IMPROVING STOCK MANAGEMENT IN HEALTHCARES TO INCREASE EFFICIENCY

VERİMLİLİĞİ ARTIRMAK İÇİN SAĞLIK KURUMLARINDA STOK YÖNETİMİNİN GELİŞTİRİLMESİ

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Abstract

Purpose: Traditional hospital management focuses on stock control and orders system based on cost, time and image of hospital. Many patients cannot get effective treatment due to lack of quality in services and lack of medicines in healthcares. The main purpose of the article is to find reasons behind lack of efficiency in healthcare services in 8 big hospitals in the province of Erzurum.

Design/methodology/approach: The method is used in this article to analyze the system of hospitals located in the province of Erzurum, eastern part of Turkey by asking open questions with some options. Forms were filled by top management of hospitals.

Findings: It is found that they mainly depend on government policies and have low efficiency and high regulatory stock level. Moreover, there is a big bureaucracy in all operations found as the biggest obstacle behind lack of efficiency.

Research limitations/implications: This work can be generalized by comparing hospitals in different part of Turkey.

Originality/value: This paper brings beneficial results to see the profiles and problems of hospitals located in the province of Erzurum and analyze their last 5 years.

Keywords: Efficiency, Item Tracking/Monitoring, Inventory Management, Supply Chain Management, Healthcare, Erzurum.

Öz

Amaç: Geleneksel hastane yönetimi fiyat, zaman ve hastanenin imajını esas alan stok kontrolü ve siparişlere odaklanmaktadır. Birçok hasta ilaç eksikliği, düşük kalite gibi nedenlerden dolayı etkili sağlık hizmeti alamamaktadır. Bu çalışmanın temel amacı sağlık hizmetlerinde verimliliği düşüren sebepleri tespit etmektir.

Yöntem: Veriler, Erzurum'da faaliyet gösteren 8 hastanedeki üst düzey yöneticilerden elde edilmiştir.

Bulgular: Hastaneler büyük oranda resmi politikalara bağlı olarak faaliyetlerini sürdürmektedirler. Verimlilik düzeyleri düşük olarak bulunmuştur. Stok düzeyinin istikrarlılığı ise yüksektir. Tüm faaliyetlere etki eden aşırı bürokrasi, verimlilik düzeyinin düşük olmasındaki en büyük sebep olarak tespit edilmiştir.

Sınırlılıklar: Bu çalışmanın bulguları Erzurum'daki 8 hastane ile sınırlıdır. Türkiye'nin başka hastanelerinden elde edilecek bulguların bunlarla karşılaştırılması ile daha genel sonuçlara ulaşılabilir.

Çalışmanın özgünlüğü/önemi: Bu çalışma, araştırma yapılan hastanelerin birer profilini ortaya koymakta, problemlerini açığa çıkarmakta ve son 5 yıllarını incelemektedir.

Anahtar Kelimeler: Verimlilik, Stok İzleme/Kontrol, Envanter Yönetimi, Tedarik Zinciri Yönetimi, Sağlık, Erzurum.

Introduction

Technological improvements increase the efficiency of stock management. Stock controlling is carried out just in shelves of units and storage in hospital or at central warehouse. Hospitals are afraid of being out of stocks. Thus, they try to order in huge quantities. Governments are ready to pay the cost of these medicines. Hence, hospitals really do not care for costs in public hospitals. There can be a new regulation in stock management of hospitals. All medicines can be followed and controlled by state of art technologies. RFID (Radio Frequency Identification) technologies are the core of these technologies. Barcode control systems in all hospitals will know where each medicine and can give information about the due dates. Each medicine can have a registered name and controlled until it is used by persons.

