Developing and validating a total quality management model for healthcare organisations

Ali Mohammad Mosadeghrad
School of Public Health, Tehran University of Medical Sciences, Tehran, Iran

Abstract

Purpose – The purpose of this paper is to develop a total quality management (TQM) model for healthcare organisations and validate it using a sample of Iranian healthcare organisations.

Design/methodology/approach – A validated questionnaire was used to collect data from all healthcare organisations that implemented TQM in Isfahan province, Iran.

Findings – Using the proposed model, TQM implementation was measured in healthcare organisations. The level of TQM success in Isfahan healthcare organisations was medium. The highest score was achieved in the dimension of "customer management", followed by "leadership" and "employee management". Employee management, information management, customer management, process management and leadership had the most positive effect on TQM success. Using a series of quality management techniques had "synergistic" effect on TQM success.

Practical implications – Top management support, effective management of human resources, full involvement of the entire workforce including physicians, education and training, team working, continuous improvement, a corporate quality culture, customer focus and using a combination of management techniques under a quality management system are necessary for TQM successful implementation.

Originality/value – A healthcare context-specific model of TQM was developed and tested and suggestions were provided for its successful implementation.

Keywords Total quality management, Success, Healthcare organizations

Paper type Research paper

Introduction

In the past two decades the acknowledgement of medical errors, leading to patient injury and even death, has generated potential healthcare legislation and consumer awareness about considering and integrating quality in healthcare (Becher and Chassin, 2001; Ruiz and Simon, 2004). Concepts like clinical governance, clinical effectiveness, clinical audit, peer reviews, accreditation and continuous professional development are examples of attempts to monitor and improve the quality of healthcare services. Many healthcare organisations utilised various industrial quality management strategies such as quality assurance, continuous quality improvement, total quality management (TQM), business process reengineering, six sigma and quality function deployment to improve the quality of care.

TQM enables healthcare organisations to identify customer requirements, benchmark for best practices and improve processes to deliver appropriate care and reduce the frequency and severity of medical errors. TQM implementation may lead to higher quality care, improved patient satisfaction, better employee morale and increased productivity and profitability (Alexander et al., 2006; Cauchick Miguel, 2006; Kunst and
Lemmink, 2000; Macinati, 2008). The TQM success in industry has encouraged healthcare managers to examine whether it can work in the health sector. Accordingly, many healthcare organisations increasingly implemented TQM principles to improve the quality of outcomes and efficiency of healthcare service delivery (Boerstler et al., 1996; Kunst and Lemmink, 2000; Macinati, 2008).

Iran healthcare system faces serious challenges concerning efficiency and quality (Aghamollaei et al., 2007; Mohammadi and Shoghli, 2008; Tabibi et al., 2009). Reports of the successful TQM implementation in the world encouraged Iranian policy makers to introduce this strategy to healthcare organisations there in the hope of improving quality and efficiency. Consequently, TQM has been implemented in several healthcare organisations in the country (Askarian et al., 2010; Hamidi and Tabibi, 2004; Mohammadi et al., 2007). Many managers began to apply the concept of TQM within healthcare organisations using the Deming quality improvement approach called FOCUS-PDCA. Besides, ISO 9001:2000 quality management system was accepted as a model for TQM implementation (Mosadeghrad, 2014).

Despite numerous attempts to incorporate TQM/CQI in Iranian healthcare organisations, relatively little is known about its effectiveness. In order to bridge this gap, an investigation into the effects of TQM implementation in Iranian healthcare organisations is truly needed. Such a study helps in identifying problem areas and possible remedies.

**Theoretical framework**

Many researches were undertaken investigating TQM critical success factors during the last two decades (Black and Porter, 1996; Dayton, 2001; Metri, 2005; Sila and Ebrahimpour, 2002). All of these researchers developed their TQM frameworks based on their own research purposes. TQM is a western management concept, which evolved out of Japanese management practices. Hence, it may not integrate well into a different context (e.g., Iran) and industry (e.g., health). Each organisation may require different approaches for TQM implementation (Mosadeghrad, 2013). Indeed, many of the theories developed in the western developed countries may need to be reassessed in developing countries such as Iran. For instance, Iran according to Hofstede’s (2003) cross-cultural dimensions, highly scored on “power distance” and “uncertainty avoidance”. Therefore, the country may need a different quality management model compared to Denmark which scored low on both.

Thus, an extensive review of literature on quality management models and frameworks was performed to identify critical factors for successful TQM implementation in healthcare. A generic model of TQM has been proposed based on the literature review and informal interviews with quality management experts (see Figure 1). From each study, a list of constructs of TQM was created. Quality management experts’ opinions were used in completing this list. In total, 15 most common constructs of TQM were chosen for inclusion in the model, of which ten are enablers and five are results. Enablers direct and drive the results. The model starts from the logical point of leadership and management and ends with overall performance results. The belief is that “excellent results with respect to organisation, customer, employee, supplier and society are achieved through leadership and management, strategic quality planning, quality culture, education and training, employee management, customer management, supplier management, resource management, information management and process management”.

