolutely agree" (5). Evaluations made before and after one year of LHCM applications and comparing data obtained from the survey with the participation of a total of 286 personnel (including managers and subemployees) were made using the MINITAB statistics program.

All statistical analyses were performed using the MINITAB 17 software (Minitab Ltd. Co., England). The scoring results were reported as the mean ± standard deviation.

3.3. Duration of Research

The research began in September 2017 before moving on to medipol University Megapol Hospital's lean management and supply chain applications, and after the one-year period of applications started after the trainings given to the staff, the second survey application was carried out in January 2019 and the information acquisition process was completed. The data was then flowed into the computer environment in February 2019 for statistical analysis.

3.4. Limitations of Research

The closest scale used in the literature has been adapted for the study due to the lack of a method or test facility to control lean management activities with previously made objective data, which is the subject of the research. According to the results of the study, a better scale will be produced.

3.5. Data Collection Form

The data collection form consists of three parts; questions about the demographic characteristics of the participants (8 Questions); questions about supply chain management (30 questions), and questions about the effects of lean management activities (48 questions). Based on the 48 questions asked in this scoring scale, regarding the Business Characteristics Model (JCM), the personnel perception of 10 lean health practices proposed by De Treville and Antonakis in 2006 and used by Drotz and Poksinskan, are questioned; I. Continuous improvement II. Problem solving, III. Flow orientation, IV.Self-managed teams, V. Visual control, VI. Brief meeting, VII. Standardized work, VIII. Coaching and IX. Supporting leadership style, X.5S (Seiri-Idle detection, Seiton-proper placement, Seilo-cleaning, Seiketsu-standardization, Shitsuke-discipline).

3.6. Processing and Time of Data

All expenses of the study were covered by the researcher. The data obtained in the study was completed in March 2019 and statistical results were analyzed.

CHAPTER 4.

FINDINGS

4.1. Effects of Lean Management and Supply Chain Applications on Organizational Structure

4.1.1. Effects on Organizational Structure

It was observed that the communication structure between the upper management and management departments of the hospital before starting lean management practices and therefore the hierarchical organizational structure was complex and at the same time vertical structure as seen in Figure 4.1. Due to this structure, the step-by-step output of communications upwards indicates a problematic situation both in terms of duration and processing efficiency.

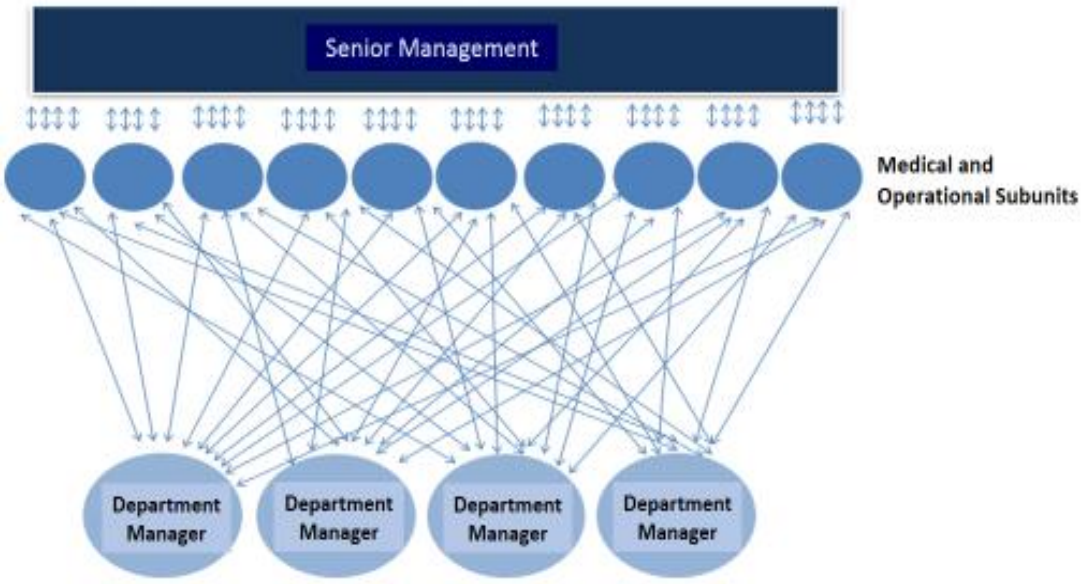


Figure 4.1. Organization Structure Before Lean Health Management Practices (2017 July)

Together with lean management practices, the organizational structure has produced a much faster and more efficient study. As a result of lean management practices, it was observed that the organizational structure is formed horizontally as seen in Figure 4.2 and besides the ease of access, the time is very shortened and the result efficiency increases.

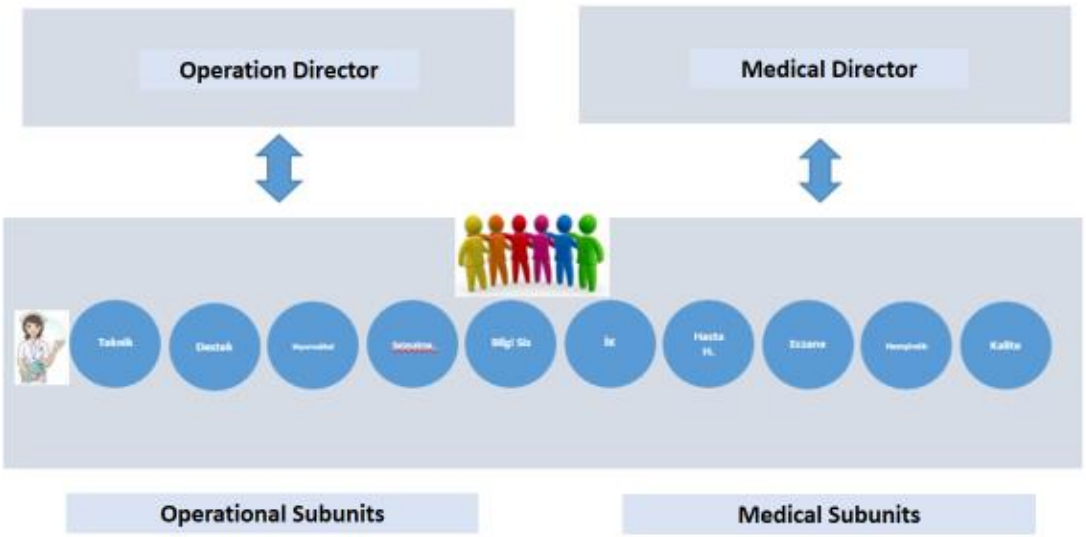


Figure 4.2. Organization Structure After Lean Health Management Practices

The personnel hierarchy system was changed according to the requirements of lean health management practices in the hospital. When the effects of these changes on the hospital organizational structure were examined, we determined the main change was in the management hierarchy and changed to horizontal rather than the vertical structure (Figure 4.1,4.2).

Before lean management practices, it was seen that the manual and written demands of the hospital biomedical directorate from in-hospital services had a complex structure and that there were difficulties in fast-tracking the requests. The problem with this process is given in Figure 4. 3 of the squat study. It is replaced by a medinet program with classic paper.

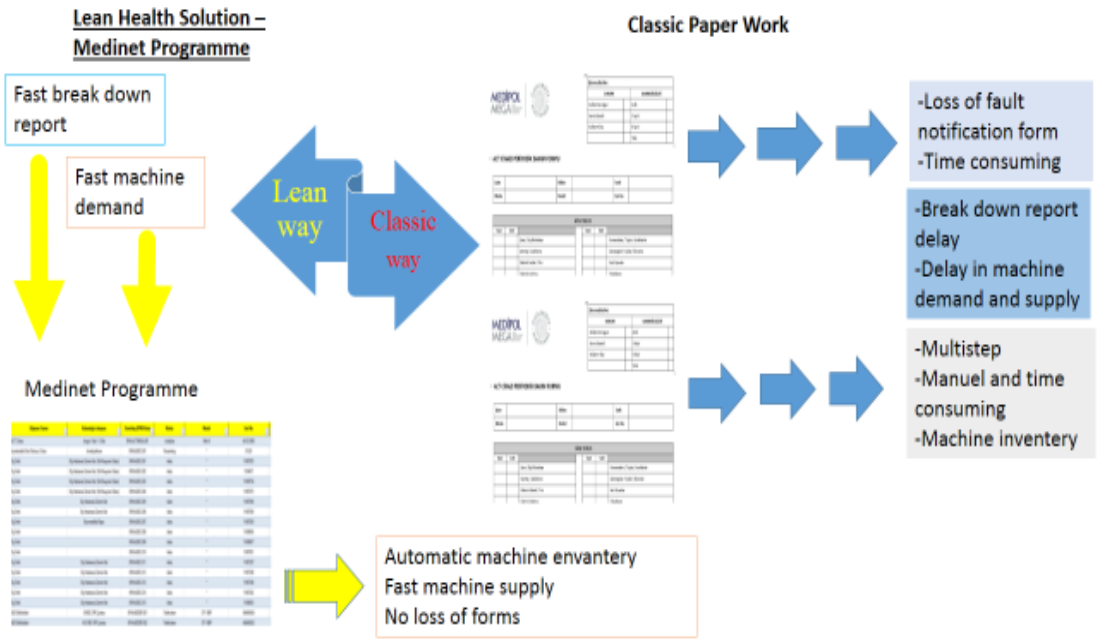


Figure 4.3. Solving Problems with Medipol university Single Step Medinet Program

As shown in Figure 4. 4, after lean management applications, it was seen that biomedical device maintenance and repair requests became a fast and error-free structure by digitally moving the requests from the hospital biomedical directorate from in-hospital services to digital media through the medinet program.