Stock management is a critical part of health care management to decrease costs and increase efficiency. Medicine industry is different from manufacturing industry. Medicines are supplementary part of human life. Many medicines are very expensive and rare. Stock controlling, safety stock, sorting medicines and Just-In-Time (JIT) are all that can be considered and applied healthcares. How to supply medicines at right quantity and at right time is a part of increasing efficiency in hospitals. The next steps of stock controlling are also very crucial. Some medicines are needed to be stored in special places such as refrigerators to control humidity and temperature. Some medicines lose their properties under mal conditions. Some medicines pass their due dates and then they are discarded or used.

In Turkey, stock management is not well organized. Medicines are supplied by governments mainly and health workers do not care much about the usage of medicine stocks. They are mainly ordered in excess and stay in the warehouse of hospitals for long time (3 months or more). Private hospitals are partly connected to governments and they provided

services to public under some conditions. When you go to a private hospital, then you get some unnecessary tests and medicines. Then, they will get the payment of these from government. Private hospitals are caring just to increase to their profit. There is a great cost due stocks on governments. The situation of health care system is different now in Turkey. Private sector is also included in government system but it brings more costs.

Another question is the quality and right treatments of doctors. When the first writer of this article worked in hospitals he noticed some situations and states like that: "Doctors write standard prescription even some of patients are not so bad. Many not needed medicines are used to end up some small infections. As ill person with the same illness came to the hospital he was written the same medicines all time and one core medicine was used completely by this ill person but the other medicine was not completely used since the cost of medicine to that person was not so high and he really did not mind what the doctor wrote and he put excess ones into the refrigerator each time at his home." As seen from this example, efficiency is low in hospitals. To increase the efficiency in healthcare, the written or used medicines should be also controlled. A new supply chain should be established until the last part of medicine is used. Recapturing system should be established to decrease the waste of medicine usage. A right stock consumption strategy should be established. He shares another experiment like that: "I did my internship in the laboratory of a hospital in Istanbul in 2000, one of the main machines of laboratory was broken down and more than 100 blood tests could not be carried out. There was not an alternative machine and many of these tests were carried out at outside with expense of patience. When I consider the inefficiency of that hospital, even the estimated cost of just this machine is more than ₺ 10,000 since 2 health persons did nothing the whole night, patience were sent outside and some of them could not carry the tests and waited for the machine to be repaired. Even, some tests of critical persons were not able to be carried out. At the end, it was understood that technician made some mistakes while using the machine. Actually, it was a government hospital and everybody forgot everything early in the morning."

Two important determinates in health sector in Turkey are services and stock oriented architecture. The efficiency depends on both of them mainly. In this article, we tried to see the efficiency and stock management in hospitals. The province is in the East of Turkey and has around 23 different hospitals. In this study eight well known hospitals were analyzed in Erzurum. The structure and properties of each hospital are close to each other since they are mainly government hospitals but their core operations are different. To see the importance of efficiency and their stocks, open and multi options questions were answered by a person from top management of hospitals with help of other workers from their hospital. Later, these hospitals were compared to find differences and common parts. The size and personals of each hospital are big enough to be analyzed and to be a sample of the province.

Theoretical Background

Each healthcare has its own structure and routines, thus its bureaucracy and whole system should be analyzed separately to determine the dominant factors. Different from industry, a lack of medicine or product in a hospital is substituted by another one with different quality and specifications in a broader manner. Stock management is controlling and providing necessary materials to the hospital. Hospitals prefer to make huge amount of stock to prevent any unexpected situation, but this strategy requires more money and efforts [9]. Every hospital has its own supply chain but the general one is shown in Figure1.As seen in the Figure 1, *when*, *which products* and *who* are questions helping to optimize the supply chain. When the