**Leadership and management**

The success of TQM depends largely on managers’ ability to create a vision, plan for and lead the organisational change required for TQM success. The literature both
in general industry and healthcare, addressed and emphasised the importance of visionary leadership, including philosophy, style and behaviour in the implementation process of TQM initiatives (e.g. Kunst and Lemmink, 2000; Mosadeghrad, 2005). The leadership and management construct examines how senior managers as leaders are personally involved in developing and implementing a quality management system, inspire and drive the quality management change and support a culture of continuous improvement. Accordingly, I postulate:

**P1.** Leadership and management are positively and significantly related to organisational performance.

**Strategic quality planning**
Quality improvement can only result from planned management action. The successful implementation of TQM requires careful strategic planning based on total quality. Including specific objectives for quality, as part of the strategic planning process, is associated with the degree of TQM success (Dayton, 2001; Francois et al., 2003; Taylor and Wright, 2003). Healthcare managers should integrate quality as a strategic priority in their organisations’ vision, policies and long-term strategies through a strategic quality planning process. The strategic quality planning construct examines how managers sets strategic directions, establishes a long-term vision, develops the values required for long-term success, sets strategic goals and objectives, incorporates quality in the strategic goals and objectives and implements these via appropriate strategies, policies and action plans. Thus, I propose:

**P2.** Strategic quality planning is positively and significantly related to organisational performance.

**Quality culture**
TQM requires changes in managers’ and employees’ believes, attitudes and behaviours to focus on continuous improvement. Successful implementation of TQM requires a significant commitment to a culture emphasising trust, empowerment, entrepreneurship, teamwork, cooperation, risk taking and continuous improvement (Kaluarachchi, 2010; Mosadeghrad, 2006; Wardhani et al., 2009). TQM programmes are more likely to succeed if the prevailing organisational culture is compatible with the values and basic
assumptions proposed by the TQM discipline (Kujala and Lilirank, 2004). The quality culture construct examines how managers develop a nurturing organisational culture that supports quality. Hence, the following proposition is proposed:

**P3.** Quality culture is positively and significantly related to organisational performance.

**Education and training**
Continuous and widespread education and training provide a good foundation for cultural change required for TQM implementation. Education and training help develop employees’ capabilities on a continuous basis. The review of literature corroborates the importance of appropriate education and training in the process of TQM implementation (Goetsch and Davis, 2010; Palo and Padhi, 2003; Yusof and Aspinwall, 2000). The education and training construct examines how managers recognises and nurtures the development of employees’ abilities, skills and knowledge. Accordingly, I propose:

**P4.** Education and training are positively and significantly related to organisational performance.

**Employee management**
Employee empowerment, commitment and involvement in quality management are key factors in successful implementation of TQM and were indeed included in previous TQM studies (Lee and Quazi, 2001; Metri, 2005; Soltani et al., 2003). The employee management construct examines how managers develop and manage the capabilities of people at individual, team-based and organisational levels, promote fairness and equality, involve, encourage and enable people to contribute to the achievement of the organisational goals and recognise their achievements. I propose then:

**P5.** Employees management is positively and significantly related to organisational performance.

**Customer management**
Many quality gurus and writers considered customer-driven quality a major success factor of the TQM effort (Crosby, 1992; Deming, 1986; Oakland, 2003). Systems and processes must be in place to identify customer needs, translate these needs into appropriate organisational requirements and satisfy them. The customer management construct examines how the organisation builds relationships with customers, determines customers’ requirements and expectations and measures their satisfaction, and uses the feedback of customers in improving quality of services. Thus, the following proposition is offered:

**P6.** Customer management has a positive influence on organisational performance.

**Supplier management**
On an average, 40 per cent of production cost is due to purchased materials (Besterfield, 1994). On the other hand, purchased materials are often a major source of quality problems (Zhang et al., 2000). Thus, supplier management is an important aspect of TQM. An effective supplier management reduces procurement costs and enhances the quality of purchased products (Slaint, 1999). The supplier management construct examines how the organisation manages suppliers effectively and efficiently to support key organisation processes, policies, strategies and action plans. Therefore, I expect:

**P7.** Suppliers management has a positive influence on organisational performance.
Resource management
Quality improvement requires additional investments in time, capital and resources to develop an appropriate infrastructure for quality. Allocation of resources (i.e. human, equipment and material) is necessary for delivering desired healthcare services to meet customer needs. Managers are responsible to provide appropriate resources to make the implementation of TQM successful. An effective resource management system enhances efficiencies, improves safety and reduces errors. The resources management construct examines how the organisation manages its internal physical resources effectively and efficiently to support key organisation processes. The following proposition is therefore proposed:

P8. Resource management has a positive influence on organisational performance.

Information management
Fundamental to TQM is collecting accurate, timely, reliable and relevant data and information from both inside and outside the organisation for assessing, improving and evaluating purposes (Joss and Kogan, 1995; O’Brien et al., 1995). Such information is necessary for the appropriate usage of resources, identification of customer requirements, evaluating the effectiveness and efficiency of the operations and determining the cause of quality problems. Several studies reported that a lack of good information system and information required for quality management influenced the success of quality improvement (Lee et al., 2002; Shortell et al., 1998). Thus, it is hypothesised that:

P9. Information management has a positive influence on organisational performance.

Process management
TQM focuses on studying, understanding and improving the processes. Process management concerns the value adding system and involves the policies, procedures and practices that are required to control the process. Many TQM writers have pointed out the importance of focusing on the effective management of processes (Beskese and Cebeci, 2001; Flynn et al., 1994; Oakland, 2003). The process management construct examines how key processes are designed, implemented, managed and improved to support the organisation’s strategy and action plans, fully satisfy customers and other stakeholders and achieve better performance. Therefore, I propose:

P10. Process management has a positive influence on performance results.

Methodology
Purpose
The purpose of this study was to explore the impact of TQM in Iranian healthcare organisations. In addition, this study sought to identify critical success factors of TQM implementation.

Method
The data for this research were drawn from a cross-sectional questionnaire survey collected from healthcare organisations that implemented TQM initiatives.

Settings and participants
Managers or quality managers of healthcare organisations (e.g. hospitals and health centres) in both public and private sectors in Isfahan province, Iran were asked to
participate in this survey. Healthcare organisations were categorised into three groups: small (with less than 100 employees), medium (with 101-500 employees) and large sized (with more than 500 employees).