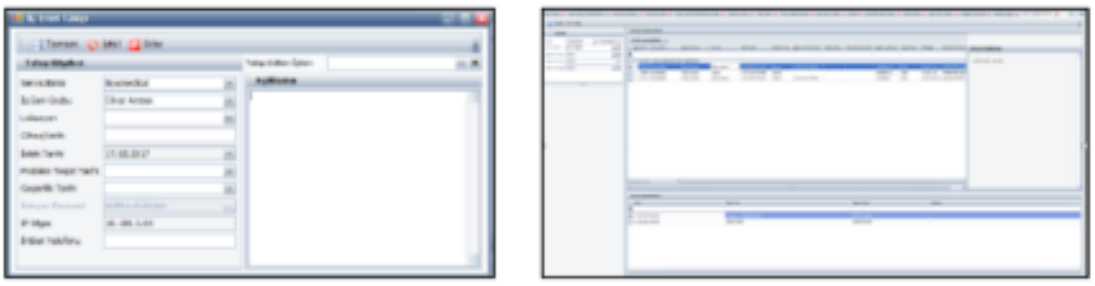


Figure 4.4. Transmission of Machinery Problems with Medinet Program

As shown in Figure 4. 5, a new indicator has been introduced to the department activities as the problem solving times are easily calculated by following the manual follow-ups that are examples of lean management applications on the system.

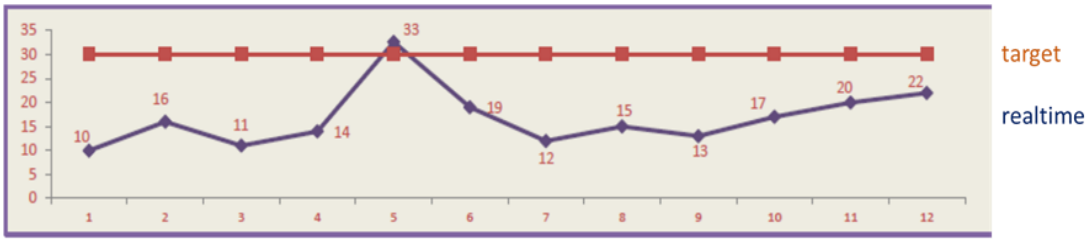
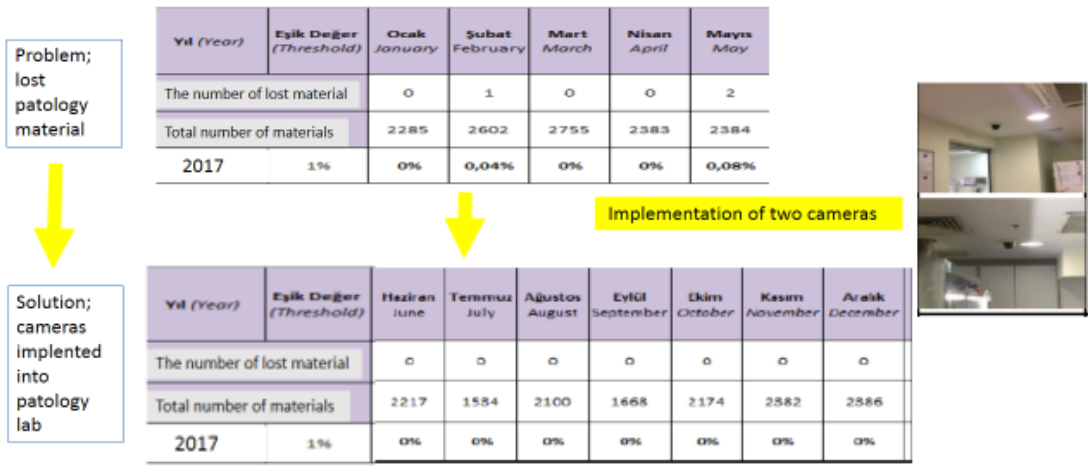


Figure 4.5. Problem Solving Time Tracking with Medinet program (Minute)

Before lean management applications, the benefits of the application were seen with values consistently below the threshold determined thanks to the study on possible meteral losses in the pathology service of the hospital. This study, which will be an example of problem solving with short meetings, is shown in Figure 4.6.



Yıl (Year)	Eşik Değer (Threshold)	Ocak January	Şubat February	Mart March	Nisan April	Mayıs May
The number of lost material		0	1	0	0	2
Total number of materials		2285	2602	2755	2383	2384
2017	1%	0%	0,04%	0%	0%	0,08%

Yıl (Year)	Eşik Değer (Threshold)	Haziran June	Temmuz July	Ağustos August	Eylül September	Ekim October	Kasım November	Aralık December
The number of lost material		0	0	0	0	0	0	0
Total number of materials		2217	1584	2100	1668	2174	2882	2886
2017	1%	0%	0%	0%	0%	0%	0%	0%

Figure 4.6. Problem Solving Sample Application with Short Meetings

As an example of lean management practices, it has been determined that waste occurs in the water flowing from the taps in daily efficiency meetings between departments. It has been seen that productivity increase is achieved

by finding a lean solution to the productivity problem. An example of increased efficiency is shown in Figure 4. 7 of this study.

Figure 4.7. Productivity Increase Sample Application with Daily Meetings

It has been observed that the speed of results in laboratory service has been improved with the application of business standardization for lean management applications.

In this way, it was determined that results were obtained below the threshold value determined in the indicator data.

It has been observed that unnecessary waste of time is prevented in the hospital laboratory service with business standardization, which is one of the lean management applications. Figure 4. 8 shows the provision of time waste by mapping the value stream.

Figure 4.8. Prevention of Waste of Time with Business Standardization Sample Application

It has been observed that unnecessary waste is prevented in the hospital laboratory service by placing 5s, which is one of the Lean Management applications. Figure 4. 9 shows the provision of waste of time by mapping the value stream.

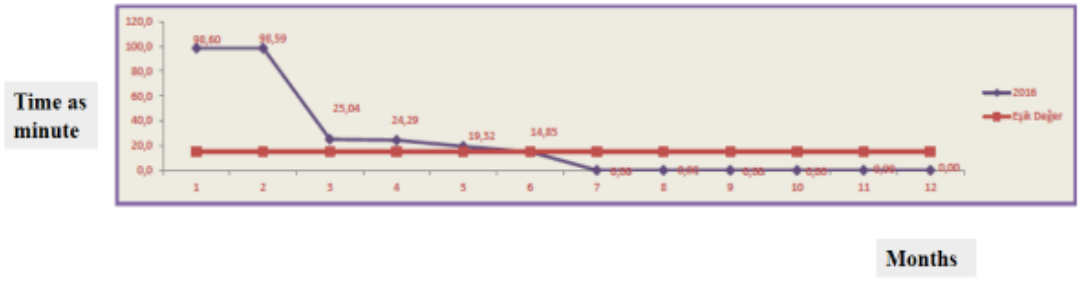


Figure 4.9. Prevention of Waste of Time with Value Flow Mapping

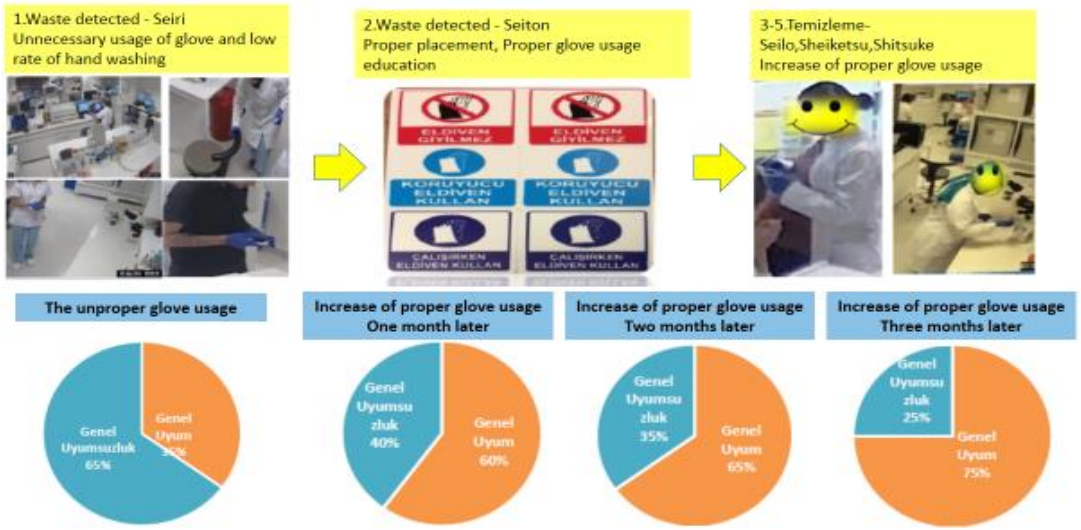


Figure 4.10. An example study for the placement of 5S applications in the hospital

The shelf and coding system were started to be implemented with the work carried out for the lean supply chain in the medical consumable warehouse connected to the logistics service of the hospital. With this application, the easier availability of products in logistics services and systemic coding and service speed have been increased. Studies on shelf and coding system in medical consumables warehouse are shown in Figures 4. 11 and 4. 12.

