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Effects of Total Quality Management Practices on Financial and Operational Performance of Hospitals

Songul Zehir [1,*] and Cemal Zehir [2,3]

[1] Social Sciences Institute, Gebze Technical University, Kocaeli 41400, Turkey
[2] Department of Business Administration, Yildiz Technical University, Istanbul 34220, Turkey; czehir@yildiz.edu.tr or cemalzehir@gmail.com
[3] Center for Islamic Finance, Azerbaijan State University of Economics (UNEC), Baku AZ 1001, Azerbaijan
* Correspondence: songulzehir@gmail.com

Abstract: The Total Quality Management (TQM) system is known to have a beneficial impact on sustainability. This study aimed to elucidate the achievement of hospital sustainability by analyzing the relationship between the implementation of TQM practices (leadership of management, decision making, continuous improvement, customer focus, employee involvement, process management, and relations with suppliers), and their impact on the financial and operational performance of hospitals. The gathered data underwent analysis using structural equation modeling (SEM) to empirically investigate the impact of TQM methods on the financial and operational performance of hospitals. A total of 1069 surveys were completed in 6 privately-owned and 26 publicly-owned hospitals located in the Marmara region of Turkey. This study contributes significantly by addressing gaps in the existing literature. There is a lack of empirical research that has examined the potential correlation between TQM, operational success, and financial performance in both public and private hospitals. Especially in developing nations like Turkey, the focus is on the early phases of implementing TQM principles, with a primary emphasis on continuous improvement and sustainable performance. The results demonstrate that Total Quality Management (TQM) exerts a substantial impact on the financial and operational performance of hospitals in the service industry.

Keywords: total quality management; operational and financial performance; hospital; sustainability; structural equation modelling

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1. Introduction

The healthcare industry is prioritizing sustainability, and hospital organizations are increasingly acknowledging the need to incorporate sustainable practices into their operations. Total Quality Management (TQM) emerges as a promising approach in this context.

Over the past three decades, TQM has been widely adopted as a management paradigm. The resource-based view (RBV) of the organization focuses on the firm's resources and capabilities to establish a link between sustainable development (SD) practices and its performance [1]. A study conducted by Li et al. [2] introduces a theoretical framework that elucidates the relationship between TQM and organizational performance.

The implementation of TQM exerts a substantial and favorable influence on the environmental, social, and economic aspects of firm sustainability. Effectively using TQM methodologies results in a significant improvement in sustainable development [1,2]. TQM's emphasis on continuous improvement leads to cost savings through efficient utilization of internal resources. Furthermore, it improves the sustainability of businesses by safeguarding the environment and conserving natural resources. Enhancing the economic viability of the business yields many advantages, such as heightened client contentment, diminished errors, and enhanced operational efficiency—all achieved through the application of TQM [1]. The social dimension of sustainability comprises the ethical undertakings

carried out by organizations to promote the well-being of society [3], such as ensuring high-quality healthcare services, implementing safety measures, and adopting responsible work practices. Researchers [4] have conclusively established a definitive correlation between TQM and the financial sustainability of businesses.

The implementation of TQM entails the prioritization of customer and market requirements, the cultivation of teamwork, the promotion of staff involvement, and the efficient management of processes. All of these variables collectively lead to the establishment of a culture of excellence within the firm. Organizations aim to foster a culture of TQM to ensure their long-term viability and success [5]. Nevertheless, their endeavors to execute TQM frequently stumble due to the lack of a TQM culture [6].

The success of TQM practices is confirmed in the manufacturing industry. Commitment of top management, employee involvement, data-driven performance, understanding of variation, and continuous improvement contribute to ensuring quality as a result of interdependent processes [7]. Despite these positive outcomes, implementation of these practices in the healthcare industry is slow. Lack of standard uniform products in healthcare, lack of an assembly line in healthcare, differences in cultural settings, difficulty in measuring or defining healthcare quality, and belief that higher quality would lead to higher cost are some of the reasons for this hesitation [7].

On the other hand, it is rather difficult to have satisfied customers in hospitals. This is because evaluating the quality of healthcare services might be perceived as more complex and risky. Reasons for these difficulties in evaluating the quality of healthcare services can be ordered as follows: firstly, the intangible nature of healthcare services makes it difficult to determine customer expectations. Secondly, the skills and manners of employees who offer service to customers are evaluated as important criteria [8]. Thirdly, customers may not have the technical expertise to assess the service quality in the hospital. Some participants take into consideration the price of health services to evaluate quality. Some participants consider the level to which his or her health recovers [9]. Another evaluation criterion in the sight of customers is that a good doctor or nurse is expected to be competent, courteous, empathetic, and expected to communicate and relate well to [10]. These service characteristics can be decisive among customers when they are choosing healthcare [11]. As such, the involvement of many participants with different interests makes it difficult to define quality.

Although there are concerns about quality in the healthcare industry, the increased importance of quality in the healthcare industry has led to the occurrence of various methods to ensure quality in hospitals. Quality in the healthcare industry is improved and audited with different methods like accreditation, continuous professional development, clinical audits, and peer reviews [12]. Providing service quality concluded with positive effects on patient satisfaction and productivity. Awareness of organizations regarding these positive outcomes makes quality issues more attractive.

The absence of a universally accepted and scientifically supported definition of sustainability in healthcare complicates the evaluation of this crucial concept. Healthcare systems, like many other industries, are working to address sustainability concerns while continuously elevating their quality standards [13]. Recent research [14] has emphasized the frequent tensions that arise when attempting to strike a balance between the objectives of improving sustainability and delivering high-quality service. Although evaluating the quality of health care services might be perceived as more complex and risky, implementing TQM becomes indispensable for hospitals to have a competitive advantage and satisfied customers. Creating new products/services and delivering them to customers, better and faster than any other competitors, at a lower cost and higher quality are the proofs of competitive advantage. Other factors such as controlling costs, improving productivity, structuring flexible human resources, applying new technologies, and maintaining continuous improvement protect the competitive situation of hospitals [15].

In addition to the role of implementing TQM to have a competitive advantage, competition among hospitals triggers them to represent quality in their services. In the US,

England, and the Netherlands, there has been significant attention paid to the potential for hospital competition to drive increases in quality and efficiency. According to wider economic theory gives a clear response: under a fixed regime, competition will improve quality. Like previous work from Kessler and Geppert [16], Cooper et al. [17] supported that to current efforts in England to increase the amount of publicly available information on quality and promote hospital competition.

There is a limited body of published studies that delve into the relationship between the fundamental notion of TQM and operational sustainability. Notably, while TQM has been extensively explored in the context of institutional performance, its correlation with sustainability in Turkish hospitals has not been sufficiently researched.

The aim of this study is to examine the effects of TQM practices (management leadership, decision making, continuous improvement, customer focus, employee involvement, process management, and supplier relationships) on the financial and operational performance of hospitals. Also, the effect of operational performance on financial performance is investigated. Hospitals are determined as a field to examine because they have different systems than manufacturing industries. They are even different than some of the other service industries like finance and education. Healthcare services consist of interconnected processes and these processes can be separated into distinct processes [7]. In addition, hospitals have a more complex organizational culture dominated by physicians and professional power [18]. Implementation of TQM practices within these processes and complexity may represent different findings.

In line with these objectives, the quality of service and its importance for hospitals were emphasized. Then, TQM practices and performance dimensions were discussed depending on a literature review. Second, a theoretical framework and hypotheses were proposed that enable us to determine the effects of TQM on hospitals. In the research methodology section, basic information related to sampling, data collection, and the measurement instrument was given. The analysis procedure started with exploratory factor analysis to reveal the items related to the variables. After testing the validity and reliability of the variables, confirmatory factor analysis was used to test the fitness of the model. Finally, conclusions and discussions were shared.