workers should control, visit and replenish inventories, when they should put order, what is reorder point for each product, and how stock-outs can be prevented are core questions in efficient hospital management. A hospital specific optimization schedule and model can be improved to decrease costs and increase efficiency [10]. Hospitals in Erzurum have almost the same supply chain as shown in Figure 1 while not considering their specific requirements and geographical location, but in general the logic of chain is divided among Central Warehouse (CS), suppliers, and Central Units (CU).
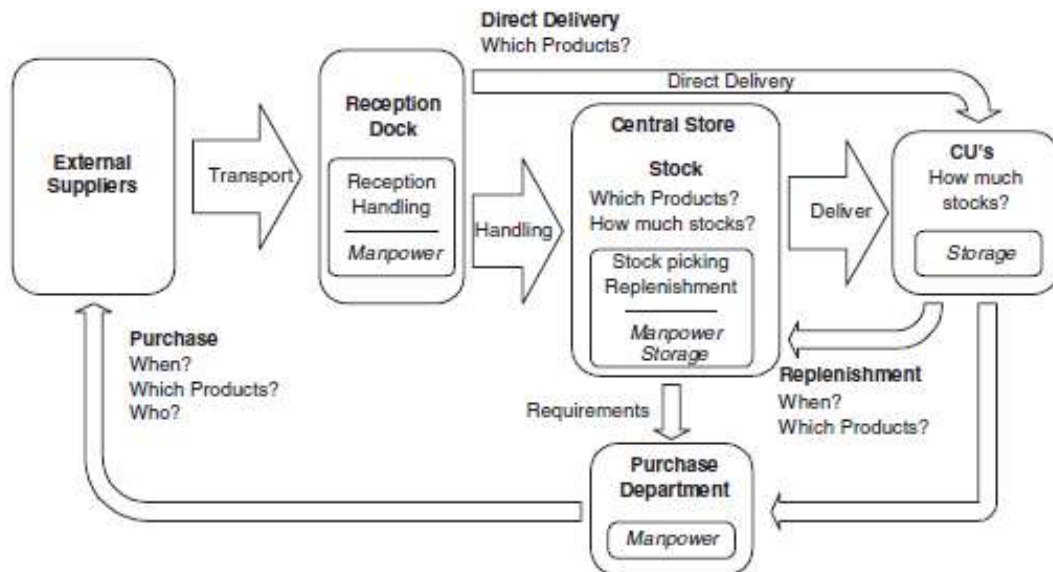

Figure 1. Key decisions for the hospital supply chain [1]

In healthcares, there are lacks of visibility of low utilization rates, purchasing of medicines, inefficient staff time, loss of machines usage time, thefts, excess of prescriptions, not keeping enough stocks etc. Moreover, searching equipments needed and not maintaining machines decrease the efficiency. RFID technology can be used in hospitals to increase efficiency and saving cost. It improves data management and provides relevant information on time. All parties in chain can reach and use this data for their purposes [2]. It is found that RFID is better than barcode system and periodic reviewing in decreasing costs and watching inventories continuously. RFID is more efficient than manual counting for barcodes. The counting costs can be subtracted from RFID technology. RFID provides more advantages in backorders meaning high service levels, high demand rates, high uncertainty levels, high shrinkage rates, and long lead times.

It was found for the radiology practice that total costs by 76% can be decreasing through switching RFID and redesigning processes. An improved data tracking and decreasing in errors are other advantages of RFID over other methods [3]. Another way to increase efficiency in hospitals is to create an online web-based system that can be seen by everyone in the hospital. Moreover, there should be a team controlling and developing the knowledge system in the hospital. One drawback of knowledge systems that the hospital need to make investment and may need to hire technical staff needing to work with hospital persons. In many hospitals, persons use online emails and other ways to communicate and this prevents to adopt a new system. The need of this system is overlooked in many hospitals. To increase the quality and celebrative work, decision support system with sophisticated computer-based tools will help the hospital persons [4].