Figure 4.11. No Shelf and Coding System Before LHM Application – 2017

Figure 4.12. Shelf and Coding System After LHM Application – 2018

Evaluation Criteria; and the follow-up of the patients was recorded through the MEDINET program. Thanks to the Medinet program, the need for staff relocation and face-to-face interviews within the hospital has been reset and thus a low risk for time efficiency and infection is provided. Figure 4.13 shows the transition to guide revision and medinet application after lean supply chain implementation.

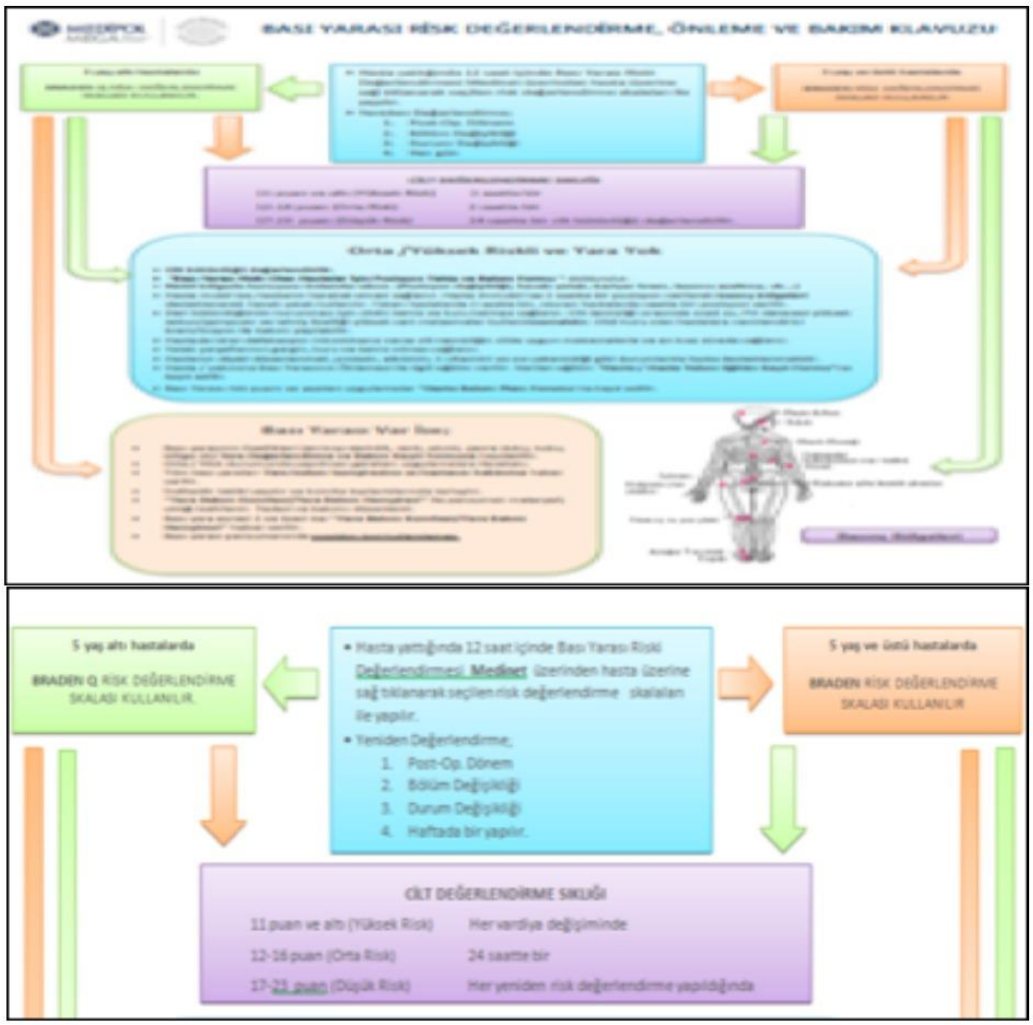


Figure 4.13 Accelerating Guide Revision After YTZ Application with Medinet Program

Evaluation Criteria; and recorded through the Medinet program.

The topics for lean health applications tested in the survey application, which is subject to the study are shown in the figure 4.14.

Figure 4.14 Lean Health Practice and Supply Chain Headlines Tested with Survey Questions

Figure 4.15 shows the timeline of research application and the time intervals at which lean health applications are implemented.

	Jun.17	Aug.17	Sep.17	Oct.17	Dec.17	Dec.18	Jan.19	Feb.19
Medipol Hospital Decision to Switch to Lean Health Practices								
Obtaining Research Ethics Committee Approval								
Application of the Survey 1. Questionnaire to the Personnel								
Giving Lean Health Practices Training to Staff								
Lean Health Applications Beginning								
Lean Health Practices Completing One Year								
Application of the Survey 2. Questionnaire to the Personnel								
Making Survey Statistics								

Figure 4.15. Timesheet of the Research Application

4.1.2. Effects on Personnel

The second subject of this study was the perceptions of the personnel before and after LHCM practices, which were analyzed carefully. This data obtained were analyzed and the effect of all employees working on LHCM practices was investigated.

	Managers (N: 46)	**Personnel (N: 240)**
Age (Mean ± SD)	34.89±6.97	31.2±7.12
Sex (M/F)	31/15	139/101
Supply (Related/Other departments)	10/36	56/184
Work environment(n:%)		
Operating Theater	-	14(4.9)
Department	7(2.4)	50(20.8)
Polyclinic	10(3.4)	56(19.6)
Laboratory	1(0.03)	17(5.9)
Support	28(9.7)	103(36)

1 Table 4.1. Descriptive Data of The Staff Involved in the Study 1

170 males and 116 females and 286 volunteers participated in the study. The mean age of the employees was 31.77 ± 7.18 years, 240 of them were employees, 46 of them were in the managerial position, 66 were related to the supply chain and 220 were working in other hospital units. As a result of the evaluations made within Medipol Hospital; within the scope of lean management practices, during the execution of the work-related value flow, studies were made to improve the business processes, based on employee

participation and continuous improvement, and plans were made on the identified subjects. According to this data, it has been observed that the employees involved in the study on a voluntary basis are in the young category.

It has been observed that approximately 1/3 of the employees work in supply chain units, and the proportion of other unit employees is in favor of support unit workers in clinical services (Table 4.1). Considering these figures, it was thought that the units of the study greatly reflected the whole hospital.

	Criteria	**N (%)**
Gender	Female	116(41.6)
	Male	170(59.4)
Education	Middle - high school	55(19.2)
	Associate degree	77(26.9)
	Undergraduate	88(30.8)
	Graduate degree	35(12.2)
	Postgraduate	31(10.8)
Service duration	1-3 year	144(50.3)
	4-7 year	83(28.7)
	8-11 year	40(14)
	More than 12 years.	29(6.6)
Marital status	Single	112(39.3)
	Married	143(50.2)
	Divorced	31(10.5)

Table 4.2. Descriptive Data of The Staff Involved in the Study 2

It was determined that 59.4% of the employees who participated in the study were male, they were largely university graduates, the average time of work in the hospital was long, and 50.2% of the employees were married.

Based on the 48 questions asked in this scoring scale, which examines the effects of the LHCM practices on the institution staff by 48 questions previously applied and published by Yaman in the Turkish literature (Yaman,2007). By this scale regarding the Business Characteristics Model (JCM), the personnel perception of 10 lean health practices proposed by De Treville and Antonakis in 2006 and used by Drotz and Poksinskan, are questioned; I. Continuous improvement II. Problem solving, III. Flow orientation, IV.Self-managed teams, V. Visual control, VI. Brief meeting, VII. Standardized work, VIII. Coaching and IX. Supporting leadership style, X.5S (Seiri-Idle detection, Seiton-proper placement, Seilo-cleaning, Seiketsu-standardization, Shitsuke-discipline)

The scoring scale chosen for this purpose was applied on our hospital staff twice; first, before the LHCM trainings (September 2017) and second, after the implementation of LHCM for 12 months (December 2018). About each issue that is applied in the data collection forms; acceptance status according to the 5 lirt scale; "I definitely disagree" (1), "I disagree" (2), "What I agree with nor disagree" (3), "I agree" (4) and "I absolutely agree" (5). Evaluations made before and after one year of LHMS applications and comparing data obtained from the survey with the participation of a total of 286 personnel (including managers and subemployees) were made using the MINITAB statistics program.

All statistical analyses were performed using the MINITAB 17 software (Minitab Ltd. Co., England). The scoring results were reported as the mean ± standard deviation. Student’s t-tests were performed for statistical significance analyses of the difference between the survey results. $P < 0.05$ was considered as the statistical significance level.

All statistical analyses were performed using the MINITAB 17 software (Minitab Ltd. Co., England). The scoring results were reported as the mean ±

standard deviation. Questions about lean health practices and statistical testing the hypothesis of 1) "the scores of the post-LHCM survey is higher than those of the pre-LHCM survey for question no 1-7, 9-11, 13-21, 23-28, 31-48" and "the scores of the pre-LHCM survey is higher than those of the post-LHCM survey for the questions no 8, 12, 22, 29 and 30" (Proved hypothesis = t >

1.66).

TheProblem Solving Principle of Personnel The answers to 3 headings asked to the associated personnel are included in Table 4.4.

