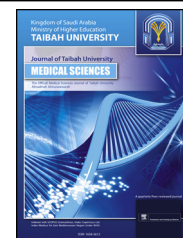




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Original Article

Implementation of total quality management in hospitals

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المخلص

أهداف البحث: تهدف هذه الدراسة إلى معرفة مدى تطبيق إدارة الجودة الشاملة في المستشفيات وعلاقتها بالمتغيرات الديموغرافية.

طرق البحث: أجريت هذه الدراسة المقطعية لجمع البيانات من ٣٣٢ ممرضة باستخدام استبانة تعباً ذاتياً. تطوعت المشاركات من القطاعات الصحية الحكومية، والعسكرية، والجامعية، والخاصة.

النتائج: أظهرت نتائج هذه الدراسة أن ٧٠٪ من التفاوت في تطبيق إدارة الجودة الشاملة يمكن تحقيقها باتباع مبادئ إدارة الجودة الشاملة. وهذه المبادئ تشمل التحسين المستمر، والعمل الجماعي، والتدريب، والتزام الإدارة العليا، والتركيز على العملاء. وكان التحسين المستمر هو أهم عامل في تفسير التفاوت في تطبيق مبادئ إدارة الجودة الشاملة. يتم تطبيق إدارة الجودة الشاملة في المستشفيات الأردنية بمستوى أقل من ٦٠٪. وكان أكثر المبادئ تطبيقاً هو التركيز على العملاء والأقل تطبيقاً هو التحسين المستمر. يطبق القطاع الخاص هذه المبادئ أكثر من القطاعات الأخرى.

الاستنتاجات: يجب توجيه الجهود لإنشاء مؤسسة تعنى بفحص واعتماد الجودة في نظام الرعاية الصحية.

الكلمات المفتاحية: إدارة الجودة الشاملة؛ التحسين المستمر للجودة؛ تنظيم الخدمات الصحية

Abstract

Objectives: The aims of the study were to explore the extent of Total Quality Management (TQM) implementation in hospitals and its association with demographic variables.

Methods: This cross-sectional study collected data from 332 nurses using a self-developed questionnaire. The participants were recruited from government, military, university and private health sectors.

Results: The results of this study showed that 70% of variance in implementing TQM can be achieved by following the principles of TQM. These principles include continuous improvement, teamwork, training, top management commitment and customer focus. Continuous improvement was the most significant factor in explaining variance in implementing TQM principles. TQM was implemented in Jordanian hospitals at a level approximately less than 60%. The most implemented principle was customer focus, and the least implemented was continuous improvement. The private sector implemented all of these five principles more than other sectors did.

Conclusion: Efforts should be focused on establishing a foundation that can inspect and accredit quality in the health care system.

Keywords: Continuous quality improvement; Health service organization; Total Quality Management

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Introduction

Total Quality Management (TQM) is one of the most prominent developments in management for the past two decades. TQM started in Japan in the early 1980s and spread

to the Western countries and Australia. In the 1990s, TQM topics became very important, and many companies were looking to apply TQM and use it to develop and improve their businesses.¹

Total Quality Management is defined as “a management philosophy concerned with people and work processes that focuses on customer satisfaction and improves organizational performance”.²

These days, health organizations face many challenges that can be classified into four major areas: increases in the cost of health services, rapidly growing technology dependence, pressure on health organizations to decrease costs and improve quality to cope with the international organizations that establish standards and give licenses^{3,4} and finally satisfying patients’ needs, a major demand requiring hospitals to maintain high quality services.⁵ Such challenges force health planners to adopt a system that can manage health care in a measurable way to offer a high quality service, which is the aim of the quality management programs in hospitals.⁶

The system that can cope with all of these challenges and resolve all health organization’s problems is TQM.⁷ Total Quality Management is also known as continuous quality improvement (CQI),⁸ quality improvement (QI),⁹ quality management (QM) and total quality control (TQC).⁹

Experts¹⁰ indicate that the key principles of TQM include the following: customer focus, obsession with quality, scientific approach, long-term commitment, teamwork, and continual improvement systems, education, and training, freedom through control, unity of purpose and employee involvement and empowerment.