2. Materials and Methods

2.1. Review of Scientific Literature, and Hypotheses Development

Forces such as upgrading standards of living and education, competitive pressures, medical advancements, alternative healthcare delivery mechanisms, changing cost structures, monitoring by public and private groups, increased information availability, and better-informed customers make it necessary to reevaluate strategies for hospitals [19]. Additionally, strengthening the positions of the customers and increasing awareness of patient safety put pressure on hospitals to improve efficiency in line with cost-effectiveness and quality of care [18]. While hospitals are attempting to be in a more powerful position, they search for different processes. TQM practices with their positive effects on customer satisfaction and competitive advantage have the potential to respond to their needs.

At the initial stage of applying the industrial model of quality to healthcare, professionals and managers consider that the concept of quality management has been beneficial for the manufacturing industry. They believed that it may not be beneficial for the hospital context. In particular, "zero defects" and "statistical process control" techniques have been given as reasons for the difficulties of use. The applicability of quality management in hospitals is encouraged in different studies by emphasizing different alternatives to implement and evaluate quality. Tomes and Peng [10] stated that patient satisfaction in addition to medical care and technical aspects should be added to define, implement, and evaluate quality. Rodger, Pendharkar and Paper [20] indicated measurements should include appropriateness, continuity, effectiveness, efficacy, efficiency, timeliness, availability, respect and caring, and safety. Nilsson, Johnson and Gustafsson [21] advocated that many services are individually intensive and they should be adaptable to very distinct needs.

Hospitals should be aware of the definition of service quality first. Service quality is defined as the difference between customer expectations and customer perceptions [8,22,23]. Historically, the quality of a hospital is defined in terms of the technical delivery of its care. Recently, however, patients' perceptions and expectations play an important role in the quality of hospitals [24,25]. Service quality of hospitals has been distinguished into two categories [23]: technical quality and functional quality. Technical quality relates to the clinical and operating skills of doctors, nurses' familiarity with drugs, and laboratory technicians' expertise. Functional quality is evaluated through which medical care is delivered such as the communication skills of the staff, the facilities, cleanliness, and the quality of food [8,11,23].

The indispensability of implementing TQM is studied in the literature by emphasizing its benefits. Douglas and Judge [26] confirmed that the greater the degree of TQM practices, the greater the probability of improving organizational performance. To measure and improve quality, some TQM practices are included in the literature. The decision regarding which management practices should be included for effective TQM implementation is a field of study. Wardhani et al. [18] examined 533 publications. Organizational culture, design, leadership for quality, physician involvement, quality structure, and technical competence are indicated as supportive factors of TQM implementation in hospitals [18]. Sureshchander et al. [27] defined critical quality practices for service organizations as top management commitment, human resource management, technical system, information and analysis system, benchmarking, continuous improvement, customer focus, employee satisfaction, union intervention, social responsibility, service scapes, and service culture. Yang [28] mentioned similar content that includes customer focus, continuous improvement, employee participation, teamwork, process focus, systemization, empowerment, and leadership.

The successful implementation of the organizational factors determines the sustainability of TQM [29]. Upon doing a comprehensive analysis of the literature, the TQM practices included in our study are management leadership, employee involvement, decision making, supplier relationships, process management, customer focus, and continuous improvement based on the ISO 9001:2000 quality assurance system. Although not exhaustive, these factor areas have often been considered the critical factors of TQM [30]. Also, these practices have a "synergistic" effect for successful TQM implementation [12] (p. 544).

The research model firstly indicates these critical practices to conduct TQM successfully. And then, the effects of these practices on operational performance and financial performance are investigated separately. Lastly, the relationship between operational performance and financial performance is interrogated. Prior to explaining hypotheses about these relationships, each of the TQM practices and their outcomes are explained under this title.

2.2. Management Leadership

Management leadership has an important role in the implementation of TQM as stated by quality gurus [31,32]. Effective leadership is essential in establishing the foundation of TQM [6]. Puffer and McCarthy [33] provided a framework for evaluating leadership in a TQM context and claimed that creating a vision and promoting change is an essential talent for top management to implement TQM successfully. For quality management, managers should put aside their traditional administrative status and become leaders who define goals and direct the quality initiative on the right path [34].

Implementing TQM practices as a strategy increases the role of leaders in executing these TQM strategies. Because leadership is related to quality planning, human resource management, learning, and customer focus [35]. If managers want to manage these practices effectively, leadership is the primary key [36]. Leaders may influence the behavior of people to adopt new practices necessary for TQM. Motivated and persuaded employees by leaders are considerable in the service industry as in hospitals. Service is executed by employees. Motivated and persuaded employees in hospitals with leadership skills of man-

agers contribute to operational and financial performance. As stated by Mosadeghrad [12] leadership positively influences implementation of TQM practices successfully. Top management leadership is responsible for achieving sustainable goals [5].

2.3. Decision Making

Decision making is one of the major responsibilities of management and requires selecting from alternatives. Decision makers choose alternatives to realize organizational goals and strategic objectives and adapt to the external environment. Service intangibility, however, makes it difficult to make decisions on how consumers perceive services and service quality. When a service provider knows how the consumer will evaluate the service, they will be able to suggest how to influence these evaluations in the desired direction [8]. Lee et al. [37] stated that the most important contributing factor to quality improvement in Korean hospitals is the use of scientific decision-making procedures.

In TQM, the decision-making process does not belong simply to managers, but employees also play a role in this process. Participating in decision making can speed up the process, and this speed can affect different performance criteria in a positive way [38]. Operational and financial performance are some of them. Organizations face many managerial and adoption problems through TQM implementations. They should define their priorities to allocate their resources. Good decision making facilitates solving problems, allocating resources, and accomplishing goals [36]. Hospitals that race against time for the health of people give importance to solving problems and choosing the best. If they have well-structured decision-making processes, these processes contribute to executing different TQM practices within the organization.

2.4. Process Management

As Ittner and Larcker [39] (p. 523) explained, "A process is a set of activities that, taken together, produce a result of value to a customer". A process thus leads to actions as a structure. And, this structure should produce value that improves efficiency and thus result in satisfied customers [21,40]. Process management is very important for the quality management system because building processes means that leaders, individuals, and teams day by day try to practice the needed values and competencies based on the principle of continuous improvement and the company's mission, vision, goals, and strategies [41].

The service process in the hospital context differs from manufacturing. However, this is because it includes complex and high-level interactive procedures, which are supervised by the customer. Employees, customers, and managers are part of this process. Thus, process orientations have a significant and direct impact on customers' satisfaction with services [21,42]. Well-managed processes may conclude with high operational quality performance [43]. Sustainability of the operational and quality performance also intensively depends on process management because process management provides structure to represent the same quality service at any time.

2.5. Continuous Improvement

Quality assessment is a process that requires consideration and continuous attention [24]. Therefore, continuous improvement is one of the significant elements of quality management. It is defined by Daft [36] (p. 49) as "the implementation of small incremental improvements in all areas of the organization on an ongoing basis". Continuous improvement means never-ending attention to detail, which reduces the effort and time that it takes to conduct operations [40]. As a result of its emphasis on continuous improvement, TQM contributes to sustainability by encouraging the adoption of environmentally favorable practices that reduce resource consumption [44]. Continuous improvement is a core tenet of TQM and plays a crucial role in ensuring the long-term viability of hospital management. Hospitals possess the capacity to establish performance measurement systems, set sustainability objectives, and maintain ongoing monitoring of their progress. Hospitals can

utilize data collection and analysis to identify areas in need of improvement, implement corrective measures, and verify the efficacy of sustainability programs.

Organizations must update their quality processes based on technical and administrative activities. Hospitals that aim to have long-term success in the healthcare sector, should adopt the main philosophy of continuous improvement. Improving things a little bit at a time, all the time contributes to high-performance success [36]. The undeniable importance of continuous improvement programs appeared in the better performance results [15]. Since TQM focuses on continuous improvement and efficient use of resources, it provides an excellent orientation for the development of institutional sustainability [45].