No	Question	Pre/Post-LHCM	(n answers) Average Score ± Standard Deviation	t
Questions about continuous improvement				
2	Our institution is in a continuous effort to have quality	Pre	(286) 3.63 ± 0.76	**2.86**
		Post	(286) 3.81 ± 0.74	
17	Our institution responds to technological improvements in a short amount of time and change accordingly	Pre	(286) 3.5 ± 0.87	**2.22**
		Post	(286) 3.66 ± 0.85	
33	In our institution, everybody chases perfection without needing any kind of supervision when performing their duty	Pre	(285) 3 ± 1.14	**2.44**
		Post	(286) 3.24 ± 1.2	
39	There are activities for continuous improvement in our institution	Pre	(283) 3.53 ± 0.88	**3.10**
		Post	(283) 3.76 ± 0.89	

Table 4.3. The answers of the personnel on the Principle of Continuous Development

No	Question	Pre/Post-LHCM	(n answers) Average Score ± Standard Deviation	t
Questions about problem-solving				
4	This survey about the problems we face at our institution gets our opinion through direct communication or other methods	Pre	(286) 3.54 ± 0.89	7.64
		Post	(286) 4.12 ± 0.92	
10	There is a common language in our institution to solve the reasons of problems	Pre	(286) 3.62 ± 0.84	3.11
		Post	(286) 3.83 ± 0.77	
11	An investigation is done until finding the actual reason for the problems that occur when performing my duty and until providing a solution to these problems	Pre	(285) 3.23 ± 1.04	12.96
		Post	(286) 4.19 ± 0.69	

Table 4.4. Related Answers to The Problem Solving Principle of Personnel

Table 4. 5 contains the answers to 6 headings asked to the staff regarding the Principle of Flow Orientation of Personnel

Questions about flow orientation				
5	In our institution, we pay attention to simplicity when performing our duties	Pre	(286) 4.05 ± 0.934	4.99
		Post	(286) 4.38 ± 0.608	
21	In our institution, it is easy and free from bureaucracy to reach the department of quality check and quality assurance	Pre	(286) 3.47 ± 0.873	3.92
		Post	(286) 3.76 ± 0.892	
30	In our institution, there is an effort to make the waiting period of the employees for work taken to a minimum when performing duty	Pre	(286) 3.66 ± 0.812	14.54
		Post	(286) 2.39 ± 1.228	
31	The services and duties performed in our institution meets the expectations of the other users at a significant level	Pre	(286) 3.84 ± 0.781	2.44
		Post	(286) 4.00 ± 0.779	
37	In our institution, the material flow is right on time by the request of the lower departments	Pre	(286) 3.42 ± 0.951	3.38
		Post	(286) 3.70 ± 1.022	
38	All the sources are used efficiently in our institution	Pre	(285) 3.56 ± 0.856	4.71
		Post	(286) 3.90 ± 0.864	
41	Employees make an extra effort to get fast results from the work and processes done	Pre	(286) 3.54 ± 0.869	2.90

Table 4.5. Related Answers to The Principle of Flow Orientation of Personnel

Table 4. 6 contains the average responses of the personnel to a total of 5 topics for the individual team principle.

Questions about self-managed team procedures				
9	Learning about other job branches as well as your main job branch will decrease the dullness of work	Pre	(285) 3.56 ± 0.89	3.01
		Post	(286) 3.79 ± 0.93	
14	Our institution approaches to its duties in an understanding of team spirit	Pre	(283) 3.53 ± 0.84	2.96
		Post	(286) 3.74 ± 0.85	
34	In our institution, there are only mistakes of my own making during my services and duties	Pre	(286) 3.15 ± 1.14	4.68
		Post	(286) 3.58 ± 1.05	
35	In our institution, I personally work for perfect without needing any kind of supervision wh performing my duties	Pre	(283) 3.64 ± 1	2.64
		Post	(285) 3.85 ± 0.89	
47	I am adequately knowledgeable about our institution and its culture	Pre	(282) 3.68 ± 0.84	3.69
		Post	(286) 3.94 ± 0.84	
		Post	(286) 3.74 ± 0.89	
		Post	(286) 3.94 ± 0.84	

Table 4.6. Individual Management Team Principle Related Answers of personnel

Table 4. 7 contains the average responses of the personnel to a total of 2 topics for the principle of visual control.

Questions about visual control				
12	In our institution, problems that occur out of my control when performing my duty, come from a lack of quality checks	Pre	(286) 3.32±0.54	10.94
		Post	(286) 2.88±0.41	
27	When run into problems or failures in daily work programs, the procedures of documenting and recording them are performed fully	Pre	(283) 3.6 ± 0.84	10.55
		Post	(286) 4.38 ± 0.92	
		Post	(286) 3.78 ± 0.892	
		Post	(286) 3.94 ± 0.84	

Table 4.7. Related Answers to the Principle of Visual Control of Personnel

Table 4. 8 contains the average response of the staff to a total of 5 topics for the principle of short-term meetings.

Questions **about** brief meetings				
1	We get enough trainings to have quality in our institution	Pre	(286) 2.97 ± 0.92	10.91
		Post	(286) 3.73 ± 0.73	
15	There is a direct and healthy communication in our institution	Pre	(283) 3.56 ± 0.85	2.58
		Post	(286) 3.74 ± 0.81	
24	When run into problems or failures in daily work programs, the procedures of documenting and recording them are performed fully	Pre	(283) 3.6 ± 0.84	10.55
		Post	(286) 4.38 ± 0.92	
28	Daily-monthly and yearly plans are made about my duty or the other departments in our institution	Pre	(286) 3.66 ± 0.79	2.48
		Post	(286) 3.83 ± 0.84	
48	Enough planning is done in our institution to predict the future	Pre	(286) 3.51 ± 0.92	3.35

Table 4.8. Related Answers to The Principle of Short-Term Meetings of The Staff

Table 4. 9 contains the average response of the personnel to a total of 4 topics for the standardized principle of operation.

Questions about standardized work				
13	Things are done transparently in our institution	Pre	(285) 3.42 ± 0.918	3.55
		Post	(286) 3.67 ± 0.753	
26	In our institution, the jobs besides the main work are outsourced to the firms or companies who are professionals in their field (Catering, transport, storage, security, cleaning, training, using devices, etc.)	Pre	(283) 3.56 ± 0.875	2.83
		Post	(285) 3.77 ± 0.896	
42	In our institution, we are informed about what the ideal conditions are	Pre	(285) 3.55 ± 0.802	2.43
		Post	(286) 3.72 ±0.861	
43	In our institution, we have a habit of using a checklist for standard work methods	Pre	(285) 3.54 ± 0.909	3.69
		Post	(285) 3.82 ± 0.898	
		Post	(286) 3.94 ± 0.84	

Table 4.9. Related Answers to the Standardized Transaction Principle

Table 4. 10 contains the average response of the personnel to a total of 3 topics for the principle of coaching.

Questions about coaching				
3	Necessary efforts are made to include us in the management decisions as employees and to inform us	Pre	(286) 3.60 ± 0.800	0.88
		Post	(286) 3.66 ± 0.816	
8	I can't find the opportunity to improve myself in my field due to the volume of daily duties	Pre	(286) 3.56 ± 0.883	6.38
		Post	(286) 3.07 ± 0.945	
16	In our institution, the authority and responsibility is distributed in the appropriate amount	Pre	(282) 3.43 ± 0.926	4.59
		Post	(286) 3.79 ±0.943	

Table 4.10. Related Answers to the Personnel Coaching Principle

Table 4. 11 contains the average response of the personnel to a total of 3 topics for the principle of supporting leadership style

Questions about supporting leadership style				
25	In our institution, our subordinates are given the authority and responsibility about the things they do	Pre	(283) 3.42 ± 0.85	3.33
		Post	(285) 3.66 ± 0.87	
40	For continuous development, the level of getting help from experienced employees is high	Pre	(280) 3.48 ± 0.88	2.84
		Post	(283) 3.69 ± 0.88	
45	I am motivated and encouraged as I needed in my department when corporation changes and improvements occur	Pre	(286) 3.49 ± 0.93	4.61
		Post	(286) 3.84 ± 0.88	

Table 4.11. The Answers associated with the Principle of The Leadership Style of the Staff

Table 4. 12 contains the average response of the personnel to a total of 12 topics for the principle of supporting leadership style.

