Araştırma Makalesi – Original Article

Total Quality Management and the Impact of Innovation on the Performance of Hospitals: Example of Private Hospitals in Ankara*

Toplam Kalite Yönetimi ve İnovasyonun Hastanelerin Performansına Etkisi: Ankara İlinde Özel Hastaneler Örneği

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ABSTRACT

Aim: Everything in the world began to change radically. The health service provision within the health sector is one of the sectors that have been most affected by this change and transformed. The aim of the study is to examine Total Quality Management practices affect the performance of hospitals and innovations in health systems affect the performance of health institutions.

Method: Research data were obtained by collecting questionnaires from private hospital managers in Ankara between 29.08.2018 - 31.12.2018. Simple and multiple regression analysis was used, including a literature review.

Result: A total of 155 managers from 33 private hospitals, It was planned to reach all the managers included in the research, but 137 of them voluntarily participated in survey and agreed to contribute. Accordingly, the sample of the study represents 88.3% of the study population. The findings obtained as a result of the research were determined at the 95% confidence level.

Conclusion: In the century when technology has entered health services with digitalization and combined with artificial intelligence, rapid developments are experienced, and it seems that innovation, which has a key determinant role in providing competitive advantage in health service delivery, will continue to be the main character and increase its importance. While Total Quality Management practices focus on customer satisfaction in health services, innovation both facilitates the work of hospital staff and points out that it provides high performance by increasing the efficiency and effectiveness of the health service provided, and by providing the efficiency at the maximum level.

Keywords: Total Quality Management, Innovation, Hospital Performance, Regression

ÖZ

Amaç: Dünyada her şey radikal bir şekilde değişmeye başladı. Bu değişimden en çok etkilenerek dönüşüme uğrayan sektörlerin başında sağlık sektörü içerisinde sağlık hizmet sunumu gelmektedir. Çalışmanın amacı hastanelerde Toplam Kalite Yönetimi'nin ve inovasyonun hastane performansına etkisinin boyutunu incelemektir.

Yöntem: Araştırma verileri 29.08.2018- 31.12.2018 tarihleri arasında Ankara ilindeki özel hastane yöneticilerinden anket toplama ile elde edildi. Literatür taraması da dahil olmak üzere basit ve çoklu regresyon analizi kullanıldı.

Bulgu: Toplamda 33 özel hastaneden yönetici kadrosunda yer alan 155 yönetici oluşturmaktadır. Araştırmada yer verilen tüm yönetici sayısına ulaşılmak planlanmış ancak 137'si ile yüz yüze anket çalışmasına gönüllü olarak katılıp, katkı sağlamayı kabul etmiştir. Buna göre, çalışmanın örneği, çalışma evrenini % 88,3 oranında temsil etmektedir. Araştırma sonucunda elde edilen bulgular % 95 güven düzeyinde saptanmıştır.

Sonuç: Teknolojinin dijitalleşme ile sağlık hizmetlerine girdiği ve yapay zeka ile birleştiği yüzyılda hızlı gelişmeler yaşanmakta ve sağlık hizmeti sunumunda rekabet avantajı sağlamada kilit belirleyici bir role sahip olan inovasyon ana karakter olmaya ve önemini arttırmaya devam edecektir. Toplam Kalite Yönetimi uygulamaları sağlık hizmetlerinde müşteri memnuniyetine odaklanırken, inovasyon hem hastane personelinin işini kolaylaştırmakta hem de sunulan sağlık hizmetinin verimliliğini ve etkinliğini artırarak ve verimliliği maksimum düzeyde sağlayarak yüksek performans sağladığına işaret etmektedir.