2.6. Employee Involvement

The implementation of the Total Quality Management (TQM) model is endorsed by all levels of employees within an organization. At the executive level, managers have a crucial responsibility in establishing the vision and objectives for the TQM implementation. TQM evaluation can be conducted by establishing explicit quality objectives, allocating resources, and fostering a culture of ongoing enhancement across the entire organization. Additionally, at the executive level, managers are accountable for executing Total Quality Management (TQM) plans and ensuring adherence to quality standards. The evaluation of Total Quality Management (TQM) can be accomplished by the monitoring of key performance indicators, conducting periodic audits, and offering training and assistance to personnel. Front-line employees refer to individuals directly involved in the production or delivery of goods and services. An effective way to evaluate Total Quality Management (TQM) is through active participation in quality improvement initiatives, offering input on processes, and identifying opportunities for enhancement. Organizations can foster a culture of quality and continuous improvement by engaging employees at all levels in the assessment of Total Quality Management (TQM).

Through the continuous improvement process, employees' acceptance of responsibility is another requirement [46,47]. Widening boundaries of authority for employees contributes to their acceptance of responsibility [47]. At that point, top management's attempt to attract employees' attention to the philosophy of quality management is essential [48]. Successful sustainability efforts require employee participation. Hospitals can train personnel on sustainable practices and empower them to contribute to sustainability goals. Hospitals can promote sustainability and ownership by promoting environmental responsibility and staff participation in decision making.

Involving the employees through the TQM implementation process is an indispensable necessity for organizations [49]. As emphasized in the cited studies, healthcare management should begin to improve service quality by involving and adapting their employees in any quality programs and strategies [9,10,42,46]. They have an important role in quality management success in the service industry [12,50]. The management literature discusses that the behavioral traits of employees can play an important role in the success of TQM. However, little empirical research exists in this regard [51]. Lack of teamwork can hinder the implementation of TQM while aiming to achieve sustainability in organizations [6]. Failure of employees' involvement in quality practices may result in the failure of all TQM practices. Especially in the service industries, managing employees requires more care. Employees are the face of organizations that encounter the customer directly. If they do not feel that their organization gives value to their suggestions, knowledge, and experiences, their intention to represent their full potential to implement TQM practices will decrease.

2.7. Relations with Suppliers

Producing quality products depends on the timely delivery of quality materials and suppliers who are devoted to quality and continuous improvement. From the supplier's point of view, it is essential to meet the buyer's specifications and standards for quality [52–54].

Kannan and Tan [55] indicated that managing the supply chain effectively can drive the decline in lead times and material costs and increase improvements in product quality

and responsiveness. Krause, Handfield and Scannell [56] posited that to have a source of competitive advantage, suppliers' performance must be managed and adapted to meet the buying firms' needs. Close relationships with suppliers must be facilitated to fulfill this process. This also increases the possibility that the provider and the supplier are working toward the same goal based on the principles of Total Quality Management. Effective supplier management enhances the quality of purchased products, reduces the cost [12], and positively influences process management [57]. A hospital may use hundreds of suppliers to conduct the service. Cooperative relationships with suppliers lead to lower costs, higher quality, and faster service in the healthcare industry. The benefits of close relationships with suppliers can be seen in the operational and financial performance of hospitals.

2.8. Customer Focus

To run a business more efficiently, organizations should include customers in all improvement processes. This provides added value and enhances long-term customer relationships [58]. Zineldin [58] demonstrated that a company must create a triangular relationship among quality, customer relationship management, and customer loyalty for a better position in a competitive marketplace.

Patients who acquire services from the hospital are customers. Wu and Chan [59] defended that perceived service quality by the customer has a major impact on the purchase decisions and sustainability of business operations. Factors such as minimal waiting time, flexible operating hours, staff availability, and cost-effective treatment, however, do not automatically lead to satisfied patients. Dimensions of patient satisfaction also include reliability, responsiveness, assurance, empathy, and other tangibles that contribute to improving the quality of service [60].

Evaluating the quality of service and obtaining feedback from customers, however, are difficult in hospitals. The lack of mechanisms for measuring satisfaction and low levels of information from customers about healthcare services create a performance evaluation problem [46]. Defining the necessities and expectations of customers, measuring their satisfaction, and obtaining their feedback lead organizations to improve the quality of services [12]. TQM simultaneously increases customer and employee satisfaction and generates a competitive advantage [61]. An effective customer database, for example, helps hospitals understand customer needs and demands and also differentiates them from competitors. When hospitals develop solutions to find out what customers want and need, customer-focused orientation may result in better financial performance.

2.9. Operational Performance

Operational performance is a concept that defines how well a production unit uses its resources when converting them into output. To compare the relative operational performance of product units may involve activities that have implications for consuming and generating resources. Organizations have operational goals in addition to their strategic goals like deliveries on time, fewer mistakes, and less waiting time [36]. TQM practices enable us to reach operational goals and increase operational performance. As researchers [43] (p. 1835–1837) explained: "the categories of leadership, customer focus and management of people were the strongest significant predictors of operational performance".

This study supposes that TQM practices affect operational performance positively. Leadership, decision making, process management, continuous improvement, employee involvement, supplier relations, and customer focus create potential for a well production unit based on organizational resources. This is because TQM practices create value, time-based competition, quality, and low prices, all of which are required for competition. Factors such as fewer mistakes, fewer delays, and less rework, increase productivity. Preventing the cost of fatal mistakes will also create a competitive advantage, especially in hospitals [57,62]. With these assumptions, the following hypothesis is proposed:

H1. *There is a positive relationship between "TQM practices" (management leadership, decision making, process management, continuous improvement, employee involvement, relations with suppliers, customer focus) and "operational performance" in hospitals of the service industry.*

2.10. Financial Performance

The effectiveness of Total Quality Management (TQM) is influenced by various factors, and organizations have adopted it from different perspectives to improve their operational and financial performance [1]. Organizations define goals to accomplish their mission and create optimal value. One of these goals is related to financial performance. High revenues in existing and new markets, high productivity, and efficiency are indicators of financial performance [36]. TQM serves as a potent source of strength for organizations aiming to attain higher productivity, profitability, and sustainable business performance [5].

TQM practices have the potential to increase financial performance. Customer satisfaction has been shown to lead to positive financial performance [46,63,64]. Satisfied customers will contribute to profitability through increased spending and word-of-mouth communication [22]. Likewise, customer dissatisfaction leads to consumer complaints and negative word of mouth. These behaviors reduce business volume within the organization [22].

On the other hand, operationally well-worked hospitals contribute to customer satisfaction with fewer mistakes, less waiting time, and less rework. Improvements in the operational performance of hospitals show its benefit on customer satisfaction. To be a preferred hospital by customers creates improvement in financial performance.

Organizations use many ways to achieve sustainable performance, including TQM [65]. In line with the aim of this study, TQM principles such as low costs, high quality, speedy service, and customer satisfaction, however, absolutely influence financial performance. In this context, The following hypotheses were proposed:

H2. *There is a positive relationship between "TQM practices" (management leadership, decision making, process management, continuous improvement, employee involvement, relations with suppliers, customer focus) and "financial performance" in hospitals of the service industry.*

H3. *There is a positive relationship between "operational performance" and "financial performance" in the hospitals of the service industry.*

3. Research Methodology

This section provides an overview of the research model, measurement instruments, sampling process, collecting data, and analysis.

3.1. The Nature of the Research

The research model of this study examines the effects of TQM practices (management leadership, decision making, process management, continuous improvement, employee involvement, supplier relations, and customer focus) on the operational performance and financial performance of hospitals as illustrated in (Figure 1).

Based on the research model, hospitals that implement TQM practices will have a chance to increase their financial performance in accordance with their operational performance.