Questions about 5S (sorting, regulation, cleaning, standardization, internal discipline)				
6	In our institution, our work environment is in line with the working conditions about simplicity	Pre	(286) 3.59 ± 0.806	2.01
		Post	(286) 3.73 ± 0.854	
7	If my work place is adjusted to have the simplicity I would like to have personally, it would make us gain more time	Pre	(286) 3.62 ± 0.973	2.67
		Post	(286) 3.83 ± 0.903	
18	Assuming that we do not have military discipline in our institution, we can say that we have a full work discipline	Pre	(284) 3.40 ± 0.883	7.34
		Post	(286) 3.95 ± 0.903	
19	In our institution, simplicity is prioritized in the methods applied to perform duties	Pre	(283) 3.48 ± 0.818	5.65
		Post	(286) 3.89 ± 0.909	
20	There are physical arrangements to get the job done the fastest and easiest way in our institution	Pre	(286) 3.54 ± 0.831	4.04
		Post	(286) 3.84 ± 0.936	
22	The supervision that is done when performing a duty is at the extent of hindering our duties	Pre	(285) 3.20 ± 0.957	4.19
		Post	(286) 2.86 ± 0.979	
23	There is always an investigation and enhancement in our institution to take out the unnecessary jobs and processes from the work schedule	Pre	(285) 3.39 ± 0.851	5.33
		Post	(286) 3.78 ± 0.892	
29	There are unnecessary and repetitive jobs in our institution and they affect our performance negatively	Pre	(286) 3.45 ± 0.792	14.70
		Post	(286) 2.47 ± 0.797	
32	A job description is done about the work done or services provided in our institution	Pre	(285) 3.69 ± 1.006	5.03
		Post	(286) 4.08 ± 0.832	
37	In our institution, it is important to be economical when using resources	Pre	(285) 3.53 ± 0.88	2.83
		Post	(286) 3.74 ± 0.89	
44	In our institution, there is always a review activity about the jobs done or new subjects	Pre	(286) 3.57 ± 0.879	2.98
		Post	(286) 3.78 ± 0.797	
46	The resources in our institution are managed efficiently	Pre	(286) 3.55 ± 0.89	5.37
		Post	(286) 3.94 ± 0.84	

Table 4.12 5S Principle Related Answers of personnel

CHAPTER V

DISCUSSION

5.1.Impact of Lean Health Management and Supply Chain Activities on Organizational Structure

5.1.1. Impact on Organizational Structure

The results of our study will be evaluated in two groups: Effects on organizational and effects on personnel after LHCM practices.
As a result of the evaluations realized within Medipol Hospital during the execution of the work-related value flow, plans were made to improve the work processes, based on employee participation and continuous improvement (Brajer,2018, Bowe,2019, Smith,2012) The personnel hierarchy system required by the LHCM practices in the hospital was changed. When the effects of these changes on hospital organizational structure were examined, it was determined that the main change was in the form of transformation from vertical structure to horizontal structure in the management hierarchy (Figure 1, 2).

LHCM practices in Medipol Hospital are still in progress and necessary arrangements have been made under other titles such as continuous improvement, problem solving, short meetings method, efficiency, and 5 S. Some examples of regulation examined in the context of this article were reported below;

The forms prepared to ensure that problems and new demands on machinery, equipment, consumables etc. in the hospital before lean health management and supply chain applications can be communicated to management were first filled by the clinical staff and taken to the staff at the unit's superintendent's desk after being approved to the department supervisor. The relevant supervisor also provided that this list of demands and problems be made to the supply manager for the purchase-related requests within the appropriate period, and if the problem was forwarded, a plan was made to resolve the issue provided that the relevant unit was responsible and forwarded it to him. The relevant units would also receive these notifications that were forwarded to them on their work lists and went on to resolve them with the approval of the top manager. Once the solution was produced, the issue was resolved by providing information to the unit about the same mechanism again. With the development of the Medinet program, many steps of this process have been skipped and a lot of the steps of this process are skipped and dropped directly into the relevant solution provider unit screen, sometimes steps have been taken in the next day at the latest in the day (Figure 3.4a,4b).

Such losses were repeated within months as it was not possible to bring together those responsible for solving medical and forensic problems such as loss of pathology materials in hospital applications before lean health management and supply chain applications.

The process could not be ended successfully because decisions could not be made at the general meeting where these problems were reported. Quick, short-term and agenda-oriented small staff meetings for the detection of the problem and solution proposals were made and solution plans were implemented. No pathology material was lost during the second six months of the year (Figure 5).

The idea of cost analysis of consumables and continuously used materials was decided in daily meetings. The evaluation of these analyses was made without delay in the following days and the problem was detected. Small

apparatus added to taps reduced water costs by 25% year-on-year, increasing productivity (Figure 6).

The decision taken in accordance with the principle of business standardization of lean health practices, the results of the culture samples taken in different units in two days reduced the efficiency of the time to reduce the efficiency of patients who need to come to the hospital for an extra day for the results of the results, as it is thought that the conclusion of the next day will reduce the time waste of the decisions taken in the meeting with the relevant units, the process was accelerated and the results of the culture began to be made in one day. This increased patient satisfaction as the patient did not need to return for the second day of the examination as well as increase the start rate of treatment for patients (Figure 7).

According to the principle of reducing waste by tracking the flow of value, which is one of the principles of lean health practices, the accumulations at waiting points were questioned by monitoring the waiting times of the patients in polycnics and significant reductions were achieved during the waiting times of the patients (Figure 8).

Again, solution applications were implemented and very high success was achieved after trainings were given because it was found that the principle of 5 S (Seiri, Seiton, Seilo, Sheiketsu, Shitsuke) was implemented in the principles of lean management practices was inadequate and unnecessary glove use was needed to solve the problem (Figure 9).

Examples of the change in supply chain monitoring before lean management applications have been developed by developing a shelf and coding system, making stock counting easier and increasing material counting and coverage speed. In addition, the waste was prevented by tracking products that may be likely to enter the deadline (Figure 10 a,b).

In another application, pressure assessment, prevention and maintenance guidance, pressure injury risk assessment, prevention and maintenance guidance to reduce pressure rates, which significantly reduce the quality of

life of bedridden patients who lie for a long time, increased the frequency of evaluation of patients and decreased pressure wound rates (Figure 11).

In addition, patient follow-up records were added to the MEDİNET program developed within the framework of lean health practices and retrospective and instant patient monitoring was provided (Figure 11).

5.1.2. Effects on Personnel

A total of 286 people (29 ± 5 years, 170 males and 116 females) participated in the study voluntarily. The mean age of the employees was 31.77 ± 7.18 years. By the way, 240 of the participants were employed, 46 were managers, 66 were related to the supply chain and 220 were working in other hospital units (Table 1,2).

In a hospital where LHCM are applied; Employees' wages are not seen as a cost, on contrary, they are one of the main values and constitute a very important part of the value flow chart. Hospitals that make LHCM planning prioritize health and satisfaction of employees while making plans for employees to work efficiently, successfully and in a secure environment with high capacity. In addition, the fact that the personnel are aware of the LHCM practices and play a supporting role by taking a positive attitude in the practices contribute to the success of the LHCM practices. Training, support, awareness raising and value-flow schemes of the personnel are planned to follow up the developments regarding the patient-related processes. Implementation of the innovations in the health affairs, while ensuring the intellectual contribution of the personnel, increases the job satisfaction and pleasure. As a result, improvements in opinion of employee ensure fast, efficient and effective delivery of services to the customer, which is the last ring in the chain, and increases the satisfaction of the patient. Studies have shown that such an application is also effective in preventing waste and reducing expenditures (Kaplan 2008, Waring 2010).

In this study, the answers given to the questions of the questionnaire repeated before and after one year of application. We determined how the perceptions of personnel about LHCM practices were affected by lean health

practices (Figure12). Agreed and strongly agreed options in the answers given to the questionnaire were evaluated as positive answers and the other three answers were evaluated as negative. The results of the survey were grouped as + and -. In addition, the numerical evaluation of the answers given is shown in the tables (Table 3-12).

Analysis for changes of opinion of the employee questionnaire showed that the results of 10 basic applications of lean management practices had very positive and meaningfull results, as follows:

I. Continuous improvement

The analysis of the cumulative results of the answers related to the change in the opinion of employees about the continuous improvement after implementation of lean principles revealed that the positive perception of the employees were significantly increased (Question ;2,17,33,39; change of total positive options before vs after questionaire, respectively: 3.63 ± 0.76 vs 3.81 ± 0.74(t=2.86), 3.5 ± 0.87 vs 3.66 ± 0.85(t=2.22), 3 ± 1.14 vs 3.24 ± 1.2 (t=2.44), 3.53 ± 0.88 vs 3.76 ± 0.89, (t=3.10), Table 3).

In order to ensure continuous improvement, all problems experienced by employees during the day should be recorded and shared with managers, and continuous efforts should be made to solve these problems one by one. Continuous improvement practices may be related with any problems that contribute to the patient and the staff in the hospital. For example, Bowe et al. reviewed the effects of the laryngotracheal reconstruction on the pediatric patients' life quality and suggested improvements in some applications. They also emphasized the importance of electronic recording systems for continuous improvement (Brajer, 2018). In another hospital, a project was initiated for employees to write the problems on post it papers and put on a common whiteboard daily, and these problems were evaluated through weekly management meetings and solution projects were created. Due to the implementation of continuous improvement practices, the satisfaction of the employees in the units declined for a while, but after appearance of effects of the solutions become visible at the unit, the employee satisfaction increased and the number of post-its declined, significantly. In our hospital, a special

computer program called *Medinet* was developed by our computing personnel and put into practice in order to identify problems in our hospital and manage them more quickly. The data obtained from all units of hospital by online system were evaluated through weekly meetings and solution projects. The findings of our study reflected that after using the online problem reporting system implemented, reporting the problems related to the unit becomes easier, practical and faster. The positive contribution of the faster problem solutions and increased success of LHCM practices also enabled increased employee satisfaction (Bowe 2018).

II.Problem solving

The analysis of the cumulative results of the answers related to the change in the opinion of employees about the problem solving after implementation of lean principles revealed that the positive perception employees were significantly increased as examined by questions 4, 10, 11. The change in positive results were 3.54 ± 0.89 vs 4.12 ± 0.92(t=7.64), 3.62 ± 0.84 vs 3.83 ± 0.77(t=3.11), 3.23 ± 1.04 vs 4.19 ± 0.69 (t=12.96), Table 4).