Anahtar Kelimeler: Toplam Kalite Yönetimi, İnovasyon, Hastane Performansı, Regresyon

Mersin Üniversitesi Tıp Fakültesi Lokman Hekim Tıp Tarihi ve Folklorik Tıp Dergisi, 2022;12(3): 645-657
DOI: 10.31020/mutftd.1097160
e-ISSN: 1309-8004, ISSN 1309-761X
Geliş Tarihi – Received: 1 April 2022; Kabul Tarihi - Accepted: 12 August 2022
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Ethical Approval: Near East University Scientific Research Ethics Committee (Date: 29th August 2018, project number: NEU/SB/2018/196

Introduction

The purpose of the study is after the establish of the Association of Performance Management and Improvement Quality on-site of Ministry of Health in Turkey, put forth the contribution of Total Quality Management practices and innovation approach in hospitals to performance of hospitals between 2007 and 2018. In order to do this, the questionnaire study which will be performed with hospital managers, is evaluated whether the change in the process makes a significant contribution to performance.

Total Quality Management demands that change be based on the requirements of the client not the values of providers. It requires the significant participation of all personnel department and a speed and thoughtful reaction from top management to suggestions made by participating personnel. Total Quality Management, first occurred in the United States and successfully implemented in Japan is clearly pick up serious attention by United States health service organizations as they try to upgrade quality with fewer resources.[1]

In the study conducted to reveal the relationship between firm performance and innovation, it has been revealed that while they have a reducing effect on financial performance, they increase financial performance.[2]

Total Quality Management is a procedure increasingly used by hospitals to develop the quality and results of care. It is determined as the systematic participation of health care teams in identifying the fundamental causes of unnecessary variation in processes and results of care and taking restorative and preventative action with the goal of persistent quality improvement in patient care delivery.[3] Total Quality Management would provide experimental controls and random placement of subjects and problems, permitting the Total Quality Management approach to problem solving to succeed or not with controls.[4]

Total Quality Management is a notional approach different from quality guarantee and quality investigation and runs counter to many underlying suppositions of bureaucracies. Total Quality Management demands that change be based on the requirements of the customer, not the importance of the providers. It requires the meaningful participation of all personnel and a rapid and thoughtful response from top management to suggestions made by participating personnel.[1]

Total Quality Management aimed at meeting customer satisfaction which is consolidated system of persistent quality improvement. The aim of the Total Quality Management is the elimination of the faults by remove the occasions of the faults. Total Quality Management is proactive in nature, its purpose is to build quality goods and services into the design of the process and then continuously to improve them.[5] Quality improvement may demonstrate encouraging strategy for decrease errors and increase safety in hospitals.[6]

Performance is an output that employee gained as a result of to realize organizational aims that wanted to be reach. In literature organizations have seven levels of performance that these are efficiency, productivity, quality, working environment, innovation and profitability. Total Quality Management also has the mission of collecting and analyzing the performance outputs and data that obtained in order to improve service quality in health institutions. In this context accurate measurement of performance is one of the objectives of Total Quality Management.

Several studies have examined relationship of Total Quality Management and hospital performance. Alexander, Weiner and Griffith examine the association between the scope and intensity level of quality improvement implementation in hospitals and organizational performance. Sample of 1784 hospitals was used to assess relationship as a result of study hospitals that implement QI effectively can reasonably expect to improve their financial and cost performance.[7]

Innovation in Healthcare; product, process and structure. While the product is considered as the payment made by the patient for the service received. Process innovation, which includes innovations at the production or delivery stage. It is defined as innovation in the possibility of producing or delivering the product that creates a noticeable increase in the value offered to the use of the stakeholders. Another is structural innovation, which introduces new business models that improve internal and external structure and include infrastructural innovations.[8]

Kunst and Lemmink showed in their study that different explanatory variables are linked to progress in total quality management and business performance. Result of the study, there is a positive link between progress in Total Quality Management and perceived service quality by customers.[9]

Alolayyan et al. study and analyse the implementation of Total Quality Management and operational flexibility dimensions towards improving hospital performance and reducing costs and medical errors. They propose a mathematical model employing artificial neural networks. Results of the study give avery high degree of accuracy in relationship between Total Quality Management variables and operational flexibility dimensions to hospital performance.[10]