The liability of nursing personnel is mainly restricted in the implementation and evaluation of the TQM programs. Nurses represent more than eighty percent of the health workers in any hospital.¹¹ Sixty percent of nursing personnel work in hospitals.¹² These nurses have played a significant role in the implementation and success of TQM programs.

Because research on the implementation of Total Quality Management (TQM) has been limited, particularly in developing countries, this study aims to answer the following questions:

1. To what extent are TQM principles implemented in Jordanian hospitals from the nurses’ point of view?
2. Are there any differences concerning the extent of implementing TQM among the different health sectors?
3. Are socio-demographic factors of nurses (gender, age, educational level, experience, work department, daily served patients, availability of a TQM department) affecting the extent of TQM implementation in those hospitals?

Materials and Methods

Research design

A comparative cross-sectional study was used to collect data from respondents.

Setting

Data were collected from four hospitals, which were purposely chosen to represent the four health sectors:

government, university, military and private. In addition, different geographic regions were considered. The data were collected from nurses who worked in hospitals in Jordan.

The sample

A convenient sampling technique was used to collect data from nurses in the four hospitals. Potential respondents consisted of nurses on the morning shift on that day. Any nurse could complete the questionnaire, including staff nurses, practical nurses or aid nurses.

The instrument

Self-administered questionnaires developed by the researcher were used to collect data for the nurses’ socio-demographic information (gender, age, education level, experience, work department and number of patients served daily) and items that measured the extent of implementing various principles of TQM. Statements about TQM were rated on a Likert scale ranging from (1) strongly disagrees to (5) strongly agree.

Procedures and data collection

The aim of the study and details of answering the questionnaire were explained to the nurses, and a verbal agreement was obtained from each respondent. Each questionnaire had a cover letter that contained a brief summary of the purpose of the study and confidential considerations. The questionnaires were given to each participant with full instructions on how to answer it.

Ethical considerations

The study protocol and questionnaire were approved by the Scientific Research Board of the Jordan University of Science and Technology. Nurses were given the Information Sheet to read, and the research’s goals were explained orally. Nurses were assured that their participation was completely voluntary.

Validity of the instrument

To ensure the content validity of the instrument, the questionnaire was assessed by five experts in health care management and hospital management and an expert in quality programs at the Ministry of Health. According to their recommendations, some questions were modified.

Reliability of the study

A pilot study was carried out on 45 nurses. The sample for the pilot study was not included within the study. Cronbach alpha was 0.90. According to the feedback from the respondents, changes were made to some items.

Data analysis

Statistical Package for Social Sciences (SPSS) version 13 was used for data analysis. Percentages and frequencies were used for sample description. Means and standard deviation were used to determine the extent of TQM implementation. The ANOVA test was used to test the differences in the implementation between different hospitals.

Regression analysis was used to evaluate the relationships between nurses' socio-demographic variables, availability of a TQM department as independent variables and the implementation of TQM as a dependent variable.

Factor analysis was applied to identify the significant principles of total quality management (TQM) applied in hospitals, to minimize and to classify data to a limited number of factors. P-value < 0.05 was considered as statistically significant.

Results

Participant' characteristics

A total of 445 questionnaires were delivered to the nurses in the four hospitals. Of those, 332 (75%) questionnaires were filled in by the nurses. Table 1 shows that 67.8% of the respondents were female. Approximately 90% of the participants had an age less than 39 years old. Most of the participants' working experiences were less than 10 years (61.2%), and only 8.3% had more than 20 years of experience. More than half of the participants had a

diploma-level education (56.2%), and 1.8% had post-graduate degrees. The nurses' working departments were as follows; 23.3% in surgical departments, 21.8% in the ICU and 34.7% working in other departments, including maternity, paediatric dialysis units and others. Approximately 37% of the participants were from a university hospital, 28.9% from a military hospital and 23.5% from a government hospital.