Make to order or make-to stock is cost driven decision for the manufacturer and purchaser. Seeing suppliers stocks by manufacturers can help for better planning. The firm can decrease the effects of uncertainty of demand by hiring fix workforce or using subcontracting options especially for multi demand situations. Capacity increasing options can result in saving of costs by coordinating capacity of production and inventory decisions [5]. The coordination can be enlarged by distributing medicines to each department of hospital by suppliers or central warehouses via direct communication. In this situation, the logistics costs inside the hospital can be decreased. Cost occurring by third parties is less than procurement costs of internal providers while providing nearly the same base service quality and efficiency crucial for decision making of outsourcings. The communication channels should be well developed to free up hospitals personal and let them concentrate on their core services [6]. Inventory management through JIT (Just-In-Time) can be seen as a way of decreasing costs of logistics. Storing medicines is a non-value adding activity. Another way of decreasing costs is to eliminate or diminish not-value added activities, which is named as Activity-Based Management (ABM). Partnership with suppliers and other hospitals will help the hospitals to decrease non-value added activities by economies of scales or joint partnerships. The cooperation between hospitals and suppliers will help to decrease the logistics costs. In the best situation, they may apply JIT philosophy. The management of hospitals also can make cooperation with other hospitals to benchmark and decrease costs [7]. Stocks are categorized according to their value as ABC. A group represents 80% value of stocks monetary even few while C group represents 20 % value of stocks even lots. Thus A group stocks take more attention and C group stocks less attention. Hence, carrying A group stocks can cause more costs due to their high operational costs in hospitals. Medicines for cancer are very important stocks and very expensive. Moreover, it is difficult to find alternatives of these stocks [8]. Thus, categorizing the stocks may result in decreasing costs and increasing efficiency.

The quality philosophy can be applicable to service sectors. The costs of poor services can be more than the costs of not qualified products. In health sector, 'making it right the first time' is very important in critical operations. Human errors can result lives. The quality management in private and public sectors has different acceptance and maturity. In public sector, it is more difficult due to political changes and constraints of getting full commitment of top management. Bureaucratic and hierarchical cultures result in high costs in many hospitals. Private hospitals are more revenue oriented while public hospitals are subsidized by governments. Thus, financial wards may not play an important role in public hospitals. Health sector is different from manufacturing industry by multidimensional costumers and service types. Thus, quality management applications are more difficult [11]. According to OECD statistics in 1996 based on purchasing power parities, the cost per capita in United States is the highest while in Turkey it is very low when compared with other industrialized countries [12]. To raise the quality in Turkey, more budgeted cost should be planned by governments. Health Minister can use its cost to effectively increase the quality of health sector.

Methodology

To analyze the system of hospitals, survey questions were filled by eight main hospitals in Erzurum. Findings are limited to that region and cannot be generalized to the whole country. Question are mainly open questions with some options and aimed to compare hospitals within the province and compare with existing literature and methods to find problems and improve the hospitals systems. It is aimed to extend that study by surveys in order to learn the technology usage of staff and satisfaction of patients. To avoid confusion,

four hospitals are shown in main text and remaining four ones are added to appendix. Each hospital is compared with others and parts of questions are generalized based on their results. Some general results could be gone while there are some specific ones for each.

Results and Discussions

Turkey is geographically different. Thus, these findings are limited to that region. Erzurum is a developed province in the East of Turkey. However, when it is compared with other provinces in the West of Turkey, it has many drawbacks. Even, lots of money is spent in that region, it is difficult to make improvements. The people, existing structure and region dynamics prevent cities to be developed. Although during the last years there are some changes and improvements, there is still a big gap among cities in Turkey. Health sector is not independent from that reality. Actually, when Erzurum is compared with other provinces of east of Turkey such as Ağrı, Bingöl, Erzincan and Muş, it is an attractive province and many people from these cities come for treatment. Transportation problems create big problems to reach that city by neighbor cities. One hospital accepts patience from 12 different cities in that region, which shows the importance of that city in the region. Hospital 8 in Appendix section is a research hospital and makes scientific researches in health sector. It is supported by Atatürk University and expected to be a model hospital for the region. Other cities around Erzurum also need this kind of hospital and may get some benefits from that hospital in terms of scientific improvements and new treatments methods.