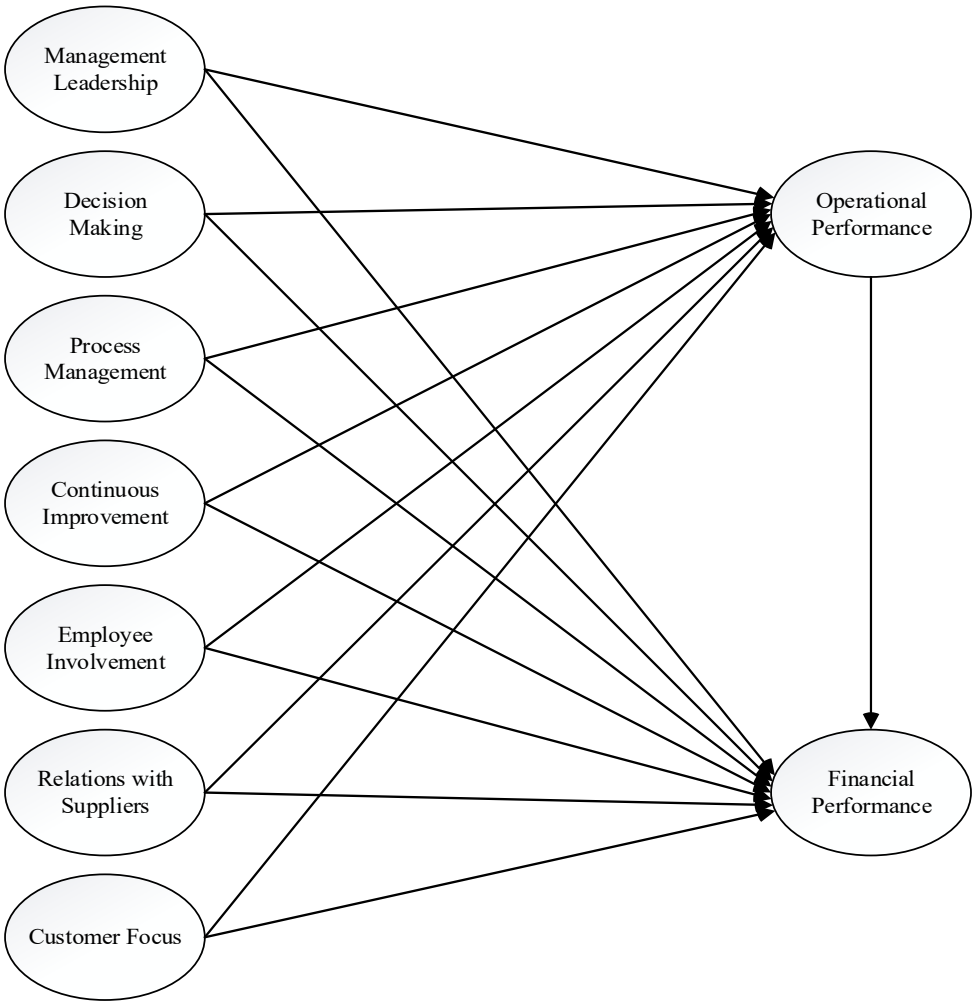


Figure 1. Research model.

3.2. Measurement Instrument for TQM Practices

Although many studies have examined Total Quality Management, we found that no measurement instrument has validity and reliability of all components of TQM that we describe here. To fill this gap, we did not use a measurement instrument from any single study, and instead preferred to create a unique one.

To construct the measurement instrument, we applied the methodology to develop measurement scales in social sciences [66]. In general, the procedure that allows one to move from the concept to its measurement requires a four-stage process: (1) literary definition of the concept, (2) specification of dimensions, (3) selection of observed indicators, and (4) synthesis of indicators or elaboration of indexes.

TQM practices that were determined as management leadership, decision making, process management, continuous improvement, employee involvement, supplier relations, and customer focus were derived from the quality management principles based on the ISO 9001:2000 quality assurance system.

To measure these TQM practices, items were generated based on the literature and interviews with people from the healthcare industry. In determining questionnaire items from the literature, some questions were not applicable to implementing TQM for hospitals, as they were used in research for the industrial context. Therefore, a group consisting of doctors, nurses, and administrative employees of hospitals brainstormed ways in which the questions could be integrated into the hospital context. Their experiences and notions contributed to the process of preparing the questionnaire.

Management leadership factor items were customized from the studies of Cua, McKone and Schroeder [67]; decision-making factor items were adapted from Cua et al. [67], Fuentes-Fuentes et al. [68], Saraph, Benson and Schroeder [69]; process management factor items were taken from the studies of Cua et al. [67], Kaynak [57]; continuous improvement factor items were drawn from the studies of Kaynak [57], Rahman and Bullock [70], Fuentes-Fuentes et al. [68]; employee involvement factor items were adapted from the studies of Cua et al. [67], Rahman and Bullock [70], Fuentes-Fuentes et al. [68]; supplier relations factor items were drawn from the studies of Kannan and Tan [55], Rahman and Bullock [70] and customer focus factor items were adapted from the studies of Rahman and Bullock [70], Fuentes-Fuentes et al. [68], Chong and Rundus [71].

Effects of TQM practices on performance were evaluated in two dimensions: operational performance and financial performance. Operational performance factor items were adapted from the studies of Kaynak [57] and Fuentes-Fuentes et al. [68], whereas financial performance factor items were taken from the studies of Fuentes-Fuentes et al. [68]. Fifty items were assessed using a 5-point Likert scale (Appendix A). Respondents indicated their disagreement (1 = strongly disagree) or agreement (5 = strongly agree) on TQM practices of operational and financial performance of hospitals.

3.3. Sample Demographics

The data of the study were collected by the questionnaire prepared in the light of published studies and the suggestions of medical and administrative staff. Medical and administrative staff were chosen as target participants that reflect the perspectives of hospitals. The cross-sectional survey methodology was implemented in 32 hospitals. To increase the response rate, the confidentiality of the responses was guaranteed. A total of 1069 questionnaires were correctly completed and collected from 26 public and 6 private hospitals.

Among these, 69.1% (739) of the employees were from public hospitals, and 30.9% (330) of the employees were from private hospitals. The size of these hospitals ranged from 50–2300 employees. Approximately 71.6% (765) of the respondents were positioned in hospitals that employed 200–1100 employees. These hospitals served in both regional (35.5%) and national (63.3%) areas.

4. Results

Statistical Analysis

For analysis, we used the statistic software program AMOS 5.0. First, all of the 50 items were included in the analysis to form a scale of TQM practices, financial, performance, and operational performance. We referred to Cronbach's alpha to ensure the reliability of variables. As a result of the analysis, the Cronbach's alpha value was high at 0.925. Second, we looked at the corrected inter-item correlation. It was found that the resulting values were 0.500 and above, except for one item (0.418), CF5 ("Managers and supervisors encourage patient satisfaction development activities"). According to these findings, variable CF5 was removed from the scale.

The specified structural validity of TQM practices, financial performance, and operational performance instruments consisted of 49 items in nine basic components as a result of the principal component analysis. In the data reduction procedure, items having eigenvalues greater than 1 were used to determine the number of factors in the data set. Principal component analysis was applied with promax rotation to identify key TQM practices, financial performance, and operational performance factors. Factor loadings of these variables that we took into account were 0.500 and above (0.630–0.964). According to the principal component analysis, the Kaiser–Meyer–Olkin measurement of sampling adequacy is 0.964.

To assess the validity and reliability of the scale developed for this study, the following analyses suggested by Bagozzi and Philips [72] were used: content validity, unidimensionality, reliability, convergent validity, discriminant validity, and predictive validity.