Carter et al. separate the concept of Total Quality Management into two dimensions that quality practices and quality context. They employ a structural equation modeling to show that quality practices and quality context are distinct model components operating at the same time through the endogenous construct of Total Quality Management to positively impact hospital performance. In order to improve hospital performance, scope of the organizations quality activities need to be very broad and surrounding. Additionally authors assess the potential moderating effects of environmental uncertainty and hospital size on the quality management-performance relationship.[11]

Materials and Methods

Approval for the research was obtained from the Near East University Scientific Research Ethics Committee with the project number NEU/SB/2018/196 dated 29th August 2018, and the whole process of the study was carried out in accordance with the Principles of the Declaration of Helsinki.

The survey form used in the research consists of four sections. Demographic questions, the Total Quality Management scale is composed of seven sub-dimensions and 44 items, the Innovation scale is made up of 11 items, and the performance scale is made up of one factor and six items.

The universe of the research is the chief physician, deputy chief physician, hospital manager, deputy hospital manager and hospital quality coordinator of 31 private hospitals operating in Ankara in 2018. As the sampling selection method, one of the purposeful sampling methods was chosen easily. According to this technique, data is collected by interviewing the subjects with the appropriate profile, which is the most easily accessible, to provide the sampling in the volume required for the researcher study.[12] Those who signed the informed consent form and obtained their consent were included in the study. The data were collected through a questionnaire from managers who meet the criteria of the research in private hospitals in the city of Ankara, Akyurt, Altındağ, Ayaş, Balâ, Beypazarı, Çamlıdere, Çankaya, Çubuk, Elmadağ, Etimesgut, Evren, Gölbaşı, Güdül, Haymana, Kahramankazan, Kalecik, Keçiören, Kızılcahamam, Mamak, Nallıhan, Polatlı, Pursaklar, Sincan, Şereflikoçhisar ve Yenimahalle.

Inclusion criteria was determined as;

1. Being a manager in private hospitals for at least one year,

2. The hospital in charge has been operating since 2006 at the latest,

3. Providing inpatient care services in the hospital where the duty is assigned.

Exclusion criteria from the study was determined as;

1. Being a manager in health institutions other than private hospitals,

2. Being a manager in private hospitals for at least one year,

3. The commissioned hospital starts operating in 2006,

4. Inpatient care service is not provided in the hospital in charge.

In the research, a questionnaire form was used as a data collection tool. Face to face interviews were made with the units in the sample group of the research. The questionnaire form used in the research consists of four parts. Dependent variable is hospital performance scale (HPS). Independent variable is innovation scale (IS) for simple regression model and Total Quality Management approaches which management leadership (ML), decision making (DM), process (P), continuous improvement (CI), employee participation (EP), suppliers relation (SR) and patient focus (PF) for multiple regresion model.

We obtain data from private hospitals managers in Ankara province. we carried out to validate the questionnaire and to gain more in depth perceptions in innovation and quality practices of hospitals. Scales which will use for study prepared according to literature. Innovation scale, Total Quality Management scale and performance scale questions asked to one hundred thirty seven managers. Innovation scale transcribed from andscales.[13,14] Total Quality Management scale has seven approaches that management leadership, employee participation and process approach transcribe from, decision making and continuous improvement approach from, relation with suppliers and patient focus approach from.[15-18] Performance scale transcribe from study of.[18]

There are two research questions; First one is innovations in health systems affects the performance of health institutions. Second is Total Quality Management practices in hospitals affect the performance of hospitals.

We use in this study simple regression model and multiple regression model. Simple regression model developed forthe relation between innovation approach and hospital performance. Multiple regression model developed for correlation between Total Quality Management approaches and hospital performance. Dependent variable in both two analysis is hospital performance scale (HPS). Independent variable is innovation scale (IS) for simple regression model and Total Quality Management approaches which management leadership (ML), decision making (DM), process (P), continuous improvement (CI), employee participation (EP), suppliers relation (SR) and patient focus (PF).