Factor analysis

The principal components analysis had given the amount of variance, explained by each factor and cumulatively (70% was used). It provides the weight for each variable on each factor. The weight (loading) expresses the extent to which the variable is correlated with the factor. In Table 2, the numbers that are in the same column related to one factor, which is named by C1 or C2, etc.

Factor Analysis was applied to identify the principles of Total Quality Management (TQM) applied in the Jordanian hospitals. Five principles resulted from using Principal Component by Varimax Rotation Method: continuous improvement, teamwork, training, top management commitment and customer focus. These five principles explained 70% of the variance in the 40 items included in the questionnaire.

The questionnaire items and factor loadings are presented in Table 2. All items were loaded if the factor loading is ≥ 0.40 . Using these criteria, twelve items were found to load as continuous improvement. Eight items were loaded as teamwork, and six items were loaded as training. Eight items were loaded as top management commitment, and six items were loaded as customer focus.

Nurses' attitudes towards the implementation of TQM concepts

The average scores that represent the extent of implementing TQM concepts were below 60% for all identified principles, indicating poor implementation of TQM principles in Jordanian hospitals (Table 3).

Differences in the extent of TQM principles implementation between hospitals

Analysis of variance (ANOVA) showed a significant difference ($P < 0.01$) in all principles of TQM among different types of hospitals from the nurses' perspective. The implementation was highest at the Irbid Specialist Hospital.

Differences due to the extent of implementing TQM principles in the hospitals are shown in Table 3. Continuous improvement, teamwork and customer focus were applied at the Irbid Specialist hospital (a private hospital) to a greater extent compared with other hospitals. Training and top managerial commitments were applied to a greater extent at ISH than at the university hospital and the government hospital. All other hospitals applied TQM similarly, except for top management commitment, which was applied more in the military hospital compared to the government hospital.

Table 1: The socio-demographic data of the sample.

Variables	Number	Percent
Sex		
Male	^a 105	(32.2)
Female	221	(67.8)
Age		
<30	^a 194	(61.4)
30–39	89	(28.2)
40–49	32	(10.1)
≥ 50	1	(0.3)
Experience (Years)		
<10	^a 200	(61.2)
10–19	99	(30.4)
≥ 20	27	(8.3)
Education level		
Diploma	^a 186	(56.2)
Bachelor	139	(42)
Post Graduated	6	(1.8)
Department		
Medical	^a 56	(17.2)
Surgical	76	(23.3)
Intensive Care	71	(21.8)
Emergency	10	(3.1)
Others	113	(34.7)
Hospital type		
University Hospital	124	(37.3)
Public Hospital	78	(23.5)
Private Hospital	34	(10.2)
Military Hospital	96	(28.9)

^a Missing value.

Table 2: Rotated factor pattern from principal component analysis of TQM.