**Questionnaire development**

The survey questionnaire was divided into two sections. The first section sought general information about the healthcare organisations and demographic information of the respondents. In the second section of the survey, the degree of TQM implementation in each organisation was measured. Three different types of validity were tested in this study (i.e. content validity, construct validity and criterion-related validity). In this research, 15 TQM constructs have content validity since they were derived from an extensive review of the literature, and detailed evaluations by academics and practitioners who have worked in the area of TQM in Iran.

The construct validity of each TQM construct was evaluated separately by factor analysing the items corresponding to the construct to ensure that items in each construct reflected sufficiently the scope of each construct. Based on factor analysis, the initial 52 variables in TQM success questionnaire are factored on to 15 TQM element constructs. All the constructs were uni-factorial; and the item loading range for each extracted factor was high. Each factor accounted for more than 70 per cent of the variance of the respective item sets. Results of the factor analysis indicate a high level of construct validity of the measure. Table I lists the correlation matrix for the 15 scales of the TQM implementation practices.

TQM constructs can have criterion-relation validity if the collective measure of the TQM practices is highly and positively correlated with a measure of quality performance. In this study, the ten TQM practices (enablers) are the predictors and the five performance measures are the relevant criteria. The correlation coefficient obtained was more than 70 per cent. These correlations were statistically significant at $p < 0.001$, indicating strong criterion-related validity. In addition, the questionnaire was administered to three ISO certified hospitals. It was found that on all the questions in the final draft of the questionnaire, a high total score was obtained by the ISO certified hospitals. This was indicative of the criterion validity of the instrument.

<table>
<thead>
<tr>
<th>Scales</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership and management</td>
<td>0.717</td>
<td>0.777</td>
<td>0.764</td>
<td>0.703</td>
<td></td>
</tr>
<tr>
<td>Strategic quality planning</td>
<td>0.743</td>
<td>0.851</td>
<td>0.872</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality culture</td>
<td>0.798</td>
<td>0.707</td>
<td>0.712</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education and training</td>
<td>0.786</td>
<td>0.703</td>
<td>0.772</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee management</td>
<td>0.781</td>
<td>0.716</td>
<td>0.812</td>
<td>0.798</td>
<td>0.816</td>
</tr>
<tr>
<td>Customer management</td>
<td>0.764</td>
<td>0.710</td>
<td>0.727</td>
<td>0.754</td>
<td>0.791</td>
</tr>
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<td>0.716</td>
<td>0.722</td>
<td>0.733</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource management</td>
<td>0.872</td>
<td>0.848</td>
<td>0.798</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information management</td>
<td>0.771</td>
<td>0.737</td>
<td>0.785</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process management</td>
<td>0.733</td>
<td>0.796</td>
<td>0.800</td>
<td>0.824</td>
<td>0.712</td>
</tr>
<tr>
<td>Employee results</td>
<td>0.841</td>
<td>0.734</td>
<td>0.711</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Customer results</td>
<td>0.830</td>
<td>0.733</td>
<td>0.715</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier results</td>
<td>0.820</td>
<td>0.809</td>
<td>0.771</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Society results</td>
<td>0.817</td>
<td>0.764</td>
<td>0.753</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisation results</td>
<td>0.760</td>
<td>0.720</td>
<td>0.780</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table I. Item to scale correlation matrix (Pearson correlation)
Cronbach’s $\alpha$ was computed separately for the items of each scale. As shown in Table II, Cronbach’s $\alpha$ values of the 15 TQM constructs all exceed the 0.70 standard of reliability for survey instrument. Accordingly, the instrument has been proven to be an acceptable and reliable instrument through this test.

A five-point response scale was used for these items (from 1 = very little extent to 5 = very large extent). The possible justified scores for TQM success were varied between 1 and 5. Scores of 2 or lower on the total scale indicate very low, scores between 2 and 2.75 indicate low, scores between 2.76 and 3.50 indicate moderate, scores between 3.51 and 4.25 indicate high and scores of 4.26 or higher indicate very high TQM success.

**Data analysis**
The data were analysed using the Statistical Package for the Social Sciences (SPSS 11). Descriptive statistics such as means and standard deviations were computed for each of the questionnaire items. Independent-samples $t$-test and analysis of variance were performed to determine the significance of the difference among means of the considered groups. Regression analysis was used to identify the most important predictor domains in overall TQM success. A confirmatory factor analysis using AMOS software was used to test the TQM model.

**Hypothesis development**
A test value of 3.50 was decided based on the Likert scale coding method of the questionnaire. Hypothesis can be written in a statistical equation as follows:

$$H1. \mu \geq 3.50 \text{ (TQM is successful)}$$

**Results**
Out of 90 questionnaires sent to the healthcare organisations, 55 questionnaires were returned and were analysed (61 per cent). In total, 33 organisations were hospitals and the rest were health centres. In total, 41 (74.5 per cent) of healthcare organisations were...
public organisations. Of the total, 7.3, 78.2 and 14.5 per cent of healthcare organisations were small-, medium- and large-sized organisations. Three hospitals were successful in obtaining ISO 9001:2000 certificates.

The majority of respondents were in their 30s and held either a bachelor or a master degree. Totally, 67.3 per cent of respondents had taken part in TQM, 40 per cent in ISO 9000 series, 38.2 per cent in productivity management, 25.5 per cent in human resource management, 18.1 per cent in statistical quality control tools, 14.5 per cent in quality costing, 9.1 per cent in six sigma and 7.2 per cent in EFQM-training programmes.

The mean score of TQM success in healthcare organisations was 3.41 (medium) from five credits compared with the possible range of 2.06-4.17 (Table III). It can be seen that the sample mean of 3.41 is lower than the hypothesised value of 3.50. A p-value of 0.180 was determined which suggests that the null hypothesis is accepted (one-sample t-test). Hence, it can be concluded that TQM was not successful in Iranian healthcare organisations.