Results

Table 1. Demographic Form

Variable		**n**	**%**
Gender	Female	33	24,1
	Male	104	75,9
		X	**SD**
Age		51,49	7,41
Working Duration In Healty Sector		22,99	6,29
Working Duration In Healty Sector As A Manager		10,12	4,21

Table 2. Descriptive Statistics of Total Quality Management Scale

Sub-dimensions	N	Mean	Standart Deviation	Skewness	Kurtosis
Management Leadership	137	3,91	0,75	-0,984	1,122
Decision Making	137	3,84	0,95	-0,845	0,752
Process	137	3,58	0,65	0,544	0,258
Continuous Improvement	137	3,46	0,37	0,236	0,369
Employee Participation	137	3,75	1,11	-0,753	0,784
Suppliers Relation	137	3,23	0,49	-1,112	0,654
Patient Focus	137	3,68	0,89	0,299	0,951

Reliability analysis

The reliability analysis was conducted by calculating the Cronbach's Alpha for each scale to check the consistency of Total Quality Management approaches and performance level of hospitals. The results in the demonstrate that the values of Cronbach's Alpha are between 0,714 and 0,854, so these values indicate high reliability of scales. ***(Table 3)***

Table 3. Cronbach's Alpha values for each variables

Variables	Number of Items	Cronbach's Alpha
IS	11	0,809
HPS	12	0,854
ML	6	0,781
DM	8	0,726
P	7	0,786
CI	6	0,734
EP	5	0,726
SR	5	0,779
PF	7	0,714

Statistical analysis

Simple Regression Model

Regression analysis is a method used to examine the relationship between a single dependent variable and single independent variable. This analysis was tested to research whether there is any significant relation between innovation and hospital performance. To check the assumptions regarding normality and linearity, p-p plot of residuals were carried on. ***(Figure 1.)*** Durbin-Watson value obtained 1,790 which is between 1,50 and 2,50 demonstrate that there is no autocorrelation issue in the data.

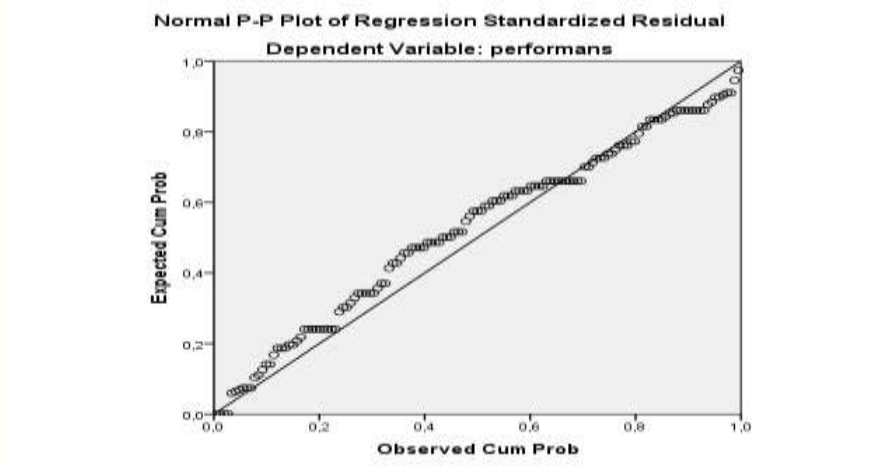

Figure 1. Normal p-p plot of regression standardized residual

Table 4 showed the results of simple regression model. R square value of analysis is 0,529 that means innovation approach in hospitals explain changes in hospital performance in proportion as %52. F statistic significance value is 0.000. Therefore our test is entirely significant. In the table parameters estimates are given. Coefficient of innovation scale variable is 0,825 and t-test of this model is significant because significance value is less than 0,05. Coefficient of innovation scale means that increase by one unit in innovation scale will increase 0,825 unit to hospital performance. ***(Table 4)***