Items	Statements	C1	C2	C3	C4	C5
1	The employee from different administration levels can participate in decision-making.	0.81				
2	The authorization of employees includes the TQM improve quality.	0.79				
3	The top management involves all employees in the planning process to improve the quality of services in the hospital.	0.76				
4	The employee can participate in solving problems to improve quality.	0.75				
5	The quality policies are clear and known.	0.70				
6	The hospital educates employee on the TQM.	0.68				
7	The employees have been informed about the hospital's achievements.	0.67				
8	The benchmarking between the hospital and others are done to learn from other experiences.	0.64				
9	The hospital is strongly committed in applying the concept of TQM at all administrative levels.	0.63				
10	The employees' satisfaction, health and work environment are very important.	0.58				
11	The quantities techniques are used in the planning for health services.	0.50				
12	The quality problems are usually resolved.	0.49				
13	Teamwork has improved the relationship among employees.		0.77			
14	The teams have improved the work and created new ideas.		0.73			
15	The teamwork has developed the work process.		0.73			
16	The teamwork has improved the patient satisfaction as well as the quality of services.		0.69			
17	Working in teams is more important than individuals.		0.64			
18	Different teamwork has been developed to improve the quality of services and to solve problems.		0.60			
19	The team works in the hospital from all administrative and clinical levels.		0.57			
20	The problems are resolved by building teamwork.		0.55			
21	The provided training programs fit the need of employees.			0.77		
22	Every employee has a chance to enter into training programs.			0.73		
23	The employees have chances to be trained in improving the quality of health care services.			0.72		
24	Training works on the improvement of employees' performance			0.70		
25	The employee has been trained in their job duties and skills.			0.69		
26	Training works on the improvement of health services.			0.68		
27	The top management creates a strong feeling in the employees about the hospital responsible for the society.				0.74	
28	The top management is committed to apply TQM.				0.71	
29	The top management believes in the TQM and makes continuous efforts to display its principles and ideas.				0.70	
30	The top management educates the employees about the TQM.				0.69	
31	The top management illustrates the advantages of applying TQM for hospital and employees.				0.67	
32	The top management support employees' suggestion to improve health care quality.				0.61	
33	The top management encourages all administrative levels in decision-making.				0.56	
34	The top management supports the training programs for employees.				0.51	
35	The work process is designed to satisfy the clients and met their needs.					0.81
36	The hospital administration takes under the consideration the clients' complaints and notices.					0.76
37	The top management work on the improvement of the services.					0.72
38	The clients' satisfaction is very important in every hospital activity.					0.71
39	Many instruments such as questionnaires have been used to know about clients' satisfaction.					0.71
40	The hospital administration evaluates periodically the health services to ensure the clients' satisfaction.					0.56

C1: Continuous improvement; C2: Teamwork; C3: Training; C4: Top management commitment; C5: Customer focus

Examining the effect of nurses' socio-demographic variables on the extent of applying TQM principles

The question of the study, which is the effect of nurses' socio-demographic variables on applying the TQM principles, was derived from factor analysis. Subsequently, multiple regression analysis was used regarding the nurses' socio-demographic variables (such as gender, age, educational level, experience, work department, daily average number of patients, and availability of a TQM department) as independent variables. Meanwhile, the extent of TQM factors implementation was regarded as the dependent variable in each time separately (Table 3).

Regression analysis results showed statistically significant positive correlations between continuous improvement, teamwork, training and top managerial commitment with the availability of TQM department as the P-values was 0.001, 0.015, 0.001 and 0.001, respectively. Demographic

variables (gender, age, education, experience department) did not show any significant difference with the implementation of TQM principles.

Discussion

The findings of this study were discussed in relationship to the availability of a TQM unit and the extent of TQM principle implementation in other sectors and Middle East countries.

Five principles of TQM were identified in this study, representing 70% of the extent of implementing TQM, which consisted of the following: continuous improvement, teamwork, training, top management commitment and customer focus, ranging from 41.6% to 53.9% of 40 items. Customer focus was the most implemented principle (mean 53.9%), and continuous improvement was the least implemented (mean 41.6%).

These results were supported by Al-Omar,¹³ who identified four principles: continuous improvement,

Table 3: Descriptive data and variance analysis (F test) for the differences among the hospitals under study in implementing TQM.

Factor	Hospital	Min.	Max.	Mean \pm S.D	F-value	P-value	Pair difference
Continuous improvement	University	0.00	89.6	36.5 \pm 22.8	10.1	0.0001	3 vs. 1,2,4
	Governmental	0.00	79.2	38.7 \pm 23.0			
	Private	10.4	100	57.9 \pm 22.0			
	Military	0.00	83.3	44.6 \pm 21.3			
	Total			41.6 \pm 23.2			
Teamwork	University	0.00	96.9	48.1 \pm 24.7	9.0	0.0001	3 vs. 1,2,4
	Governmental	0.00	100	46.3 \pm 23.1			
	Private	18.8	100	69.1 \pm 18.7			
	Military	0.00	100	51.6 \pm 24.1			
	Total			51.0 \pm 24.5			
Training	University	0.00	100	42.8 \pm 24.3	4.9	0.002	3 vs. 1,2
	Governmental	0.00	91.7	40.0 \pm 22.2			
	Private	0.00	83.3	57.2 \pm 22.9			
	Military	0.00	83.3	47.3 \pm 22.1			
	Total			44.9 \pm 23.4			
Top manager commitment	University	0.00	90.6	45.2 \pm 21.9	5.0	0.002	3 vs. 1,2 2 vs. 4
	Governmental	0.00	96.9	41.5 \pm 22.7			
	Private	12.5	100	58.5 \pm 23.1			
	Military	0.00	96.9	50.9 \pm 25.0			
	Total			47.1 \pm 23.6			
Customer focus	University	0.00	100	52.8 \pm 22.6	5.7	0.001	3 vs. 1,2,4
	Governmental	0.00	95.8	51.5 \pm 21.8			
	Private	29.2	95.8	68.81 \pm 14.7			
	Military	0.00	75.0	52.3 \pm 21.2			
	Total			53.9 \pm 21.7			