Table 1: Comparing hospitals according to main indicators

INDICATOR	Hospital 1	Hospital 2	Hospital 3	Hospital 4
Size	Workers: 179 Beds: 50	Workers: 2,729 (need more academicians) Beds: 980	Workers: 55 Beds: 30	Workers: 327 Beds: 150
Quality	Health Minister Quality Standard Application	Health Minister Quality Standard Application, improving costumer and personal satisfaction	Not clear definition but want to increase the quality	Health Minister Quality Standard Application (Costumer and Personals satisfaction)
Management	Good (Close to problems and like a family)	Not good, deficiencies in organizational hierarchy and control	Good but still new	Experienced Qualified
Bureaucracy	Big obstacle	Problem	Takes time and creates partial problems	Low
Core Operations	General treatments, not specific field	Research and treatments	Emergency and first care hospital as well as short time stays	Births
Image	Technological and comfortable	Improved technology	Moderate technology 6.place in the located region	Technological but the need of integrating radiology devices with visual devices
Ventures	Expected	Campus Health Center	Planning	No
Importance of Personal and Patience	Patience	Personals	Both	Both
Ranking of Pain	No	Available	Five scale ranking (From worst to least one)	Not available
Last 5 Years	Increases in persons and devices	Increase in persons and devices	Increases in persons and devices	Increases in persons and devices
Next 5 Years	Technologically	Big suppliers and	Team working,	Restructuring public

	improved, qualified workers, better graduates from universities	distributors in the region	sufficiency exam of workers, trainings, social improvements, the best in the Erzurum region in next 5 years.	hospitals, new building (planning to build one)

The size of each hospital is very big and each hospital has its system and individual requirements. To manage such big hospitals is not an easy task but mostly the management seems good. One hospital defined that the management is lack of management capabilities. This is a general problem almost in many hospitals in Turkey. Designations and delegations are not done according to capabilities and management vision but by political decisions. The hierarchical problems in management are another drawback related to management as stated by the Hospital 2. They stick to quality requirements of Health Minister and they do not have their own quality philosophy. They define the quality as satisfaction of patience and staff. A service based quality way will help to improve the satisfaction. What the costumers think about the hospital after treatment will give better results to evaluate the quality of each hospital. Patience should be at the head of satisfaction pyramid in hospitals. If a person cannot understand the pain of patience, there is no way to treat him maximally. Even in many hospitals, many patience wait in pain in queues. To increase the satisfaction of patience, hospital staff should be aware of that. In many hospitals, unqualified staff work and but their capabilities can be improved or aided by experienced workers. For that purpose, a good hospital culture should be adopted.