The overall mean is below 4.0 on all of the TQM constructs, indicating that these aspects of implementation are not well executed in any of these healthcare organisations. TQM practices (enablers) and results (performance) received mean ratings of 3.44 and 3.34, respectively. Of the 15 TQM constructs in Table II, customer management received the highest mean score of 3.69 and 70.9 per cent of the organisations achieved a high score for this construct. Supplier management was rated lowest.

Private healthcare organisations were more successful in their TQM programme than their public counterparts (3.53 compared to 3.38). However, the difference was not statistically significant (p = 0.292). Although statistically insignificant (p = 0.257), it was observed that the TQM implementation score was lower as the size of the organisation increases, indicating that smaller organisations tend to implement TQM more successfully than larger ones.

The mean score of TQM success in healthcare organisations, in which their top managers were strongly committed to quality management, was higher than other organisations with lower top management commitment (3.47±0.39 in comparison with 3.09±0.76). The differences between the values were statistically significant (p = 0.04).

<table>
<thead>
<tr>
<th>TQM constructs</th>
<th>Mean score</th>
<th>SD</th>
<th>Low (&lt;2.75)</th>
<th>Medium (2.75-3.50)</th>
<th>High (3.51-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership and management</td>
<td>3.59</td>
<td>0.53</td>
<td>12.7</td>
<td>27.3</td>
<td>60.0</td>
</tr>
<tr>
<td>Strategic quality planning</td>
<td>3.24</td>
<td>0.68</td>
<td>20.0</td>
<td>38.2</td>
<td>41.8</td>
</tr>
<tr>
<td>Quality culture</td>
<td>3.46</td>
<td>0.49</td>
<td>9.1</td>
<td>36.4</td>
<td>54.5</td>
</tr>
<tr>
<td>Education and training</td>
<td>3.43</td>
<td>0.59</td>
<td>18.2</td>
<td>30.9</td>
<td>50.9</td>
</tr>
<tr>
<td>Employee management</td>
<td>3.56</td>
<td>0.58</td>
<td>9.1</td>
<td>27.3</td>
<td>63.6</td>
</tr>
<tr>
<td>Customer management</td>
<td>3.69</td>
<td>0.56</td>
<td>5.5</td>
<td>23.6</td>
<td>70.9</td>
</tr>
<tr>
<td>Supplier management</td>
<td>3.12</td>
<td>0.64</td>
<td>27.3</td>
<td>41.8</td>
<td>30.9</td>
</tr>
<tr>
<td>Resource management</td>
<td>3.18</td>
<td>0.72</td>
<td>25.5</td>
<td>32.7</td>
<td>41.8</td>
</tr>
<tr>
<td>Information management</td>
<td>3.38</td>
<td>0.54</td>
<td>18.2</td>
<td>32.7</td>
<td>49.1</td>
</tr>
<tr>
<td>Process management</td>
<td>3.45</td>
<td>0.59</td>
<td>10.9</td>
<td>43.6</td>
<td>45.5</td>
</tr>
<tr>
<td>Employee results</td>
<td>3.35</td>
<td>0.56</td>
<td>18.2</td>
<td>34.5</td>
<td>47.3</td>
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<tr>
<td>Customer results</td>
<td>3.39</td>
<td>0.54</td>
<td>16.4</td>
<td>32.7</td>
<td>50.9</td>
</tr>
<tr>
<td>Supplier results</td>
<td>3.20</td>
<td>0.66</td>
<td>23.6</td>
<td>38.2</td>
<td>38.2</td>
</tr>
<tr>
<td>Society results</td>
<td>3.41</td>
<td>0.58</td>
<td>10.9</td>
<td>43.6</td>
<td>45.5</td>
</tr>
<tr>
<td>Organisation results</td>
<td>3.37</td>
<td>0.57</td>
<td>16.4</td>
<td>32.7</td>
<td>50.9</td>
</tr>
<tr>
<td>Overall TQM success</td>
<td>3.41</td>
<td>0.47</td>
<td>12.7</td>
<td>30.9</td>
<td>56.4</td>
</tr>
</tbody>
</table>

Table III. The mean score of TQM principles’ success in Isfahan healthcare organisations.
The Pearson correlation matrix shows that top management support is significantly correlated with both TQM practices ($r = 0.714, p < 0.0001$) and organisational performance ($r = 0.626, p < 0.0001$). Top management commitment has been significantly correlated with other TQM constructs such as strategic quality planning ($r = 0.727$), employee management ($r = 0.664$), education and training ($r = 0.570$) and quality culture ($r = 0.537$). This shows that top management plays a critical role in promoting TQM implementation in the organisation.

There are associations between TQM success and the manager’s education in quality management techniques. The more knowledge managers had about TQM, the greater was their commitment to quality ($r = 0.303, p = 0.041$). Employee involvement and commitment was also related to management commitment ($r = 0.369, p = 0.006$). Organisations with the greatest emphasis on employee empowerment achieved a higher implementation score (3.62) than those with medium (3.26) and low degrees of empowerment (2.42). The differences between values of TQM implementation were statistically significant ($p < 0.001$).

The mean score of TQM success in ISO 9000 certified organisations was $3.95 \pm 0.24$ while in non-ISO 9000 certified organisations was $3.38 \pm 0.47$. Significant differences were observed between values ($p = 0.04$). The ISO certified organisations mean scores are higher on all TQM constructs, and significantly higher on five constructs (Table IV).

A majority of the respondents (80 per cent) were found to have adopted participative management techniques in their organisations. The second highest degree of practice was business process reengineering (27.3 per cent). Total productive maintenance (TPM) was the least preferred and implemented technique in the healthcare organisations (10.9 per cent). Quality management systems (e.g. ISO 9001:2000) was found to be the most useful activity in TQM success. Managers who incorporated and used a number of techniques and tools achieved more success from their TQM programme. For example, the success of TQM in organisations that used one, two, three, four, five, six and eight different managerial techniques was 3.13, 3.29, 3.44, 3.60, 3.71, 3.80 and 4.17 on a five scale, respectively.