Table 4. Simple Regression Model Results

Model	**R**	**R Square**	**Adjusted R Square**		**Std. Error of the Estimate**	**Durbin Watson**
1	,727[a]	0,529	0,525		0,2239	1,790
Anova						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	7,601	1	7,601	151,608	0
	Residual	6,768	135	0,05		
	Total	14,369	136			
Coefficients						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	0,781	0,315		2,477	0,014
	innovation scale	0,825	0,067	0,727	12,313	0,000

Multiple regression analysis is a method used to examine the relationship between a single dependent variable with multiple independent variables. This analysis is tested the research whether there is any significant relation between Total Quality Management approaches and hospital performance. ***(Table 5)*** Normal p-p plot of residuals were conducted to explore the assumptions regarding normality and linearity. ***(Figure 2)*** The Durbin Watson value is 2,016 which is between 1,50 and 2,50 that there is no autocorrelation in the data. Also Table 3 shows that each variables tolerance value are higher than 0,10 and variance inflation factor (VIF) is less than 10. These findings point out that the model had no serious multicollinearity problem. The coefficient of determination R2 value shows the percentage of the dependent variable explained by the independent variables included in the model.

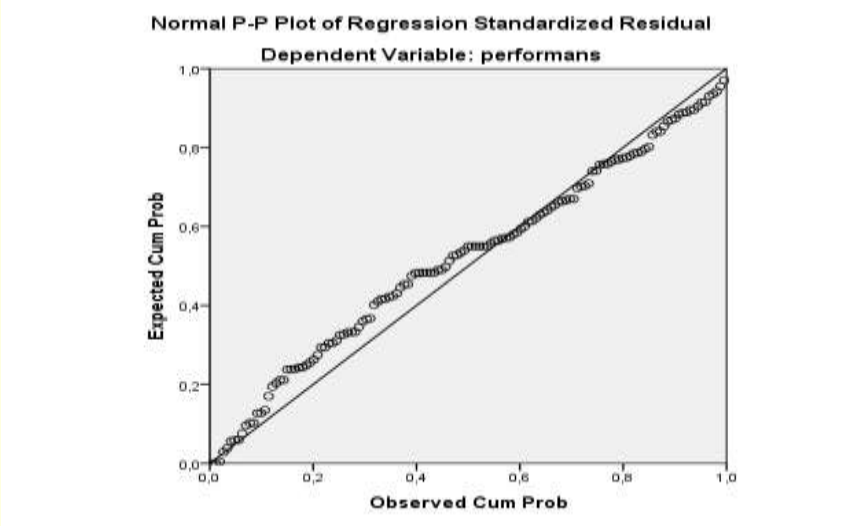

Figure 2. Normal p-p plot of regression standardized residual

In multiple regression models R2 increases automatically as the number of variables increase. It is much more accurate that using the adjusted R2 value instead of R2. Adjusted R2 is 0,702 which express %70 of hospital performance was explained by Total Quality Management approaches. The proposed model was significant at the 1% level (F-statistics significant value is 0,000). This means that there is a strong statement that all model was statistically significant and there is positive relationship between Total Quality Management approaches and hospital performance. The standardised beta coefficients and t-values demonstrated in Table 5 point out the positive association between three Total Quality Management approaches which are CI, PF and EP with the hospital performance. We use stepwise selection method in regression model. In this method each variable added to model in order and than model is evaluated. If the added variable contributes to the model the variable remains in the model. However, the other variables in the model retested to assess whether they contribute to the model. If there is no significant contribution, it is removed from model. Thus, the model is explained with the help of the minimum number of variables.