Confirmatory factor analysis (CFA) was used to test model fitness (Table 1). CFA is the most well-known statistical procedure used to test the structures with factorial components generated by establishing hypotheses. Model fitness was evaluated based on multiple fit indexes. In the framework of the CFA procedure, the chi-square statistic is the most popular index to evaluate the goodness of fit between the specified and actual models. Wheaton et al. [73] suggested that the researcher also compute a relative chi-square (χ^2/df). They suggested a ratio of approximately five or less as reasonable. This ratio indicates that the null model and data are appropriate with one another [74]. In our experience, however, the ratio of chi-square (χ^2) to degrees of freedom (df) fell in the range of 2 to 1 or 3 to 1, indicating an acceptable fit between the hypothetical model and the sample data [75].

Table 1. Model purification process.

Factor Name	Reason for Elimination	CMIN/df	GFI	AGFI	NFI	IFI	TLI	CFI	RMSEA
CF5	Eliminated in EFA	3937	0.848	0.829	0.888	0.914	0.907	0.914	0.052
PM6	SR	3800	0.859	0.841	0.894	0.920	0.913	0.914	0.051
PM7	SR	3743	0.863	0.845	0.898	0.923	0.916	0.923	0.051
RS1	SR	3738	0.865	0.847	0.900	0.925	0.918	0.925	0.051
OQP1	MI; SR	3503	0.877	0.861	0.908	0.932	0.926	0.932	0.048
OQP7	MI; SR	3374	0.884	0.867	0.912	0.936	0.930	0.936	0.047
EI1	MI; SR	3298	0.889	0.873	0.915	0.939	0.933	0.939	0.046
DM1	MI; SR	3230	0.895	0.879	0.919	0.943	0.937	0.943	0.046
OQP2	MI; SR	3072	0.902	0.886	0.924	0.948	0.942	0.948	0.044
L1	MI; SR	2979	0.907	0.891	0.929	0.952	0.946	0.951	0.043
DM2	MI	2975	0.910	0.894	0.931	0.953	0.948	0.953	0.043
OQP9	SR	2950	0.913	0.897	0.934	0.955	0.950	0.955	0.043
CF 1	MI; SR	2886	0.918	0.937	0.957	0.958	0.952	0.958	0.042

(SR = Standard Residual Covariances; MI = Modification Index).

Because of the sensitivity of the chi-square test to the sample size, however, insufficient sample size makes it difficult to find existing differences between the groups and deviations from multiple variables normality. We therefore used multiple fit indexes to reduce measurement errors.

The goodness of fit indexes (GFI) were used to determine the model fit when measuring the fitness of the entire model. The GFI indicates the relative quantity of variance and covariance described in common. The adjusted goodness of fit index (AGFI) differs from GFI. AGFI adjusts to the number of degrees of freedom (df) in the model. AGFI and GFI values measured between 0.80 and 0.89, indicating a moderate fit, whereas values measured above 0.90 indicated a good fit [76].

The comparative fit index (CFI) indicates the fitness of the tested model and assumed model with one another [77]. The normal fit index (NFI) and incremental fit index (IFI) evaluate the degree of freedom of the evaluated model relative to the initial model [77]. An IFI value close to 1 indicates a very good fit [77]. The typical range for TLI lies between 0 and 1, but is not limited to that range. A TLI value close to 1 indicates a very good fit.

The following findings were obtained as a result of the fitness analysis of the initial and last model as a result of principal component analysis as displayed in (Table 2).

Table 2. The results of the confirmatory factor analysis.

		Std.Regression Weights	S.E.	C.R.	*p*	Cronbach's Alpha	Composite Reliability	A.V.E
Leadership						0.873	0.875	0.585
	L2	0.679						
	L3	0.778	0.057	22.685	***			
	L4	0.838	0.056	24.137	***			
	L5	0.834	0.051	24.047	***			
	L6	0.682	0.051	20.184	***			
Decision Making						0.807	0.810	0.586
	DM3	0.804	0.052	23.040	***			
	DM4	0.782	0.052	22.568	***			
	DM5	0.709						
Continuous Improvement						0.873	0.878	0.644
	CI1	0.698						
	CI2	0.845	0.044	25.115	***			
	CI3	0.832	0.043	24.785	***			
	CI4	0.827	0.045	24.665	***			
Customer Focus						0.876	0.877	0.587
	CF2	0.752						
	CF3	0.784	0.044	25.473	***			
	CF4	0.76	0.043	24.633	***			
	CF6	0.808	0.045	26.281	***			
	CF7	0.727	0.044	23.474	***			
Employee Involvement						0.917	0.918	0.738
	EI2	0.865	0.035	31.746	***			
	EI3	0.881	0.034	32.508	***			
	EI4	0.901	0.033	33.466	***			
	EI5	0.786						
Process Management						0.847	0.871	0.580
	PM1	0.781	0.060	17.285	***			
	PM2	0.818	0.063	17.681	***			
	PM3	0.801	0.060	17.507	***			
	PM4	0.837	0.062	17.865	***			
	PM5	0.532						
Relations with Suppliers						0.923	0.925	0.756
	RS2	0.809	0.029	35.181	***			
	RS3	0.904	0.024	43.952	***			
	RS4	0.894						
	RS5	0.869	0.024	40.475	***			
Financial Performance						0.893	0.895	0.810
	FP1	0.856						
	FP2	0.943	0.040	26.947	***			
Operational Quality Performance						0.879	0.879	
	OQP3	0.757	0.036	26.481	***			
	OQP4	0.745	0.036	25.932	***			
	OQP5	0.762	0.035	26.695	***			
	OQP6	0.779	0.036	27.434	***			
	OQP8	0.806						

S.E.: standard error of regression weight; C.R.: critical ratio for regression weight; A.V.E.: average variance extracted ***: $p < 0.001$.

To assess the reliability, Cronbach's alpha coefficient and composite reliability scores were calculated (Table 2). According to critical levels indicated by Fornell and Larcker [78], scales showed acceptable levels of reliability because Cronbach's alpha coefficient and composite reliability scores were greater than 0.70. Factor loadings shown in (Table 2) are large and all significant ($p < 0.01$) providing evidence for convergent validity.

The validity of the measurement model was also assessed using two important criteria: discriminant validity and convergent validity. Convergent validity gauges how closely the individual indicators of a construct are interrelated in explaining their variances. To evaluate convergent validity, the average explained variance (AVE) for all the items associated with each construct was used. According to established standards, an acceptable AVE value should be exceeded by 0.50. We found that all the variables in our study surpassed this 0.50 threshold for AVE. For instance, the lowest AVE value was obtained as 0.580, well exceeding the 0.50 threshold. This indicates that our measurement model effectively demonstrated convergent validity, as the indicators of each construct adequately explained their variances and displayed appropriate relationships with one another (Table 3).

Table 3. Descriptive statistics and intercorrelations of all variables validity and reliability values of variables.