Bureaucracy is defined the worst problem in all hospitals. To fulfill government requirements, hospital have to obey some rules and this decrease efficiency and quality. Technological adaptation may decrease bureaucracy. Even to get a service from another hospital, it takes time. Hospitals try to cooperate with other hospitals to eliminate this problem. Hospitals define themselves as technological mainly and want to improve their technology. Actually, they depend on the technology provided by governments and they do not use any RFID technology or other improved technology. They use second or more generational technologies. Providing such expensive technologies require high costs and education. Barcode system cheaper than RFID is also an efficient system but none hospital mentioned that. Hospitals should concentrate their core field but as it is understood from survey they are not successful much at that. To find qualified staff and personal changes prevent that as stated by two hospitals. Last 5 years have been a stage of improvement in hospitals by buying new devices, adapting some new technological improvements, making new buildings which are a result of political changes and a need of improving health sector. Next 5 years is evaluated by each hospital differently, Hospital 2 expects to enlarge the supply chain in region while finishing existing investments. Other hospitals want to improve their personal workforce and technology. Moreover, Hospital 4 suggests an interesting solution by reconstructing the hospital management. It can be an interesting and beneficial result to reengineer hospitals management according to regional requirements. Hospitals responsibility to cities located should be reorganized by including some important people partly or fully from city units (Chamber, municipality, governorship etc.) in management. Tables designed to compare 8 hospitals can be viewed to compare hospitals.
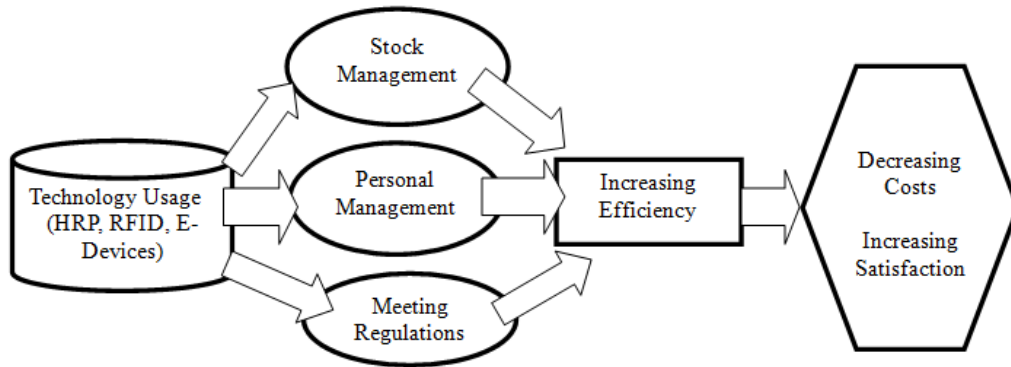
Fig 2: Technology and efficiency relationship

Technology has indirect affect on efficiency increase as shown in Figure 2. Effective personal, stock and regulations triangle can be managed with a well coordinated and controlled by Hospital Resource System integrated with all functions of hospital and remote devices, decreasing costs and increasing efficiency.

Table 2: Efficiency indicators

INDICATOR	Hospital 1	Hospital 2	Hospital 3	Hospital 4
Performance	Cured patience Birth Rate: 98% (Given by HM)	No birth Unit, cured patience	Subjective measurement system inside hospital	Number of births (8368 births) 97% (Subjective grade)
Efficiency Increase	HM Criteria, increased	Each department is responsible from its unit	Increased	Increased
Personal Control	Subjective control	Doctors are graded but others not	Subjective control	Just doctors
Need of Efficiency	High	High, by improving technology and decreasing costs	High, by training	High, by decreasing persons, unnecessary tests and evaluation of other persons besides doctors
Automation System	Standard one used overall (MKYS)	HRP (Hospital Resource Planning)	HBYS System MKYS	MKYS

It is apparently that there is a need to increase efficiency. To increase efficiency, there should be an improved Automation System to control stocks, coordinate activities and performance personals. There are some improved resources planning systems but these hospitals in Erzurum use MKYS (Material Resources Management System of Hospitals), a Turkish program. Actually, it is an improved system and helps the hospitals to meet government requirements. However, improved resource planning system has connection with M-devices, barcode system and RFID technology. Nothing stated about the usage of these technologies in survey. Their main efficiency or performance measures are cured patience, births very subjective to get a result of efficiency in each hospital. They suggested decreasing unnecessary tests, measuring all workers not just doctors, decreasing costs, improving technology and training mainly required things but none done well until now. They have increased their efficiency in last 5 years but still not a position of good. Again, city dynamics

and not having qualified and enough technical persons are big obstacle to go further in short time.