In the study conducted by Gemmel et al., it has been shown that LHCM practices cause positive changes in the problem solving ability of working staff (Papadopoulas,2011). Poksinska and colleagues examined three hospitals in terms of effects of lean health practices; they reported that, if the employee were given the responsibility of detection of the unit problems and recommendation of the solutions of those problems in addition to their daily duties, the personnel's perception of the problem solving changes positively. These changes support the urgency of new practical solution ideas (Drotz, 2014). The results of our study showed that LHCM practices positively affect the participation and perceptions of employees in the problem solving process.

III. Flow orientation

The analysis of the cumulative results of the answers related to the changes in the opinion of employees about the value perception (flow orientation) after

implementation of lean principles revealed that the positive perception of employees were significantly increased as examined by questions 5,21,30,31,37,38,41 respectively: 4.05 ± 0.934 vs 4.38 ± 0.608(t=4.99), 3.47 ± 0.873 vs 3.76 ± 0.892(t=3.92), 3.66 ± 0.812 vs 2.39 ± 1.228 (t=14.54), 3.84 ± 0.781 vs 4.00 ± 0.779 (t=2.44), 3.42 ± 0.951 vs 3.70 ± 1.022 (t=3.38) 3.56 ± 0.856 vs 3.90 ± 0.864 (t=4.71), 3.54 ± 0.869 vs 3.75 ± 0.857 (t=2.90) Table 5).

With the reorganization of the value flow, both physicians and other personnel have been shown to be more dominant and dependent on their work (Gemmel, 2019). Similarly, our study showed that the implementation of lean health practices positively affects the perceptions of the staff about the value flow and their opinion.

IV. Self managed teams

Making the same small part of the job/work every day in a repetitive manner may hinder the development of a functional personality of employee. During reaching the end of a job, the employee feels a sense of being beneficial and successful at each step of the work (Mazzocato,2012, Roy,2018, Hutton,2018). As member of a team everybody produces all steps of the job. At the same time by self managed team style, it is also possible to detect the errors and delays during work and it is easier to solve (Johannessen, 2018). In our study, the answers of the questions numbered 9,14,34,35 and 47 related to functioning of the employees as individual teams after LHCM practices are examined. Results revealed that opinion of employee was changed positively 3.56 ± 0.89 vs 3.79 ± 0.93(t=3.01), 3.53 ± 0.84 vs 3.74 ± 0.85 (t=2.96), 3.15 ± 1.14 vs 3.58 ± 1.05 (t=4.68), 3.85 ± 0.951 vs 3.68 ± 0.84 (t=2.64), 3.68 ± 0.84 vs 3.94 ± 0.84 (t=3.69), Table 6).

V.Visual control

When the answers given to the questions 12(negative impression decreased to 2.88 ± 0.54 from 3.32 ± 0.41 (t=10.94) and and 27 increased to 4.38 ± 0.92 from 3.6 ± 0.84 (t=10.55), meaning that employees' comprehension

about visual control was significantly changed (Table 7). Quality checks failure in daily work can be detected and recorded faster by using visual control. The results of the changes in thoughts of our employees support this finding.

VI.Brief meetings

When the analysis of the answers given to the questions 1, 15, 24, 28, 48 are examined before and following implementation the lean health applications in the hospital, it was detected that employees' comprehension about brief meetings got significantly better 2.97 ± 0.92 vs 3.73 ± 0.73(t=10.91), 3.56 ± 0.85 vs 3.74 ± 0.81 (t=2.58), 3.6 ± 0.84 vs 4.38 ± 0.92 (t=10.55), 3.66 ± 0.79 vs 3.83 ± 0.84 (t=2.48), (Table 8).

Valsangkar et al. stated in their research that having a rapid information exchange by holding meetings among the hospital departments, identifying the shortcomings of the flow system in practice and putting the suggestions about a solution into action in a shorter time has helped to increase satisfaction of the patient (Hung, 2017). In a similar application, it was stated that holding brief meetings to solve the problems identified by Monroe Wise et al. from Kenya, increased the performance and contributed to the solutions of the reported problems by sharing the results with the employees (Valsangkar, 2017). In a research performed in Ontario, it was stated that informing the employees about lean health applications by other communication methods (such as emails, texts, etc.) is sometimes more suitable.

VII.Standardized work

By standardizing multi-step health processes, variation can be minimized or even eliminated and the quality can be improved. The answers given to the questions 13, 26, 42, 43 after the lean health applications in our research were examined and we detected that employees' comprehension of standardization (standart work) got significantly better 3.42 ± 0.918 vs 3.67 ± 0.753(t=3.55), 3.56 ± 0.875 vs 3.77 ± 0.896 (t=2.83), 3.56 ± 0.875 vs 3.77 ±

0.896 (t=2. 83), 3.55 ± 0.802 vs 3.72 ± 0.861 (t=2.43),), 3.54 ± 0.909 vs 3.82 ± 0.898 (t=3.69), (Table 9).

When Kruskal et al. examined the effects of the lean health applications in the Radiology department, they stated that they received similarly positive results (Rotteau, 2015).

VIII.Coaching

To increase the participation in work, the managers started to pass the responsibility of daily management of activities to individual employees and teams gradually. They focused on empowering employees to take control of their work process and involving them in improvement activities. When the answers related to coaching 3,8(negative impression) and 16) after lean health applications in our hospital analyzed, it was detected that employees' comprehension of coaching changed 3.60 ± 0.800 vs 3.66 ± 0.816 (t=0.88) 3.56 ± 0.883 vs 3.07 ± 0.945 (t=6.38), 3.43 ± 0.926 vs 3.79 ± 0.943 (t=4.59), (Table 10).

This finding showed that the employees got positively affected from lean health applications in this subject, and also showed that the health services would eventually be patient-oriented and highly-qualified at the end of this process (Andersen,2014, Womack,2005, Shah,2007, Aij,2017, Braaten,2007, Abdullah,2008)

IX.Supporting leadership style

Percentage of the positive answers to questions 25, 40 and 45 asked in the research were prepared to check opinion of the employees' about the lean practice namely supporting leadership style; which was increased significantly after implementation 3.42 ± 0.85 vs 3.66 ± 0.87 (t=3.33), 3.48 ± 0.88 vs 3.69 ± 0.88 (t=2.84), 3.49 ± 0.93 vs 3.84 ± 0.88 (t=4.61), (Table 11). This finding showed that the employees were positively affected from the lean health application about leadership.

The changing of leadership as a result of lean health applications caused to increase in the quality of health services and to create a positive environment

(Andersen,2014, Womack,2005, Shah,2007, Aij,2017, Braaten,2007, Abdullah,2008).

X.5S:Seiri, Seiton, Seiro, Seiketsu, Shitsuke

Analysis of percentage of the positive answers to questions 6, 7, 18, 19, 20, 22, 23, 29, 32, 37, 44, 46 revealed that; opinion of employees' about 5 S(sorting (Seiri), organizing (Seiton), cleaning(Seiro), standardizing(Seiketsu) and inner discipline(Shitsuke) got significantly better after lean health application implementation, respectively as follows; (3.59 ± 0.806 vs 3.73 ± 0.854 (t=2.01), 3.62 ± 0.973 vs 3.83 ± 0.903 (t=2.67), 3.40 ± 0.926 vs 3.95 ± 0.943 (t=7.34), 3.48 ± 0.818 vs 3.89 ± 0.909 (t=5.65), 3.54 ± 0.831 vs 3.84 ± 0.936 (t=4.04), 3.2 ± 0.957 vs 2.86 ± 0.979 (t=4.19), 3.39 ± 0.851 vs 3.78 ± 0.892 (t=5.33), 3.45 ± 0.792 vs 2.47 ± 0.797 (t=14.70) (22:negative impression), 3.69 ± 1.006 vs 4.08 ± 0.832 (t=5.03), 3.53 ± 0.88 vs 3.74 ± 0.89 (t=2.83), 3.57 ± 0.879 vs 3.78 ± 0.797 (t=2.98), 3.55 ± 0.89 vs 3.94 ± 0.84 (t=5.37), (Table 12).

5.1.3. Covid 19 and Lean Health Management and Supply Chain Implementation Interaction

It is extremely important that lean principles are applied so that healthcare institutions can manage and sustain crises arising from uncertainties by gaining the flexibility to adapt to rapidly changing market conditions. In our study, it was seen that lean management practices described with many examples had positive effects on organizational structure. Especially the virus outbreak that occurred on December 1, 2019 in Vuhan, the capital of China's Hubei region. It has again shown the world how important health services and health institutions are with the covid process that has spread all over the world in various patients without a specific cause. With the Covid process, lean transformation efforts have come to the forefront in order to restructure the service and supply chain activity structures of health institutions that want to adapt to new conditions.

With the Covıd process, short meetings were digitized. Zomm and other similar communication channels and administrative decisions were communicated to all departments at the same time, which was seen as an advantage in practice. Organizational agility was achieved with whatsap communication organized like this. In this context, patient satisfaction and service agility were ensured by obtaining the instant approval of the fixture and field demand needed in the covıd service processes, which require the written approval of 170 managements to be implemented by submitting the hospital to the written approval of the senior management.