### Table IV.

<table>
<thead>
<tr>
<th>TQM constructs</th>
<th>ISO 9000 certified</th>
<th>Non-ISO 9000 certified</th>
<th>$p$-value</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leadership and management</td>
<td>3.67</td>
<td>3.58</td>
<td>0.79</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Strategic quality planning</td>
<td>3.25</td>
<td>3.23</td>
<td>0.97</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Corporate quality culture</td>
<td>3.56</td>
<td>3.46</td>
<td>0.73</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Education and training</td>
<td>4.44</td>
<td>3.37</td>
<td>0.002</td>
<td>Sig.</td>
</tr>
<tr>
<td>Employees management</td>
<td>4.13</td>
<td>3.52</td>
<td>0.08</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Customer management</td>
<td>3.80</td>
<td>3.68</td>
<td>0.74</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Supplier management</td>
<td>3.67</td>
<td>3.08</td>
<td>0.13</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Resource management</td>
<td>3.89</td>
<td>3.13</td>
<td>0.08</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Information management</td>
<td>4.11</td>
<td>3.34</td>
<td>0.015</td>
<td>Sig.</td>
</tr>
<tr>
<td>Process management</td>
<td>4.73</td>
<td>3.38</td>
<td>0.001</td>
<td>Sig.</td>
</tr>
<tr>
<td>Employee results</td>
<td>3.67</td>
<td>3.33</td>
<td>0.32</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Customer results</td>
<td>3.89</td>
<td>3.37</td>
<td>0.10</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Supplier results</td>
<td>3.78</td>
<td>3.17</td>
<td>0.12</td>
<td>Not sig.</td>
</tr>
<tr>
<td>Society results</td>
<td>4.11</td>
<td>3.37</td>
<td>0.030</td>
<td>Sig.</td>
</tr>
<tr>
<td>Organisation results</td>
<td>4.11</td>
<td>3.33</td>
<td>0.020</td>
<td>Sig.</td>
</tr>
<tr>
<td>Overall TQM success</td>
<td>3.95</td>
<td>3.38</td>
<td>0.04</td>
<td>Sig.</td>
</tr>
</tbody>
</table>

**Note:** Comparison between ISO 9000 certified against non-ISO 9000 certified healthcare organisation.
In this study, 15 constructs of TQM were investigated, of which ten were enablers and five were results. Table V shows the correlation coefficients for TQM constructs. All the correlations among the TQM constructs were found to be positive and statistically significant at $p < 0.01$. The correlations among the TQM constructs provide an indication of the extent to which they reinforce one another in the TQM effort. Therefore, an integrated approach should be taken to improve the TQM constructs.

Leadership has shown to have a direct impact on strategic planning and significant indirect effects on process management and organisation results. The impact of strategic quality planning on process management and overall performance has been validated through indirect effects. Quality culture has demonstrated to have a strong influence on employee, customer and supplier management and indirect effects on process management. Teamwork and a participatory culture were positively related to employee empowerment and involvement in quality improvement activities ($r = 0.446$, $p = 0.001$). Process management was observed to be related to customer satisfaction ($r = 0.310$, $p = 0.02$). The TQM implementation had a strong impact on quality improvement ($r = 0.739$, $p < 0.001$).

All quality management practices (enablers) were positively associated with TQM success. The results of the stepwise regression analysis indicate that employee management has the largest amount of variance in TQM success (81 per cent), followed by information management, customer management, process management, leadership, resource management, training, strategic quality planning and supplier management.

The most important contributing factors to successful TQM implementation in healthcare organisations were considering customer needs in process improvement activities, improving relationships between employees and managers, encouraging innovation and creativity, developing a participatory culture, customer relationship management, pursuing long-term organisational goals and policies, identifying and defining processes, management involvement in quality improvement activities and having an information management system.

Higher levels of TQM practices implementation were found to be associated with higher organisational performance ($r = 0.914$, $p < 0.001$). TQM enablers were categorised into primary (initial) enablers (i.e. employee, customer, supplier, resource, information and process management) and secondary (supportive) enablers (i.e. leadership, strategic quality planning, quality culture and education and training). Both initial and supportive enablers of TQM were inter-correlated and both jointly enhanced performance. There was significant correlation between organisational performance and initial enablers ($r = 0.811$) and supportive enablers ($r = 0.609$).

The results of the stepwise regression model indicate that 83 per cent of the variance in overall organisational performance is explained by employee management, information management, customer management and process management. The variables – considering customer needs in process improvement activities, developing mission and vision according to customer needs, having an information management system, continuous quality improvement and human resource development – are the most influential TQM dimensions for improving organisational performance.