Table 5. Multiple Regression Model Results

Model Summary								
Model	**R**	**R Square**	**Adjusted R Square**		**Std. Error of the Estimate**		**Durbin Watson**	
1	,754[a]	0,569	0,566		0,21415			
2	,810[b]	0,657	0,652		0,19187		2,016	
3	,838[c]	0,702	0,695		0,17953			
ANOVA[a]								
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**		
1	Regression	8,177	1	8,177	178,31	0,000		
	Residual	6,191	135	0,046				
	Total	14,369	136					
2	Regression	9,436	2	4,718	128,159	0,000		
	Residual	4,933	134	0,037				
	Total	14,369	136					
3	Regression	10,082	3	3,361	104,262	0,000		
	Residual	4,287	133	0,032				
	Total	14,369	136					
Coefficients[a]								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
		B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
1	(Constant)	1,331	0,25		5,336	0,000	1,000	1,000
	CI	0,714	0,053	0,754	13,353	0,000		
2	(Constant)	0,523	0,263		1,991	0,048		
	CI	0,456	0,065	0,481	6,983	0,000	0,540	1,853
	PF	0,431	0,074	0,403	5,846	0,000	0,540	1,853
3	(Constant)	0,317	0,25		1,269	0,207		
	CI	0,338	0,066	0,357	5,085	0,000	0,455	2,196
	PF	0,328	0,073	0,306	4,505	0,000	0,485	2,060
	EP	0,266	0,059	0,293	4,477	0,000	0,523	1,912

Correlation analysis results of performance and innovation variables are shown in ***Table 6***. The pearson correlation coefficient was found to be 0,727. The fact that this coefficient is close to 1 indicates that the strong relationship. In addition the sign of this coefficient "+" indicates that positive relationship. It can be said that there is a strong and positive relationship between hospital performance and innovation.

Table 6. Correlation Results Between Hospital Performance and Innovation

		Performance	Innovation
Performance	Pearson Correlation	1	,727**
	Sig. (2-tailed)		,000
	N	137	137
Innovation	Pearson Correlation	,727**	1
	Sig. (2-tailed)	,000	
	N	137	137

The results of the correlation analysis between the CI, PF, EP and hospital performance variables, which we found relationship according to multiple regression test, are shown in ***Table 7***. Pearson correlation coefficients were respectively 0,754-0,712-0,729. In this case CI, PF and EP from the Total Quality Management approaches are positively and strongly associated with performance of hospital.

Table 7. Correlation Results Between Hospital Performance and CI, EP and PF

		Performance	Continuous Improvement	Employee Participation	Patient Focus
Performance	Pearson Correlation	1	,754**	,713**	,729**
	Sig. (2-tailed)		,000	,000	,000
	N	137	137	137	137

Discussion

Total Quality Management is a systematic approach to prepare and perform continuous improvement in performance. Total Quality Management emphasizes persistent examination and development of work processes by teams of organizational colleagues worked out in essential statistical techniques and problem solving tools and authorized to make decisions based on their analysis of the data. Total Quality Management practices is ordering on individuals and organizations. It requires continuous leadership, comprehensive training and support, robust measurement and data systems, realigned incentives and human resources practices, and cultural openness to change.[6]

In the research, positive and statistically significant relationships were found between TQM practices of private hospitals and their perspectives on innovation. Accordingly, within the scope of TQM practices, a moderate level of relationship was determined between the innovation attitudes of private hospitals and management leadership approaches, decision making approaches, and supplier relation attitudes. In addition, there was a high correlation between the innovation attitudes of private hospitals and the process approaches, continuous improvement approaches, employee participation approaches and patient focus approaches of hospitals.

Researchers have suggested that companies should implement TQM to increase performance by focusing on enabling and facilitating the innovation culture. Santos-Vijande and Álvarez-González in 2007 collected and analyzed data from 93 firms that produced and did not manufacture in Spain.[19] The results of the study showed that TQM significantly affected innovation.

Prajogo in 2005 Australian Quality Organization Member randomly selected from 1000 executives, conducted a survey and received feedback from 194 firm managers.[20] As a result of the analysis made by using the structural equality model technique with the data they obtained, it was concluded that the quality management practices that are in line with the dimensions of leadership, strategic planning, customer

orientation, knowledge and analysis, people management, process management and product quality positively affect the quality performance.