However, in order to remove the requirement of administrative staff to be in the hospital environment during the covid process, vpn report application was given to the use of human resources department and administrative staff's work from home application was introduced. In this way, 45 personnel in the medical billing service were ensured to work from home continuously. However, since 2 personnel service vehicle services are not required, monthly savings are achieved.

Telehealth services were started to minimize the risk of transmission during the covid process. In this way, health services were provided to 1245 patients on a monthly basis without coming to the physical area of the hospital, preventing both hospital staff and patients from contracting the virus.

Although the use of people's handwritten signatures as an authentication tool is based on a longstanding practice, it is quite new to do so digitally. However, financial institutions, businesses and public institutions that use wet signatures extensively have been reported to be at serious risk of infection transmission. When working in offices prior to the COVID-19 pandemic, it was a general practice to physically or wetly sign documents for the processing of approval mechanisms in an environment where everyone was together. Approximately 150 outpatient units and more than 100 services were officially signed at the hospital. In the process that begins with the signing of the wet signature, when the flow chart of the documents is taken into account, the necessity of actually moving the document and obtaining

approval from different units creates the necessity of face-to-face interviews. This also means that infections transmitted through droplets can especially find COVID 19.

As with businesses that perform digital transformation within lean management applications, taking the step of using electronic and mobile signatures, which means digitizing approval processes, is an inevitable part of lean transformation. From the beginning of the pandemic process, there are numerous examples that show that it is no longer possible for continuous processing of workflows that work with wet signatures and face-to-face interviews. During the pandemic process, the digitalization of approval processes and signatures has become a more important issue as employees start working remotely from their homes, while spreading digitalization to all businesses in an incredible way. However, in order for the aforementioned digital system to be implemented, the digital infrastructure must also be created and functioning. The digital infrastructure created thanks to lean management applications was realized just before the COVID 19 Pandemic process, so it also contributed as a readyness for the pandemic process management.

In addition to the contributions of lean management practices in the entire hospital management and supply chain, such as time, cost, etc. regarding leanness in the hospital, the fact that hospital staff can perform transactions without face-to-face has also revealed a very important lean management contribution: the possibility of infection prevention. In this way, it is possible to say that approximately 15000 face-to-face interviews in which hospital staff have a risk of COVID-19 infection have been eliminated, and that the number of hospital staff who have COVID-19 infections can be reduced by almost 90% compared to a equivalent hospital that has not been digitized by lean management when compared to the total staff of the hospital. The protection of the personnel from infection has also enabled the full treatment of our patients by using all beds in the most efficient way thanks to the protection of their families and the service can be provided without interruption during the very important epidemic process.

CHAPTER VI

RESULTS AND RECOMMENDATIONS

6.1.Results

The results of this research showed that the implementation of lean health management and supply chain application in a large-scale hospital in our country causes the management scheme to go from vertical to horizontal.

It has been observed that one-year application time is sufficient for the effects of one-year lean health management and supply chain implementation to emerge, and its positive effects are clearly revealed.

It has been observed that medinat software application, which can be active online problem tracking, increases the value flow speed and efficiency.

As a result of the subunit assessments of lean health and supply chain application, the following results were obtained: Patient flows have improved. the duration of diagnosis and treatment has accelerated and capacity utilization efficiency has increased.

Costs have been reduced. Waste of time and materials has decreased. The amount of internal waste has decreased. The patient's diagnostic test results and the waiting time during prescription writing times decreased.

It has led to a significant increase in the perception and satisfaction of staff, who have an important place in the hospital service of each subheading of lean health and supply chain application, and has made the staff feel good

and happy in the working environment. The perception of the staff has also improved significantly in a positive direction as a result of a year's process, and participation rates have increased, which has increased satisfaction. Processes and vehicles used have been standardized, monitoring and counting operations have accelerated and comparative analysis is allowed by registering.

As a result of these applications, the personnel are encouraged to participate in all processes of health care and communication channels are always kept open.

Despite the complexity of providing health care, lean practices make the service centered on patients and safety in a well-organized health care business. By reducing all kinds of wasted time and materials to zero, it increases efficiency and paves the way for providing the highest quality service on time. In addition, "lean practice" contributes to the long-term operation of the business by increasing the morale of employees and improving the sense of ownership. In summary, it was determined that all of the hypothetic suggestions accepted at the beginning of the research were provided.

6.2. Suggestions

The results of this research revealed the necessity of applying lean health and supply chain in businesses serving in the health sector.

Plans can be made by predicting that the implementation of lean health and supply chain implementation in all hospitals, including large hospitals, will positively affect the structure of the organization and the perception of staff.

In order for these applications to be implemented, a preliminary evaluation of the business must be carried out and value flow controls should be carried out and after the disruptive aspects are identified, we should go to these areas with more specific solutions and lean implementation.

Lean management approach is an approach that can change the management organization and management style of health institutions, allow institutions to improve patient service quality by reducing errors and waiting times, and eliminate barriers to harvest-oriented service flow by supporting staff and senior management.

With the acceptance that employees are the most important part of the lean application process, applications should be switched after giving the necessary training to the staff.

To ensure communication with employees, it would be appropriate to make a quick communication network using software that everyone can reach instantly if needed.

Lean health and supply chain application minimized with the highest working efficiency, reduced cost and zero waste, all risks prevented by preventing employees from participating in the process, completely prevented work accidents, minimized breakdown with regular and routine technical care, zero waste or inefficient service with ever-increasing quality, zero complaint with greater confidence, and a constantly growing health care business where all employees and patients have more respect and confidence.

After the starting of lean applications, both the organizational structure and the perception of personnel are periodically subjected to controls and the disruptive aspects, analysis of all-oriented efficiency will be an example for other businesses and will contribute to the expansion of the application.

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Appendix 1.Data Collection Form

THE EFFECTS OF LEAN MANAGEMENT PRACTICES IN THE HEALTHCARE SECTOR AND SUPPLY CHAIN ACTIVITIES ON ORGANIZATIONAL STRUCTURE

To whom it May concern;

Completion of my PhD thesis on “The Effects of Lean Management Practices in Health Sector and Supply Chain Activities on Organizational Structure” that I am preparing; It will be possible with your valuable contribution by filling out the attached questionnaire. Your sensitivity when filling out this form; While increasing the success of the study, it will enable you to have a share in the contribution to be created for both science and the business world.

This survey is not intended to test you. The expressions used do not have true or false equivalents. The important thing for us is that you state your true thoughts when you fill out the form. Also; The identity information of the persons or businesses that fill out this form will not be obtained and no names will be mentioned in any way about the participants in our survey. We would like to thank you for your interest in our work.

Assoc. Dr. Nermin GURHAN **Gazi University Faculty of Health Sciences** **Faculty Member**	**İsmail HIZLI** **K.K.T.C. Near East University** **Department of Business Administration** **Doctorate Student**

Answer the following questions according to the degree of participation.
Strongly Disagree: 1;
Disagree: 2;
Neither Agree nor Disagree: 3
I agree: 4;
Strongly Agree: 5.

1- Lean Management Data Collection Form

No	Variables	Strongly Disagree	Disagree	Neither Disagree Neither Agree	Agreee	Strongly Agree
1	We receive sufficient training to achieve quality in my institution.	1	2	3	4	5

2	My institution is in a constant effort to achieve quality.	1	2	3	4	5
3	As employees of the institution, necessary efforts are made to ensure that we participate in management decisions and are informed.	1	2	3	4	5
4	It is ensured that our opinions about the problems encountered in my institution are received through questionnaires, direct communication or other methods.	1	2	3	4	5
5	While performing my duties in the institution, we pay attention to simplicity and simplicity in our activities.	1	2	3	4	5
6	Our working environment in our institution is in accordance with the working conditions in terms of simplicity and simplicity. (Physical time losses, transportation and storage of materials are for your easy use.).	1	2	3	4	5
7	If my workplace is organized with the simplicity and simplicity I physically desire, more time gain will be provided.	1	2	3	4	5
8	Due to the intensity of daily tasks, I cannot find the opportunity to improve myself in my field.	1	2	3	4	5
9	Learning other business branches in addition to your main business branch will reduce your business monotony.	1	2	3	4	5
10	There is a common language in my institution to which we can apply to solve the causes of problems.	1	2	3	4	5
11	Research is carried out until the real cause of the problems that occur during the performance of my duty is found and a permanent solution is produced.	1	2	3	4	5
12	Errors occur due to the lack of quality control in problems encountered outside of my control while performing my duty in my institution.	1	2	3	4	5
13	The work done in my institution is seen in transparency.	1	2	3	4	5
14	My institution exhibits an approach in its activities with an understanding of team spirit.	1	2	3	4	5
15	There is a direct and healthy communication in my institution.	1	2	3	4	5