Table 3: Stock management at hospitals

INDICATOR	Hospital 1	Hospital 2	Hospital 3	Hospital 4
Management of Logistics	Available	Available but not clear	Not available	Stock and inventory u nit
Outsourcing	Some laboratory tests	Medicines, some laboratory tests, information, technology, cleaning, radiology, meals	Medicines, some laboratory tests, cleaning, radiology, meals	Information technology, technical support, security
Stock Availability	1 week stock in emergency room	3 times as needed stocks in hospital, 1 week stock in emergency and intensive care units	3 months stocks	Minimal stock requirements mainly 3 months stocks
Grouping of Stocks	Yes	Yes but general groups such as medical stocks	Yes	Yes
JIT	Moderate (3 months JIT)	No applied	No applied	Yes
Decreasing Stocks	75%	%115 ₺ 600,000 per month cost benefit	Controlling due dates of medicines, using standard devices, decreasing cycle of stocks	Decreased to 3 months stocks and more control
Cooperation with Suppliers	Yes	Available for critical stocks	Yes	Yes
Cooperation with Other Hospitals	Yes	Yes for some services	Yes	No
Loss of Stocks	Available(Low)	High About ₺ 600 000 per year	Available but not known the value of it	No
Value of Stocks	₺ 3 million equipment ₺ 300,000 medicine Stocks	₺ 6,000,000 Medicine stocks, ₺ 2 million not medical stocks	₺ 500, 000	₺ 141,688,978
Out-of-Stocks	No	5%	Yes Not known the exact approximation	No

Almost all hospitals have a responsible stock management except one hospital. This unit does not have clear structure and responsibilities. Almost all hospitals make a great extend of outsourcing. They manage their outsourcing through MKYS system. This is a huge amount of outsourcing. It is noticed that they make some laboratory and radiology tests outside and this brings a great load on patience and hospital. The most important outsourcing part is medicines with a great value inside hospital management as seen in Table 3. They apply regulations of Health Minister of keeping base safety stock and control their stocks periodically. They have a huge amount of stock especially Hospital 2 and this should be managed well. They have decreased their stocks in a great extend last 5 years but still not at the expected level when compared with JIT philosophy applied moderately by hospitals. Hospital 2 has a high loss of stocks due to theft, wrong usage, passing expiration dates etc. Stock-outs is also a problem for Hospital 2 and Hospital 3 and this is a really serious problem if it happens in great extent. Other hospitals are more successful. All hospitals have cooperation with suppliers but they have not defined the degree of partnership with them, which seem more formal and done according to government requirements.

Grouping stocks bring flexibility and decrease costs. All hospitals group their stocks but not according to value but similarities. Blood stocks management is very crucial in remote regions and they should be stocked in special conditions. Expiration dates controlling is another problem that hospital face and this can be covered by barcode system or improving the existing resource system. But even how well your system is, you need qualified person who will manage and control your stocks.

Conclusion

RFID technology is a great innovation to increase efficiency and decrease costs to a great extend. Even barcode system provides great flexibility. Bureaucracy resulted from government regulations is a big impediment to apply some new methods. Changes in structure of Health Minister and regional dynamics will decrease the bureaucracy. Different management philosophies can be tried in different hospitals. It should not be forgotten that changes come from top to down and without commitment of top management; it is not easy job to increase the value of hospitals. Hospitals are responsible to community and what they think about the hospital should be also analyzed as further step of this study. Personals are the most precious part of hospitals; they can be compared and added to this study. Healthcare staff services can be analyzed to see how effectively they treat patients and whether they apply the right methods or not. It is an interesting finding that hospital management of one hospital want periodical sufficiency exam of white color staff.

Optimization of supply chain is done to increase efficiency. Each hospital has its structure, culture, requirements and responsibilities. One general system cannot be build to optimize all processes. Each hospital should be analyzed separately and optimization tools can be applied to the model developed. Sometimes, it is not possible to apply optimization methods thus some heuristic models can be applied. Linear optimization and dynamic programming have common usages in healthcare management. Partnership can be extended to suppliers and cost sharing strategy may be applied if it is beneficial. It is noticed that coordination development among these hospitals and neighbor cities hospitals will bring great benefits. Some staff exchanges will decrease the workload of hospitals. Each hospital has its own strengths and weaknesses and these can be managed in coordination to get opportunities.