Bold figures reflect the mean and SD for each principle.

decision-making depending on the data, top management commitment and customer focus. These principles altogether explained 65% of the variance with 26 items. Customer focus was the highest implemented principle (mean 3.78 out of 5), and the least implemented principle was decision-making depending on the data (mean 3.46 out of 5).

These results were supported by Lee, Khong, Ghista, Mohammad Mosadegh Rad,¹¹ who found that implementation of TQM was very low and was affected by management process, focus on customers, leadership and management. Process management was the highest level in application, and the lowest was focus on employees.

This is consistent with the findings of other studies.¹⁴ The findings of this study support the findings of Morrow, who extracted three principles of TQM: teamwork, customer focus and continuous improvement. These three principles explained 58% of the variance with 12 items. The highest implemented principle was continuous improvement (3.36 out of 5), followed by customer focus (3.05) and finally teamwork (2.59).¹⁵ These studies explained that there is a response to the customer needs. Furthermore, they identified the importance of customer satisfaction in the success of any organization. The philosophy of quality in health services has four features: output quality, which consists of meeting customer expectations; the use of prospective and retrospective methods for evaluating and monitoring; the responsibility of all and the focus on input, process and outcomes.¹⁶

The results of this study indicate that a full and complete value of TQM might not yet be fully appreciated. We have concluded that the extent of implementing TQM in the Jordanian hospitals is very poor. This result is inconsistent with the work conducted by other researchers.^{16,17}

Poor implementation may be attributed to deficient knowledge about the importance of TQM and insufficient training programs and financial support for improving health services and patient satisfaction. The private sector has implemented TQM more than other sectors; the same results were reached by Al-Neyadi.¹⁸ This may be related to competition, higher efforts to gain customer satisfaction and efforts to increase profit at private hospitals.

No relationship was found between the extent of implementing TQM and socio-demographic variables (gender, age, education level, experience, work department, and number of patients served daily) except for the availability of a TQM unit. In other words, the degree of TQM implementation was increased by the availability of a quality unit. There is a significant difference related to the availability of quality unit and the extent of implementing TQM. This result is consistent with Al-Lozi,¹⁷ who found no significant difference related to sex, age, and employee level in the extent of TQM implementation.

A significant difference related to education level, experience, and the academic speciality was observed.¹⁴ This is also consistent with the study by Taamneh.¹⁶ Other studies used different ways to measure the extent of TQM implementation in hospitals or other organizations.

The limitation of the study was its cross-sectional design and the sample size of the private sector was small compared with others related to the worry of the large hospital for their competition position in case the result does not satisfy them.

Conclusion

The present study concluded that factor analysis extracted the following five principles of TQM implementation in

hospitals: continuous improvement, teamwork, training, top management commitment and customer focus. The principles of TQM are poorly implemented in Jordanian hospitals. Customer focus is the most widely implemented principle. The private sector has implemented more of the principles of TQM when compared with public sectors. The study also found no significant difference related to socio-demographic variables (gender, age, education level, experience, work department, and number of patients served daily) in hospitals that do not have a quality department. The degree of TQM implementation is improved by the availability of a quality department.

Conflict of interest

The authors have no conflict of interest to declare.

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