Figure 2 shows the relationships among TQM practices and overall organisational performance. The results of the stepwise regression model indicate that 53 per cent of the variance in employee results is explained by Employee management and Leadership. Customer results are related to Process management, Education and training and Customer management and the corresponding value of $R^2$ is 55 per cent.
<table>
<thead>
<tr>
<th>TQM constructs</th>
<th>1</th>
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</thead>
<tbody>
<tr>
<td>1. Overall TQM success</td>
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<tr>
<td>2. Leadership and management</td>
<td>0.827</td>
<td></td>
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<tr>
<td>3. Strategic quality planning</td>
<td>0.813</td>
<td>0.785</td>
<td></td>
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<tr>
<td>4. Quality culture</td>
<td>0.763</td>
<td>0.740</td>
<td>0.760</td>
<td></td>
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<tr>
<td>5. Education and training</td>
<td>0.799</td>
<td>0.600</td>
<td>0.644</td>
<td>0.624</td>
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<tr>
<td>6. Employees management</td>
<td>0.902</td>
<td>0.722</td>
<td>0.782</td>
<td>0.712</td>
<td>0.720</td>
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<tr>
<td>7. Customer management</td>
<td>0.810</td>
<td>0.692</td>
<td>0.656</td>
<td>0.653</td>
<td>0.518</td>
<td>0.707</td>
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<tr>
<td>8. Supplier management</td>
<td>0.712</td>
<td>0.616</td>
<td>0.546</td>
<td>0.578</td>
<td>0.591</td>
<td>0.640</td>
<td>0.668</td>
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<tr>
<td>9. Resource management</td>
<td>0.634</td>
<td>0.450</td>
<td>0.434</td>
<td>0.526</td>
<td>0.546</td>
<td>0.608</td>
<td>0.516</td>
<td>0.629</td>
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<tr>
<td>10. Information management</td>
<td>0.765</td>
<td>0.625</td>
<td>0.580</td>
<td>0.471</td>
<td>0.660</td>
<td>0.611</td>
<td>0.535</td>
<td>0.515</td>
<td>0.506</td>
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<tr>
<td>11. Process management</td>
<td>0.837</td>
<td>0.606</td>
<td>0.572</td>
<td>0.527</td>
<td>0.736</td>
<td>0.498</td>
<td>0.750</td>
<td>0.683</td>
<td>0.614</td>
<td>0.710</td>
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<tr>
<td>12. Employee results</td>
<td>0.730</td>
<td>0.548</td>
<td>0.591</td>
<td>0.571</td>
<td>0.513</td>
<td>0.701</td>
<td>0.617</td>
<td>0.681</td>
<td>0.464</td>
<td>0.414</td>
<td>0.558</td>
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<tr>
<td>13. Customer results</td>
<td>0.797</td>
<td>0.713</td>
<td>0.684</td>
<td>0.479</td>
<td>0.621</td>
<td>0.652</td>
<td>0.646</td>
<td>0.589</td>
<td>0.499</td>
<td>0.624</td>
<td>0.651</td>
<td>0.512</td>
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<tr>
<td>14. Supplier results</td>
<td>0.666</td>
<td>0.683</td>
<td>0.627</td>
<td>0.557</td>
<td>0.688</td>
<td>0.632</td>
<td>0.675</td>
<td>0.642</td>
<td>0.578</td>
<td>0.714</td>
<td>0.624</td>
<td>0.576</td>
<td>0.761</td>
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<tr>
<td>15. Society results</td>
<td>0.689</td>
<td>0.491</td>
<td>0.423</td>
<td>0.384</td>
<td>0.523</td>
<td>0.560</td>
<td>0.630</td>
<td>0.567</td>
<td>0.446</td>
<td>0.548</td>
<td>0.527</td>
<td>0.440</td>
<td>0.575</td>
<td>0.624</td>
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<tr>
<td>16. Organisation results</td>
<td>0.626</td>
<td>0.645</td>
<td>0.551</td>
<td>0.591</td>
<td>0.622</td>
<td>0.679</td>
<td>0.618</td>
<td>0.611</td>
<td>0.603</td>
<td>0.737</td>
<td>0.772</td>
<td>0.558</td>
<td>0.626</td>
<td>0.645</td>
<td>0.559</td>
<td></td>
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<tr>
<td>17. TQM practices</td>
<td>0.993</td>
<td>0.841</td>
<td>0.827</td>
<td>0.796</td>
<td>0.809</td>
<td>0.916</td>
<td>0.803</td>
<td>0.820</td>
<td>0.719</td>
<td>0.755</td>
<td>0.838</td>
<td>0.704</td>
<td>0.757</td>
<td>0.835</td>
<td>0.636</td>
<td>0.807</td>
<td></td>
</tr>
<tr>
<td>18. Overall performance</td>
<td>0.894</td>
<td>0.645</td>
<td>0.554</td>
<td>0.409</td>
<td>0.613</td>
<td>0.734</td>
<td>0.674</td>
<td>0.572</td>
<td>0.591</td>
<td>0.602</td>
<td>0.738</td>
<td>0.669</td>
<td>0.818</td>
<td>0.681</td>
<td>0.658</td>
<td>0.793</td>
<td>0.914</td>
</tr>
</tbody>
</table>
The dependent variable of supplier results is related to Supplier management, Process management and Strategic planning, with an $R^2$ of 71 per cent. Society results are related to Customer management and Information management with an $R^2$ of 44 per cent. Organisation results are related to Process management, Resource management and Information management with an $R^2$ of 0.718 which indicates that 71 per cent of the variance of organisation results is explained by these three enablers. All dependent variables are predicted by a significant regression ($p < 0.001$).

**Discussion**

The findings suggest that TQM has not been fully successful in the healthcare organisations of Iran. This seems to be in agreement with other research findings on the application of TQM/CQI in healthcare (Huq and Martin, 2000; Lee et al., 2002; Theodorakioglou and Tsiotras, 2000). Implementing TQM in healthcare organisations requires an understanding of the particular nature of the sector, which influences the applicability of TQM practices. Due to the distinctive nature of healthcare services, there are incompatibilities between the TQM philosophy and the practices on which the management of healthcare organisations is currently based. The very complexity of the healthcare system and its bureaucratic, and highly departmentalised and hierarchical structure can pose a significant obstacle to the implementation of TQM and decrease its effectiveness (Adinolfi, 2003; Lim and Tang, 2000; Mosadeghrad, 2012a; Naveh and Stern, 2005).