	Mean	SD	CR	AVE	AVE Square Root	1	2	3	4	5	6	7	Financial Performance	Operational-Quality
Leadership (1)	3.68	0.784	0.875	0.585	0.765	(0.765)								
Decision Making (2)	3.77	0.739	0.810	0.586	0.766	0.761 **	(0.766)							
Continuous Improvement (3)	3.82	0.802	0.878	0.644	0.802	0.583 **	0.558 **	(0.802)						
Customer Focus (4)	3.94	0.721	0.877	0.587	0.766	0.545 **	0.482 **	0.616 **	(0.766)					
Employee Involvement (5)	3.20	0.969	0.918	0.738	0.859	0.619 **	0.570 **	0.584 **	0.530 **	(0.859)				
Process Management (6)	3.71	0.781	0.871	0.580	0.762	0.563 **	0.627 **	0.672 **	0.496 **	0.526 **	(0.762)			
Relations with Suppliers (7)	3.46	0.902	0.925	0.756	0.869	0.527 **	0.523 **	0.509 **	0.550 **	0.644 **	0.548 **	(0.869)		
Financial Performance	3.64	0.952	0.895	0.810	0.900	0.434 **	0.394 **	0.431 **	0.512 **	0.401 **	0.405 **	0.411 **	(0.900)	
Operational Quality	3.75	0.719	0.879	0.593	0.770	0.571 **	0.536 **	0.549 **	0.651 **	0.530 **	0.493 **	0.576 **	0.531 **	(0.770)

** Correlation is significant at the 0.01 level (2-tailed). ( ) AVE Square Root.

Discriminant validity, on the other hand, is used to empirically indicate how distinct a construct is from other constructs within a structural model [79]. To confirm discriminant validity, the cross-loadings of indicators are examined [80]. In this method, it is essential that the square roots of the AVE (average variance extracted) values exceed the cross-loadings on other constructs [80]. As seen in Table 3, the square roots of the AVE values for each variable are consistently larger than their correlations with other variables. Additionally, VIF (variance inflation factor) values are used to calculate the multicollinearity of the latent indicators. VIF values exceeding 5 would suggest a high level of multicollinearity among the indicators of the latent construct [81]. In Table 4, all VIF values are less than 5, signifying the absence of multicollinearity in the research model.

Table 4. Variance impact factors (VIF) for variables.

Dependent Variable	Independent Variables	VIF
Financial Performance	Leadership	3.081
	Decision Making	4.223
	Continuous Improvement	4.071
	Customer Focus	2.243
	Employee Involvement	2.588
	Process Management	2.881
	Relations with Suppliers	2.314
Operational Performance	Leadership	3.081
	Decision Making	4.223
	Continuous Improvement	4.071
	Customer Focus	2.243
	Employee Involvement	2.588
	Process Management	2.881
	Relations with Suppliers	2.314

The shared variance between pairs of latent factors in the structural measurement model was compared with AVE scores that were calculated for each component of pairs to evaluate the discriminant validity [78]. The average variance extracted was found to be greater, signaling the discriminant validity.

Inter-correlations among variables are represented in (Table 3) with means and standard deviations (SD). The highest mean is 3.94, which reflects customer focus; the lowest mean is 3.20, which reflects employee involvement. The standard deviations of all variables are higher than 0.70. Pearson correlations are indicated in Table 3. Notably, Cronbach's alpha values are higher than Pearson correlation coefficients for all variables. This is important for construct validity, which evaluates how each item is measured on the scale. Thus, the instrument has convergent and discriminates validities, satisfying construct validity [57]. On the other hand, we also consider that the instrument has content validity too.

We tried to find the best-fitting model based on structural equation modeling. Relationships among the variables are represented in (Figure 2). Among the seven TQM practices, management leadership, decision making, continuous improvement, customer focus, and supplier relations were significantly related to operational performance. On the other hand, only customer focus and process management were significantly related to financial performance.

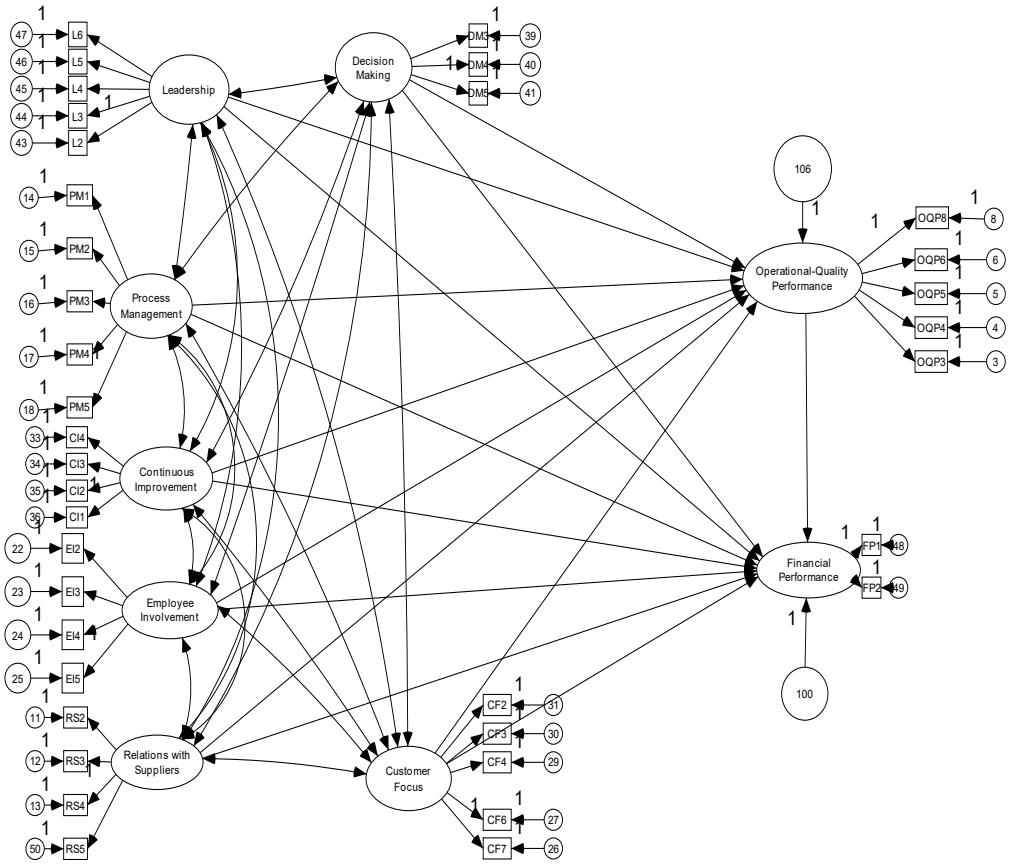


Figure 2. Structural model.

5. Discussion

Total Quality Management practices and dimensions of performance are significantly and positively related to one another. Correlation coefficients are significant at the 0.01 level. The lowest significant coefficient (0.394) is between financial performance and decision making. The highest significant and positive coefficient (0.761) is between leadership and decision making. Based on financial performance, customer focus has the highest correlation coefficient (0.512) among the TQM practices. Also, the correlation coefficient (0.651) between customer focus and operational performance is higher than the others. Other empirical findings support a significant and positive relationship between performance and customer focus [53,67,68,71,82].

Regression weights show that variance of operational performance (H_1) is explained significantly by customer focus (35.7%); supplier relations (20.1%); leadership (13.4%); decision making (9.5%); and continuous improvement (7.7%). Process management and employee involvement do not explain the variance in operational performance. On the other hand, the variance of financial performance (H_2) is explained significantly only by customer focus (21.3%) and process management (8%). In this position, other TQM practices do not explain the variance of financial performance. The influence of operational performance (H_3) on the variance of financial performance is 26.6%. Thus, acceptance of H_3 is supported (Table 5). Overall, TQM practices explained the 53.4% variance in operational performance and 34.3% variance in financial performance.

Customer focus affects both operational performance and financial performance of hospitals more than other TQM practices. If hospitals successfully satisfy their customers, their performance [9,60,63,83–86]. Patients' appraisals of quality are important, and hospitals should monitor patients' perceptions and expectations regularly. In addition to heterogeneity, inseparability, and intangibility features of services, patients' participation in the process requires customer focus to result in better performance. Satisfied patients rec-

ommend hospital services, and their positive word of mouth impacts hospital performance. On the other hand, patient complaints force hospitals to address their service standards.

Table 5. Results of hypothesis testing.