16	Authorities and responsibilities are properly distributed in my institution.	1	2	3	4	5
17	My institution responds to technological developments in a short time and changes.	1	2	3	4	5
18	Assuming that there is no military discipline in your institution; There is a complete business discipline in my institution.	1	2	3	4	5
19	Simplicity is at the forefront in the methods applied for the execution of the duties in my institution.	1	2	3	4	5
20	There are physical regulations in my institution for the shortest and fastest completion of business and transactions.	1	2	3	4	5
21	To reach the department related to quality control and quality assurance in my institution; it is practical and away from bureaucratic procedures.	1	2	3	4	5
22	The inspections carried out during the execution of the task in my institution are in a scale that disrupts my work.	1	2	3	4	5
23	There is a continuous research and improvement in my institution to remove unnecessary work and processes from work programs.	1	2	3	4	5
24	Meetings are held in my institution where there is no subordinate-superior relationship and the problems are discussed mutually.	1	2	3	4	5
25	In my institution, subordinates are given decision-making authority and responsibility for their work.	1	2	3	4	5
26	The works that are being done in my institution other than the main works, are benefited from the institutions or companies that are specialized in their field. (food, transportation, material storage, security, cleaning, education, driving, etc.).	1	2	3	4	5
27	When faced with problems and failures in daily work programs, the process of certification and recording is done in full.	1	2	3	4	5
28	Daily, monthly and annual plans are made in other units in my institution that are related or not related to my job. Thanks to these plans, statistical information is kept up to	1	2	3	4	5

	date.					
29	There are unnecessary, repetitive jobs in my institution and it negatively affects my productivity.	1	2	3	4	5
30	In my institution, there is an effort to minimize the waiting times of the employees during the work.	1	2	3	4	5
31	The service and task produced in my institution significantly meets the expectations of other users.	1	2	3	4	5
32	A job description is made about the work done or the service produced in my institution.	1	2	3	4	5
33	During the performance of the tasks in my institution, the pursuit of excellence is required without any individual supervision.	1	2	3	4	5
34	During my duty and service in my institution, only mistakes that I have produced occur.	1	2	3	4	5
35	I strive for excellence in the performance of my duties in my institution without any need for individual supervision.	1	2	3	4	5
36	During my duty and service in my institution, only mistakes that I have produced occur.	1	2	3	4	5
37	In my institution, material flow is done on time with the request from the sub-units.	1	2	3	4	5
38	In my institution, emphasis is placed on frugality in the use of resources.	1	2	3	4	5
39	All resources are used effectively in my institution.	1	2	3	4	5
40	There are activities in my institution for continuous improvement.	1	2	3	4	5
41	The level of benefiting from experienced personnel in the field of continuous improvement is high.	1	2	3	4	5
42	There is an additional effort from the employees in order to get quick results regarding the work and processes performed.	1	2	3	4	5
43	In my institution, information is given about what the ideal conditions are.	1	2	3	4	5
44	My institution has a habit of using checklists for standard	1	2	3	4	5

	work methods.					
45	There are continuous review activities regarding the work done and new issues in my institution.	1	2	3	4	5
46	While there is institutional change and development, I am motivated and encouraged in my department as required.	1	2	3	4	5
47	The resources available in my institution are well managed.	1	2	3	4	5
48	I know enough about my institution and its culture.	1	2	3	4	5
49	In my institution, adequate plans are made to foresee the future.	1	2	3	4	5

2- Supply Chain Management Data Collection Form

No	Variables	Strongly Disagree	Disagree	Neither Disagree Neither Disagree	Agree	Strobgly agree
1	Our relations with suppliers are long-term and we have a permanent relationship.	1	2	3	4	5
2	Suppliers are invited to strategic planning.	1	2	3	4	5
3	We ensure the participation of important suppliers in our planning and goal setting activities.	1	2	3	4	5
4	Common goals and strategies are determined with the suppliers.	1	2	3	4	5
5	Information communication is established at various levels with the suppliers.	1	2	3	4	5
6	Information sharing between us and the suppliers is done in a timely manner.	1	2	3	4	5
7	The information exchanged with our suppliers is correct.	1	2	3	4	5
8	The exchange of information between us and the suppliers is complete and reliable.	1	2	3	4	5
9	Feedback on product and customer service is provided.	1	2	3	4	5
10	We try to establish close relationships with our customers.	1	2	3	4	5
11	We frequently measure and evaluate customer satisfaction.	1	2	3	4	5
12	Thanks to the information and communication technologies we use in our relations with suppliers, customer feedback is answered quickly.	1	2	3	4	5
13	Suppliers are involved in company-related cost reduction programs.	1	2	3	4	5
14	Carriers are included in cost reduction programs implemented to reduce the total delivery cost of the supplied product.	1	2	3	4	5

15	We are successful in our purchasing activities.	1	2	3	4	5
16	We examine the market movements in order to make an effective purchase.	1	2	3	4	5
17	We carry out storage activities in a planned manner.	1	2	3	4	5
18	Our stocks are stored in suitable places in our supply chain network.	1	2	3	4	5
19	Our products are stored under suitable storage conditions.	1	2	3	4	5
20	We consider economy in storage activities.	1	2	3	4	5
21	We reduce the time to respond to needs.	1	2	3	4	5
22	Contracts containing penal provisions for service faults have been made with suppliers.	1	2	3	4	5
23	We make the necessary planning to avoid delay in orders.	1	2	3	4	5
24	We strive to respond promptly to orders.	1	2	3	4	5
25	We achieve better customer relationship management with Supply Chain Management (SCM) activities.	1	2	3	4	5
26	With SCM activities, we achieve more effective information sharing.	1	2	3	4	5
27	We provide more effective strategic supplier partnerships with SCM activities.	1	2	3	4	5
28	With SCM activities, we carry out purchasing activities more effectively.	1	2	3	4	5
29	We carry out storage activities more effectively with SCM activities.	1	2	3	4	5
30	We carry out storage activities more effectively with SCM activities.	1	2	3	4	5

3- Gender:

( ) Woman **( )** Man

4- Your marital status:

( ) Single **( )** Divorced **( )** Married

5- Your Education Level:

( ) Secondary School-High School
( ) Associate degree ( ) Bachelor degree
( ) Master degree ( ) Doctorate

6-Age:

7- Total Service Time in Your Profession:

( ) 1-3 Year ( ) 4-7 Year
( ) 8-11 Year ( ) 12 Year and more

8Your Service Period at this Institution:

( ) 1-3 Year ( ) 4-7 Year
( ) 8-11 Year ( ) 12 Year and more

9- Unit You Work:

( ) ( )
( ) ( )

10- Your Position at Your Workplace (Your Position)):

( ) Employee (Employee)
( ) Chief / Manager

Thank you for your valuable contribution to the research by sparing your precious time and filling out our questionnaire, success in your work.

CURRICULUM VITAE

İsmail HIZLI was born in Balikesir in 1979.

After completing his primary and secondary education in the center of Balıkesir, he completed his high school education in Ankara. İsmail HIZLI received his bachelor's degree from Selcuk University, Karaman Faculty of Economics and Administrative Sciences, Department of Business Administration. After completing his MBA in Istanbul Okan University, he started his doctorate in Business Management at Near East University. He made a publication titled “Change in staff perception of lean health practices after initiating lean implementation” regarding his doctoral thesis. HIZLI, who has 21 years of managerial experience in the health sector, has experience in foundation Hospital, private sector and university hospital management.

He still continues his duty as Purchasing and Supply Chain Director in Istanbul Medipol Health Group. He has been a speaker at many national and international symposiums, and he is the Vice President of Turkish Purchasing and Supply Management Association (TUSMOD).

He took an active role in the establishment phase of many hospitals operating in Turkey.

He has management consultancy experience for international companies operating in Turkey.

He provides leadership and coaching, strategic purchasing and budget management, reporting and presentation training at the lifelong education center of Istanbul Boğaziçi University. He teaches financial management at Istanbul Medipol University, Department of Health Management.

İsmail HIZLI is married and has 2 children.

PLAGIARISM REPORT

SAĞLIK SEKTÖRÜNDE YALIN YÖNETİM UYGULAMALARI VE TEDARİK ZİNCİRİ FAALİYETLERİNİN

ORİJİNALLİK RAPORU

%15	%10	%1	%9
BENZERLİK ENDEKSİ	İNTERNET KAYNAKLARI	YAYINLAR	ÖĞRENCİ ÖDEVLERİ

BİRİNCİL KAYNAKLAR

1	Submitted to Beykent Universitesi Öğrenci Ödevi	%5
2	dijitalhemsire.net İnternet Kaynağı	%1
3	Submitted to Galatasaray University Öğrenci Ödevi	%1
4	bmchealthservres.biomedcentral.com İnternet Kaynağı	%1
5	www.revistaclinicapsicologica.com İnternet Kaynağı	%1
6	saysad.org İnternet Kaynağı	%1
7	www.pressacademia.org İnternet Kaynağı	%1
8	www.e-adliye.net İnternet Kaynağı	%1
9	www.researchgate.net İnternet Kaynağı	%1

ETHICS COMMITTEE REPORT

YAKIN DOĞU ÜNİVERSİTESİ

BİLİMSEL ARAŞTIRMALAR ETİK KURULU

29.08.2017

Sayın Doç. Dr. Nermin Gürhan,

Bilimsel Araştırmalar Etik Kurulu'na yapmış olduğunuz YDÜ/SB/2017/40 proje numaralı ve **"Sağlık Sektöründe Yalın Yönetim Uygulamaları ve Tedarik Zinciri Faaliyetlerinin Örgütsel Yapı Üzerinde Etkileri"** başlıklı proje önerisi kurulumuzca değerlendirilmiş olup, etik olarak uygun bulunmuştur. Bu yazı ile birlikte, başvuru formunuzda belirttiğiniz bilgilerin dışına çıkmamak suretiyle araştırmaya başlayabilirsiniz.

Yardımcı Doçent Doktor Direnç Kanol

Bilimsel Araştırmalar Etik Kurulu Raportörü

Direnç Kanol