There is a need of more doctors and keeping them long time to get more beneficial results from them in Erzurum. The city has long and strong winter and isolated from other developed cities. Many experienced people prefer immigrating to other cities in West of Turkey than staying there. Efficient staff management performance is a must that need to be developed in hospitals. Staff should have open career steps. Even well qualified staff cannot go further in its career while important positions are mainly assigned according to governmental policies.

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Appendix

Table 4: Comparing hospitals according to main indicators

INDICATOR	Hospital 5	Hospital 6	Hospital 7	Hospital 8
Size	250 beds 670 persons	20 beds 70 persons	20 beds 47 persons	1322 beds 2311 persons
Quality	HM (Health Minister) Standards	HM Better service	Better technology with personals	TS-EN-ISO standards
Management	Good	Not good management capabilities, need of business management education	Good	Good
Bureaucracy	ASKOM (Referral between hospitals) problems	Problem	Moderate problem	Not answered
Core Operations	General	General, first cares	Birth, first cares	Research hospital
Image	Technological	Not technological	Technological	Model hospital
Ventures	No	No	Yes	No
Importance of Personal and Patience	Personal	Patience	Patience	Patience
Ranking of Pain	Yes	Yes	Yes	Pain form registration according to age and patience
Last 5 Years	30% Enlargement	Better position	Enlargement, but cannot keep persons	New Building and devices, transplantation, decreasing costs, better services, burn unit, nuclear medicine center, chemotherapy, bone marrow transplantation and IVF center, establishment of calibration laboratory
Next 5 Years	Personal improvement	Full-fledged hospital group would like to see a fully equipped technically	Personal politics, keeping personals for long time	Subsequent scientific developments using the latest technology, leading hospital maximum level of quality in service, better labor utilization rate to increase productivity, decreasing costs and stocks

Table 5: Efficiency indicators

INDICATOR	Hospital 5	Hospital 6	Hospital 7	Hospital 8
Performance	Cured patience Birth Rate % 96.5 rate(Given by HM)	80% The number of patients recovered: 10 The number of birth: 120	95% Patience satisfaction	95% capacity utilization rate, satisfaction with patient and relatives, employee satisfaction, debt income ratio, ratio of income receipts, bed occupancy rate, outpatient numbers (Surveys, registrations data)
Efficiency Increase	Rare, not good	Not good	Yes	High
Personal Control	HM control criteria	Quality standards, association of public hospitals		Grading academicians, other not available
Need of Efficiency	Specialized person devices	Yes	Yes Emergency cares	Improvements in personal, technology, developments Better quality Emergency cares Improvements in services
Automation System	HM system	MKYS (central registration control system)	MKYS	QDMS (integrated management system with the hospital information management system)

Table 6: Stock management at hospitals

INDICATOR	Hospital 5	Hospital 6	Hospital 7	Hospital 8
Management of Logistics	Available	Not available	Available	Not Available
Outsourcing	MR, tomography, laboratory kits	Cooking, cleaning and service procurement	Hormone assays and MR tomography	Almost everything needed
Stock Availability and Control	1 month periodic control of main stocks	Periodic control per month	Periodic control per month	Periodic control
Grouping Of Stock	Yes	Yes	Yes	Yes
JIT	No	Yes	Not answered	Yes but not applicable
Decreasing Stocks	% 25 – 35, ₺ 400-450.000	% 30 decreasing stocks, 30% earnings	20% stocks decrease	Decreased up to a satisfied level
Cooperation with Suppliers	Yes	City coordination	Yes	Yes
Cooperation with Other Hospitals	No	No	Yes	No
Loss of Stocks	₺140,000- 180,000 estimated for 2012 year	% 1	Not available	low
Value of Stocks	₺1, 000, 000 – 1, 500, 000	₺150, 000,00	₺10, 000	
Out-of-Stocks	No	No	No	No