The TQM constructs were also found to be highly interrelated. The interdependent nature of TQM constructs explains why TQM has not produced maximum benefits for Iranian healthcare organisations. Both primary and supportive TQM enablers (constructs) jointly enhance results (organisational performance). Therefore, it is necessary for all the TQM constructs to be present to ensure its success in an organisation. Higher levels of organisational performance were significantly correlated with great utilisation of TQM practices in Iranian healthcare organisations. These findings are consistent with those of Douglas and Judge (2001), who found that healthcare organisations with a greater degree of implementation of TQM practices have a greater probability of improving their organisational performance.
The finding showed that “primary” TQM elements have a more significant and positive impact on organisational performance, when compared to “secondary” TQM elements. This is not suggesting that “secondary” TQM constructs are not useful, but their direct contribution is less than that of “initial” TQM constructs. Secondary TQM elements are significant to support the “primary” TQM elements. Employee management, information management, customer management, process management and leadership were the strongest significant predictors of organisational performance. Therefore, the effective implementation of these practices is likely to result in improved performance. This finding is supported by Samson and Terzioukski (1999), who argue that categories of leadership, people management and customer focus are the strongest significant predictors of organisational performance. Sila and Ebrahimpour (2005) also found that leadership, and information and analysis carry strong implications in terms of a company’s business results.

A strong relationship between leadership and the success of TQM has been reported in this study. The findings also revealed that leadership has positive effects on organisational performance by influencing other TQM practices. The high correlation between leadership and management and each of the other constructs suggests that the former played an important role in driving the latter. Leadership and management had the most effect on strategic quality planning, quality culture, employee management and customer management. Sustainable top management involvement in TQM is vital for the success of TQM initiatives. The results have shown that for healthcare organisations in which managers were committed more to TQM, its success was greater than in other organisations with a less management commitment. This finding is consistent with the TQM literature (Balding, 2005; Mosadeghrad, 2005). Top management must be totally committed to TQM in both words and actions to sustain a long-term effort to improve performance.

Achieving and sustaining quality requires a long-term commitment to quality management. Quality should be recognised as an organisation’s strategic goal and should be reflected in the organisation’s corporate vision and mission. The current study shows that strategic quality planning had the most effect on quality culture, employee management and customer satisfaction. However, Iranian healthcare organisations use strategic quality planning to a lower extent. Managers should develop plans to implement quality management changes and control their effects. A strategic quality plan ensures the availability of resources for TQM implementation. It helps identify customers’ and other stakeholders’ requirements and then design strategies and action plans to achieve the goals and objectives. Without the integration of quality management with strategic and operational plans, it becomes yet another initiative.

Organisational culture influences the thoughts, feelings and interaction among people in an organisation (Boon et al., 2007). It acts as a force for cohesion in an organisation and therefore can support or inhibit the process of change towards the application of TQM (Sinclair and Collins, 1994; Tata and Prasad, 1998). Organisational culture must be congruent with TQM or TQM initiatives need to be modified to fit the Iranian (or other) culture and healthcare systems. Although quality culture had the most effect on organisation, employee and customer results, TQM implementation had the least effect on organisational culture of Iranian healthcare organisations. Organisational culture is difficult to change due to its deep-rooted nature. Therefore, some managers may invest less on developing a quality culture before implementing their TQM initiatives to avoid the employees’ resistance.

Insufficient training on quality was found to impede successful TQM implementation in Iranian healthcare organisations. The results have shown that education and training
were directly related to quality culture, employee management, process management, customer management and supplier management. A positive relationship between quality-related knowledge and managers’ involvement in and commitment to TQM was also found in this study. Therefore, it is necessary to ensure employees actually understand the values and principles of TQM, and are equipped with skills and knowledge required to improve the quality of their work. Education and training can result in a more satisfied workforce and an environment for innovation and creativity.

The findings of this study indicate that employee management is arguably the most important factor affecting the TQM programme. This finding is consistent with other studies claiming that employees have an important role in quality management success in service organisations (Agus, 2006; Dilber et al., 2005). Employees are the driving force of TQM success. Their active involvement in quality improvement activities plays critical role in TQM success. Findings of this study indicated that Employee management had the most effect on customer management, process management, resource management, employee results, society results, customer results and organisation results. The findings also suggest that those healthcare organisations emphasising employee empowerment are more likely to be successful in their implementation efforts. Financial incentives and non-monetary reward systems increase the effectiveness of TQM programmes. Employees should be rewarded for their efforts and successes at quality improvement. Managers should implement policies and programmes that link performance to the accomplishment of quality objectives at the organisational, group and individual levels (Allen and Kilmann, 2001).

TQM cannot exist without a strong customer focus. Customer focus is the foundation of the TQM philosophy. In fact, quality management cannot exist without a strong customer focus. The finding revealed that Customer management had the most effect on process management, customer results, and organisation results. These findings concurred with the assertions of other studies that concluded that effective customer management activities and focus on customers’ requirements could contribute towards the level of customer satisfaction (Mosadeghrad, 2012b; Terziovski, 2006).

Top management should establish effective information systems and encourage employees to use objective data in their decision processes. Information management had the most effect on process management, employee results, organisation results, customer results and supplier results in this study. The results also confirmed the empirical findings of several previous studies that suggest a positive link between information and analysis and customer satisfaction (Min et al. 2002; Ooi et al., 2011).

Allocating necessary resources are essential for TQM programmes to be continued effectively. Resource management had the most effect on process management, organisation results, supplier results and customer results. Supplier management emerged as an important construct of TQM, positively affecting process management, resource management, supplier results, organisation results and customer results. However, it was ranked as the least practiced by healthcare organisations. This indicates that a much greater emphasis must be given on supplier management in future quality improvement programmes. If organisations do not manage their suppliers properly, the chances of getting high quality materials and services will be lower and can result in lower quality healthcare services and higher total quality costs.