Nijoki Ndiritu in 2015 conducted multiple regression analysis with the data obtained from 87 companies operating in Kenya within the scope of her doctoral thesis study conducted at Nairobi University, and as a result of the analysis, she found that leadership, education and quality knowledge positively affect the performance of the company. [21]

Increasing life standards and expectations of higher service standards, which increase patient awareness, made it necessary for Total Quality Management applications to gain importance and to switch from the old administrative structures of health institutions to a new dynamic and innovative managerial model. All countries, including the leading countries in the world, continue to find new methods to provide better and higher quality service to patients in health services, to develop preventive treatment methods and new treatment methods, to put them into practice and to apply them successfully, and to continuously improve and develop.

In their research on 100 companies operating in the logistics sector in Küçük et al. in 2015, Trabzon and Gümüşhane, the operational performance of TQM; They concluded that the leadership of the management positively affected the performance of the company.[22]

Baird et al. in 2011, in their study of 364 service and manufacturing companies in Australia, they found that process management and supplier quality management positively affect the performance of the business.[23]

Likewise, managers who are experts and professionals in the health sector have initiated innovation practices in the health sector by not only addressing health management but also the management of health institutions.[24]

In this study, innovation processes of private hospitals have been found to have an impact on their organizational performance. As a result of the development in the competitive environment, innovation is rapidly progressing to be a critical factor in the performance and continuity of private hospitals. Likewise, Balachandra and Friar in 1997 think that successfully introducing new products to the market is the lifeblood of many institutions.[25] The importance of product innovation in terms of achieving good and long-term results of a company is widely known today and has found extensive coverage in the literature.[26] In this study, it was determined that the innovation attitudes of private hospitals had an effect on the performance levels of the private hospital.

Naktiyok and Küçük in 2003 found that leadership, knowledge and analysis, strategic planning, human resource management, process quality management, quality activity results and customer satisfaction positively affect business performance in a study conducted on 274 SMEs.[27]

Arumugam et al. in 2008, leadership, process management, information analysis, customer orientation, supplier relations, quality system improvement, continuous improvement, human, as a result of analyzing the data obtained from 122 manufacturing companies in Malaysia with ISO 9001 certification with the method of structural equality model. They obtained the conclusion that customer orientation and continuous improvement positively affect the quality performance of TQM applications consisting of dimensions of interest.[28]

Arostegui et al. in 2013, in their research on 230 leading companies in Spain, the innovation performance of the companies, consisting of leadership, strategic planning, customer orientation, information and analysis, human resources management, process management and supplier management, consisting of product and process innovation dimensions.[29] They concluded that it positively influenced significantly. It was concluded

from the TQM applications that only Continuous Improvement, Employee Participation and Patient Focus approaches affect the performance of private hospitals. This situation is in line with the literature. When the customers and suppliers are included in the process of providing feedback and developing the company, it can be said that the company performances increase at the same rate.[30] In their research on 100 companies operating in the logistics sector in Küçük et al. in 2015, Trabzon and Gümüşhane, the operational performance of TQM; They concluded that the leadership of the management positively affected the performance of the company.[22]

In their research to determine the innovative attitudes of nurses, it was determined that nurses with higher education levels had a higher average of innovative attitudes.[13] In another study that supports this study, it has been revealed that the management should give importance to the material and moral support systems in order to keep the employees' education in their plans to increase the innovative behavior of the company employees.[31]

According to the results, some but not all Total Quality Management approaches have significant effect on hospital performance. This study revealed three Total Quality Management approaches which are continuous improvement (CI), patient focus (PF) and employee participation (EP). PF leads to a better understanding of patients requirements and expectations, afterwards this will help to increase performance. Patient feedbacks and use these feedbacks in processes improve satisfaction and also performance of hospitals. EP leads to adapting quality management practices to organization culture and employees in organization. Providing more constructive and objective feedback to health workers and more effective planning and guidance of their individual development and training increases the employees organizational loyalty and job satisfaction, thus directly affecting performance positively. Another significant approach is CI. Total Quality Management supports the systematic follow-up of the achievements, personal qualities and development potentials of the health sector employees with scientific methods. In other words, it is important to make a judgement about the performance of employees. In addition, Total Quality Management focuses on basic responsibilities related to working life, organizational behaviours and aims to optimize the performance of the organization and individuals.