Hypothesized Link.			Estimate	Standardized Estimate	SE	CR	*p*
Leadership	→	Operational Quality Performance	0.151	0.134	0.058	2601	0.009 ***
Decision Making	→	Operational Quality Performance	0.111	0.095	0.063	1755	0.079 *
Continuous Improvement	→	Operational Quality Performance	0.076	0.077	0.045	1711	0.087 *
Customer Focus	→	Operational Quality Performance	0.387	0.357	0.044	8792	0.000 ***
Employee Involvement	→	Operational Quality Performance	0.021	0.026	0.033	0.639	0.523
Process Management	→	Operational Quality Performance	0.006	0.006	0.044	0.136	0.892
Relations with Suppliers	→	Operational Quality Performance	0.163	0.201	0.031	5214	0.000 ***
Leadership	→	Financial Performance	0.108	0.078	0.079	1357	0.175
Decision Making	→	Financial Performance	-0.008	-0.005	0.087	−0.090	0.929
Continuous Improvement	→	Financial Performance	0.035	0.029	0.061	0.580	0.562
Customer Focus	→	Financial Performance	0.285	0.213	0.063	4513	0.000 ***
Employee Involvement	→	Financial Performance	0.025	0.025	0.045	0.556	0.578
Process Management	→	Financial Performance	0.102	0.080	0.061	1669	0.095 *
Relations with Suppliers	→	Financial Performance	0.028	0.028	0.043	0.657	0.511
Operational Quality Performance	→	Financial Performance	0.330	0.266	0.058	5728	0.000 ***

* $p < 0.10$, *** $p < 0.001$.

Relations with suppliers are important to explain better operational performance [53,54,87]. Hospitals should thus have closer relationships with their suppliers to fulfill quality requirements. Effective communication between suppliers and hospitals helps both parties understand what they want from each other in relation to producing services to deliver to patients. Furthermore, hospitals' requirements for service quality lead to improved processes among suppliers. If any kind of problem occurs between suppliers and hospitals, it affects operational performance.

Results of this study also suggest that continuous improvement is significantly and positively related to operational performance. There are examples in the literature that confirm a positive relationship between continuous improvement and performance [12,15].

The TQM application focuses on the quality improvement efforts of employees to not only meet customer expectations but also to drive continuous improvement. Within the framework of TQM, continuous improvement is a pivotal element, highlighting the crucial role that employee engagement plays in the implementation of General Quality Management [88]. Therefore, it is argued that the responsibility for quality efforts lies with both the highest level of employees and the entire workforce [5]. Senior management involvement and leadership in the context of TQM positively impact the organization's overall performance by offering employees training and encouragement to achieve their goals. Employee involvement necessitates effective leadership. Collaboration stands as a critical component of TQM, and its importance is evident in the successful implementation of TQM, which, in turn, ensures the long-term sustainability of organizations [5,6]. The success of development programs is positively influenced by teamwork, the involvement of top management, and effective leadership. These characteristics are essential for the effective implementation of the Total Quality Management program and are regarded as crucial soft success factors. Active participation of individuals is the sole means to implement Total Quality Management (TQM) in any organization [5]. TQM is also seen

as a means of harnessing the full potential of employees and managers while performing their duties and managing an organization.

TQM represents a management methodology that entails the continuous improvement of healthcare quality. In order to enhance healthcare quality, the organization should prioritize the prevention of medical errors and administrative issues, as well as the enhancement of patient and staff satisfaction. Furthermore, a key component of this approach involves the continuous improvement of work processes and the overall work environment [89]. Total Quality Management (TQM) serves as a catalyst to guarantee the provision of high-quality healthcare services. This is achieved via the dedication and expertise of many professionals, including nurses, medical technicians, physicians, chemists, medical staff, and administrators, within healthcare organizations [90]. According to Lee and Lee [89], the active involvement of all members of an organization is essential in achieving Total Quality Management (TQM) and enhancing procedures.

In our results, employee involvement has no significant influence on performance. However, upon examining the correlation relationship, it was found to be associated with both operational and financial performance. In the literature, however, there are positive relations between employee involvement and performance of hospitals [12,46,91]. The reason for our finding can be related to the involvement of employees in medical organizational processes may require them to be more educated and experienced. If organizations lack education and training, positive relationships may not occur [12].

6. Conclusions

The fundamental practices of Total Quality Management (TQM) serve as a foundation for cultivating a quality culture within organizations. These practices include a strong emphasis on customer focus, effective leadership, active involvement of people, a process-oriented approach, a system-wide perspective, continual improvement, a data-driven approach to decision making, and fostering mutually beneficial relationships with suppliers [92]. The adoption of the TQM culture within institutions is encouraged for the sake of sustaining business operations. Hospital organizations can significantly improve their entire performance and produce long-lasting results by implementing TQM principles. TQM offers a structured approach to identifying and resolving areas in need of improvement, encouraging teamwork, and cultivating a culture centered around excellence and long-term viability.

Incorporating TQM ideas into hospital management can greatly improve sustainability outcomes. Hospitals may minimize their environmental footprint, enhance resource efficiency, and contribute to a healthier and more sustainable future by prioritizing energy efficiency, waste management, water conservation, sustainable procurement, staff participation, and continuous improvement. Adopting TQM as a means to promote sustainability has advantages not just for the environment, but also for the overall health and welfare of patients, workers, and the wider community.

Hospital organizations have the potential to enhance their overall performance and achieve sustained results by using TQM principles. TQM provides a systematic method for identifying and addressing areas that require enhancement, promoting collaboration, and fostering a culture focused on excellence and long-term sustainability.

Competition creates pressure on healthcare organizations to gain cost-effective and higher-quality care. Also, actors in the external environment of hospitals like the government, other agencies, and customers put pressure on hospitals for quality. TQM is one of the perspectives organizations can use to improve their service quality. Organizations aspire to embrace a TQM culture for the sake of long-term sustainability. However, they consistently struggle to implement it successfully in the absence of a TQM culture. Kennedy and Fiss [93] explained TQM adoption based on the institutional theory and they indicated that early and late adopters have different motivators to implement TQM. While efficiency motivates early adopters, legitimacy motivates late adopters to implement TQM.

Many firms have experienced significant advantages by effectively adopting the TQM program, which enables them to sustain their business development. Implementing the TQM program with a focus on sustainability results in increased productivity and improved performance [94], and ultimately leads to achieving excellence and gaining market share [5].

There exist correlations between the implementation of total quality management principles and the concept of sustainability. TQM system has a beneficial impact on environmental sustainability [95]. TQM's objective is to minimize waste by eliminating operational inefficiencies, while environmental protection strategies effectively reduce noise, air pollutants, and hazardous waste [65]. The pursuit of achieving zero defects in Quality Management (QM) and the waste reduction philosophy in lean management are closely aligned with the goals of the environmental management system to completely eliminate waste [96]. This correlation is applicable not only to industrial establishments, but also to hospitals with service establishments.

Recently, total quality management implementation seems to have had a substantial impact on businesses' effectiveness [97]. In this study, we focus on the relationship between TQM practices and identifying their effects on the various dimensions of performance in hospitals. We gained important findings that will help hospitals to have better performance. Operational performance is determined as an antecedent of financial performance. For better service quality and positive financial results, various activities and procedures should be implemented. Higher productivity rates, fewer mistakes, shorter delivery and waiting times, and fewer complaints raise the tendency of customers to pay more and to give priority to alternative hospitals. This study confirmed that customer focus and process management influence the financial performance of hospitals positively. On the other hand, Macinati [98] stated a lack of a significant relationship between financial performance and quality management in the Italian healthcare industry. The reason is explained as the difficulty of simultaneously conducting quality and efficiency.

Customer focus is the strongest practice to improve both operational performance and financial performance. Mosadeghrad [12] stated a similar finding regarding a positive relationship between customer management and performance in Iranian hospitals. If hospitals meet customers' necessities and expectations and organize activities related to customer relationship management, the contribution of customer focus on operational and financial performance will be realized. This result supports customer focus as a facilitator of gaining competitive advantage. Beyond this, hospitals should try to develop customer loyalty. Satisfied patients and loyalty will help hospitals not only gain a competitive advantage, but also help hospitals become more sustainable.