In TQM, the emphasis is on studying processes and improving them to provide customers with desired products and services. Process management, was found to have a positive significant impact on organisation results, customer results, employee results and supplier results in this study. Similarly, Kumar et al. (2008) found that process management is a critical driving force of customer satisfaction.
Another point worth mentioning here is that ISO certified hospitals have better quality management practices and enjoy better quality results. A quality management system such as ISO 9001:2000 could be a good first step towards TQM implementation, mainly because of raising awareness of quality among employees and improving processes through the development of work procedures (Gotzamani and Tsiotras, 2001; Martínez-Costa and Lorente, 2004). Therefore, implementing ISO 9000 and TQM jointly has more impact on organisational performance. However, there is still a long journey from ISO to TQM.

One encouraging finding from this study was that, where TQM was used with other management initiatives and strategies, these organisations were likely to have a greater appreciation of the benefits of TQM and a higher level of performance. The finding is supported by the earlier studies which show that using an integrated quality management model and applying several quality management practices in a complementary way is usually more effective than single practices (Dey and Hariharan, 2006; Revere and Black, 2003; Sun et al., 2004). Managers can use a number of quality management strategies and techniques and enjoy the synergistic impact of them on each other. Quality management systems should be chosen based on the needs of the organisation. One system is not a perfect fit for any organisation. However, pulling the best of each quality management system may be of better benefit to an organisation. TPM and 5S have always been the least favoured quality activities adopted in Iranian healthcare settings. It is important for managers to use these two techniques as well in order to develop and sustain a quality culture.

Quality management requires the cooperation and collaboration of all those people involved in the delivery of healthcare services. The results have shown that TQM had better effects on performance in organisations using participative management. Nevertheless, the use of suggestion scheme did not lead to good results, though quality circles and autonomous groups had more synergistic effects. It seems that healthcare managers do not use the suggestion system appropriately and systematically. Therefore, employees are not interested in this participative management technique and prefer to do quality efforts together in quality teams. Managers should give employees more autonomy to do their own works.

The findings of this study showed that smaller healthcare organisations tend to implement TQM more successfully than larger ones. There is a debate in the literature about the influence of the size of a firm on TQM implementation. While Ghobadian and Gallear (1996) and Taylor and Wright (2003) did not find operational differences in TQM implementation attributable to firm size, other studies found a significant difference between TQM success and the size of the firm (Eng and Yusof, 2003; Hendricks and Singhal, 2001).

Private Iranian healthcare organisations experienced higher success in their TQM programme than public ones. Despite the potential benefits, several scholars suggest difficulties in adopting the principles of TQM in the public sector. A short-term perspective due to frequent political changeovers, a highly centralised structure, a lack of management autonomy, inter-organisational politics, complex inter and intra-organisational relationships, financial pressures, an emphasis on due process over efficiency, lack of market incentives, external constraints, resistance to change, little incentive to innovate and reduce costs in the public sector and rising demand for public services contribute to the difficulty of adopting and implementing TQM in the public sector (Bowman and Hellein, 1998; Morgan and Murgatroyd, 1994).

TQM must be modified substantially to fit the public sector’s unique characteristics. The public sector will also need to change many of its attitudes,
behaviours and even its culture to be compatible with the principles underpinning the TQM approach. It requires long-term commitment, changes in organisational goals and performance indicators, changes in management roles and practices, and major work and organisational redesign. It requires accountability by professional managers and leaders, an emphasis on results rather than on procedures, explicit standards and performance measures, an emphasis on competition and performance-oriented reward schemes to improve productivity and more enlightened financial management that uses resources efficiently rather than “spending up a given annual budget” (Brysland and Curry, 2001; Scharitzer and Korunka, 2000).

The challenges to adopting TQM in healthcare organisations suggest that managers should take a cautious and an incremental approach in its implementation. Radical transformation of processes has been found to have negative and detrimental effects on many organisations (Singh and Smith, 2006).

Conclusions

The findings indicated that TQM was less successful in Iranian health sector due to lack of a quality management system, low employees participation in quality management activities and inappropriate strategies for managing quality. The research suggests that TQM implementation practices could result in better organisational performance. The findings revealed that the primary constructs of TQM were the strongest predictors of organisational performance. The most important contributing factors to successful TQM implementation in the Iranian health sector were Employee management, Information management, Customer management, Process management and Leadership. Furthermore, using a combination of quality management techniques has “synergistic” effect on TQM success.

TQM demonstrates some potential for successful implementation in Iranian healthcare organisations as far as its principles and practices can be adapted in an ethnocentric manner tailored to the Iranian context and culture. Successful implementation of TQM depends on a number of factors such as, top management commitment and involvement, strategic quality planning, focus on customers (both internal and external), quality awareness training, employee commitment and continuous improvement.

The findings of this study contribute to the quality management and healthcare literature in several ways. First, a valid and reliable instrument was developed and used to assess TQM practices in the Iranian health sector. Second, this research documented the extent to which Iranian healthcare organisations utilised TQM. As noted earlier, there is very little information in the current literature on the extent of quality management implementation in the healthcare organisations of this country. This study contributed to theory about the nature of quality management practices in Iranian healthcare organisations.

From a practical point of view, the findings provide managers and researchers with a practical understanding of the critical success factors of TQM implementation in healthcare organisations. The results will help managers in planning more effective TQM designs. They will be able to re-allocate more resources to those constructs of TQM that have the most significant impact on organisational performance. The findings will provide decision makers with quantifiable benchmarks on TQM implementation in Iranian healthcare organisations. Managers and researchers can employ the survey instrument to evaluate TQM implementation initiatives and identify problem areas requiring improvement.
This study may serve as a foundation for future research in different countries and diverse cultural settings. Researchers will be able to use the findings for developing quality management theory and constructing a suitable model of TQM. The results of such studies can be very helpful for developing a model of TQM that can be implemented successfully in a cross-cultural context.

References


Developing and validating a TQM model


Further reading


Corresponding author

Dr Ali Mohammad Mosadeghrad can be contacted at: mosadeghrad@gmail.com