Patients who want to receive health services and sometimes their relatives can come with them. The patient whose health integrity is impaired, who feels pain or pain, and the patient's relative who is worried about this situation may be anxious and create tension in the hospital environment. In these cases, it is expected that this process will be carried out successfully, from the car park service that the patient first encounters when he arrives at the door of the hospital, from the consultation, where he conveys the first information about his disease the moment he steps into the hospital, to the patient registration process, to which he is directed, that there are no conflicts that may arise, and that the experiences during the first service recognition process that the patient encounters will create trust in the patient and his/her relatives. The feeling of trust experienced in this first encounter will then start to feel better and relax during the examination, diagnosis and treatment of the patient and his relatives.

Recording of the patient's past illnesses and chronic illnesses, which are stored in digital media, can provide rapid diagnosis and diagnosis during the examination. The operation of such patient registration systems can not only provide convenience to the doctor, who is a hospital employee, at the time of the examination, but also a better and immediate intervention to the patient who is going through the process.

The patient identification system used at the time of entry and the techniques used during the examination and the technology applied during the treatment include new systems; while the patient and his/her relatives who receive the health care service feel that they receive the best service, the patient who completes this process in a satisfied, most importantly healthy way, and the patient's relative who witnessed this process,

recommend this process to others, resulting in an increase in the reputation of the hospital and the number of patients who want to receive service.

Conclusion and Suggestions

It is observed that innovation, which is one of the main determinants of competitive advantage in the health sector, which has taken a step with digitalization in health services and where rapid technological developments occur by combining with artificial intelligence, will continue to increase its importance.

In terms of organization, performance is an important trigger for sustainability and quality. This research in line with these definitions it aims to reveal the effect of total quality management and innovation on the performance of hospitals. The results of the study demonstrate the importance of Total Quality Management practices and innovation in hospitals by revealing its positive effect on the performance of private hospitals in Turkey. In response to the research the findings gave a statistical evidence for the positive and significant relationship between Total Quality Management approaches, innovation and hospital performance. The results demonstrate that three Total Quality Management approaches are significantly and positively related to hospital performance. Continuous improvement approach, patient focus approach and employee participation approach has the strong association with the performance level of hospitals. In addition to this innovation practices also has positive relation with the performance. In practice, the effective implementation of these Total Quality Management approaches can help health organizations to improve their performance level.

While Total Quality Management practices focus on customer satisfaction in health services, innovation both facilitates the work of hospital employees and points out that they show high performance by increasing the efficiency and effectiveness of the health service provided, and by providing the efficiency at the maximum level.

Private hospitals that adopt patient relationships as one of the Total Quality Management elements will perform better in innovation than their competitors. For this purpose, private hospitals should have regular and permanent relationships with patients who refer to them. He should closely monitor changes in the expectations of patients who come to the hospital.

Hospital administrators should have the same relationship with health workers. Because when a system with good relationships with health care personnel is established, an effective communication network can be established between departments and thus exchange interdisciplinary information.

With all this, by providing an increase in effectiveness and efficiency of Total Quality Management applications, this study is expected to shed light on health artificial intelligence studies in terms of innovation, with an effort to optimize with error-free service delivery and innovation to increase processing speed and maximize the benefit provided in all processes.

Acknowledgements

There is no conflict of interest. This study was produced from the doctoral thesis prepared by Dr. Asena Tuğba Evren Subaşı.

Ethical Approval

Approval for the research was obtained from the Near East University Scientific Research Ethics Committee with the project number NEU/SB/2018/196 dated 29th August 2018.

Author Contributions

Asena Tuğba Evren Subaşı: Study conception and design, data collection, data analysis and interpretation, drafting of the article, critical revision of the article.

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