In addition to customer focus, supplier relations, and management leadership are more likely to be useful than efforts to improve process management, employee involvement, and continuous improvement.

The findings of this study contribute to presenting a perspective to implement TQM practices in developing countries. As stated by Mosadeghrad [12], different countries may need different TQM models to implement. Secondly, both the quality management and healthcare literature may take advantage of these findings. Thirdly, a valid and reliable questionnaire was developed. Fourthly, hospitals in the country may use findings as guidelines to constitute a quality management structure and define priorities to manage quality practically. Therefore, hospitals must begin their paths with a customer-focused strategy, which will enhance their operational and financial performance. Lastly, this study was conducted in the service industry. From a broad perspective, providing service quality is not only necessary for the long-term profitability of the service industry, but also the manufacturing industry may use these findings as an initial stage of offering service quality. The manufacturing industry may differentiate its position based on its service quality.

Based on this study, we can suggest that hospitals should support their patients to lead them in evaluating processes of service quality. Beyond patient satisfaction surveys, hospitals can establish patient suggestion boxes to allow customers to become more involved in service. Developing and using an effective customer database can help hospitals

understand customer needs. It helps them to realize how their services can differ from their competitors. Not only the satisfaction of patients but also of families of patients should be taken into consideration to improve service quality.

Like all studies, this study has some limitations. Our sample includes both private and public hospitals. We are unable, however, to compare results from the two types of institutions, because the representation of private hospitals in the sample was much lower than public hospitals. Future studies should investigate the differences between private and public hospitals. Collecting data from different countries may also shed more light on the role of TQM practices on facets of performance. The influence of culture on the adoption of TQM may represent different patterns. As a future study suggestion, cultural issues can be added to the research model. We were also unable to test the differences between the time before TQM was implemented and after TQM was implemented. This is another limitation of our study. Longitudinal studies are suggested to measure TQM practices across a period of time.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Measurement Scales, Survey Items, and Their Sources

A.1. Leadership of Management

L.1. Managers of all departments of the hospitals accept their responsibilities for quality. *

L.2. Hospital management provides individual leadership to improve service quality.

L.3. In the hospital, all managers encourage employees to serve on time.

L.4. Top management encourages employees to attend to service processes.

L.5. Hospital management creates a vision focused on quality improvement.

L.6. Hospital management attends to quality improvement projects individually.

A.2. Decision Making

DM1. Knowledge about quality is a tool to manage quality.*

DM2. Knowledge about quality is handled to assess managers and supervisors. *

DM3. Before creating service and serving the customer, innovations are revised attentively.

DM4. Coordination is provided between departments that are effective in creating quality service.

DM5. New service and quality are emphasized based on the cost and objectives of the department.

A.3. Continuous Improvement

CI1. In the hospital, professional and technical training is given to employees.

CI2. In the hospital, quality training is given to employees.

CI3. In the hospital, quality managers and quality supervisors have been trained.

CI4. In the hospital, Total Quality Management training is given (philosophy of quality responsibility).

A.4. Customer focus

CF1. The needs of the patient are provided to disseminate and be understandable in the hospital. *

CF2. We know the current and future needs of patients.

CF3. We often communicate closely with our patients.

CF4. Our patients express their pleasures verbally.

CF5. Managers and supervisors encourage patient satisfaction development activities. **

CF6. The most important thing is to provide patient satisfaction and meet expectations.

CF7. Managers always emphasize the importance of patient satisfaction.

A.5. Employee Involvement

EI1. We try to evaluate the ideas of team members before decision making to solve problems. *

EI2. We implement a team problem-solving system.

EI3. Many problems have been solved by small team sessions for the last three years.

EI4. Problem-solving teams contribute to developing service processes.

EI5. Employees are encouraged to solve their problems on their own.

A.6. Process Management

PM1. Processes in the hospital are managed with statistical quality.

PM2. Comprehensive statistical methods are used to decrease incompatibility among processes.

PM3. Charts are handled based on whether service processes are under control.

PM4. Process is followed by statistical process.

PM5. Processes are often audited, revised, and controlled.

PM6. Distribution of service programs or services is balanced. *

PM7. Job or process definitions are given directly to employees. *

A.7. Relations with Suppliers

RS1. We help suppliers enhance their performance for just-in-time manufacturing and delivery capability. *

RS2. We give importance to quality instead of price when choosing a supplier.

RS3. We consider quality dependency when choosing a supplier.

RS4. We consider process ability when choosing a supplier.

RS5. We consider commitment to "continuous improvement" when choosing a supplier.

A.8. Operational and Quality Performance

QP1. Service quality is increasing.

QP2. Productivity rates are increasing. *

QP3. Rate of faulty transactions is decreasing.

QP4. Delivery time for buying materials is becoming shorter.

QP5. Presentation time of treatment services is becoming shorter.

QP6. Patient complaints are decreasing.

QP7. The degree of patient satisfaction is increasing.

QP8. Rate of faulty services in clinics is decreasing.

QP9. Quality in clinics meets or exceeds patient demands.

A.9. Financial Performance

FP1. Hospital revenues are increasing.
FP2. The market share of the hospital is increasing.
* omitted items because of low factor loading.
** corrected inter-item correlation coefficient (0.418) is lower than (0.500).

References

1. Abbas, J. Impact of Total Quality Management on Corporate Sustainability through the Mediating Effect of Knowledge Management. *J. Clean. Prod.* **2020**, *244*, 118806. [CrossRef]
2. Li, D.; Zhao, Y.; Zhang, L.; Chen, X.; Cao, C. Impact of Quality Management on Green Innovation. *J. Clean. Prod.* **2018**, *170*, 462–470. [CrossRef]
3. Gorski, H. Leadership and Corporate Social Responsibility. *Int. Conf. Knowl.-Based Organ.* **2017**, *23*, 372–377. [CrossRef]
4. Singh, V.; Kumar, A.; Singh, T. Impact of TQM on Organisational Performance: The Case of Indian Manufacturing and Service Industry. *Oper. Res. Perspect.* **2018**, *5*, 199–217. [CrossRef]
5. Kumar, V.; Verma, P.; Mangla, S.K.; Mishra, A.; Chowdhary, D.; Sung, C.H.; Lai, K.K. Barriers to Total Quality Management for Sustainability in Indian Organizations. *Int. J. Qual. Reliab. Manag.* **2020**, *37*, 1007–1031. [CrossRef]
6. Talapatra, S.; Uddin, M.K. Prioritizing the Barriers of TQM Implementation from the Perspective of Garment Sector in Developing Countries. *Benchmarking* **2019**, *26*, 2205–2224. [CrossRef]
7. Anderson, J.A. Evolution of the Health Care Quality Journey. *J. Leg. Med.* **2010**, *31*, 59–72. [CrossRef]
8. Parasuraman, A.; Zeithaml, V.A.; Berry, L.L. A Conceptual Model of Service Quality and Its Implications for Future Research. *J. Mark.* **1985**, *49*, 41–50. [CrossRef]
9. Zabada, C.; Rivers, A.P.; Munchus, G. Obstacles to the Application of Total Quality Management in Health Care Organizations. *Total Qual. Manag.* **1998**, *9*, 57–66. [CrossRef]
10. Tomes, A.E.; Chee Peng Ng, S. Service Quality in Hospital Care: The Development of an in-Patient Questionnaire. *Int. J. Health Care Qual. Assur.* **1995**, *8*, 25–33. [CrossRef]
11. Rashid, W.E.W.; Jusoff, H.K. Service Quality in Health Care Setting. *Int. J. Health Care Qual. Assur.* **2009**, *22*, 471–482. [CrossRef] [PubMed]
12. Mosadeghrad, A. Developing and Validating a Total Quality Management Model for Healthcare Organizations. *TQM J.* **2015**, *27*, 544–564. [CrossRef]
13. Brambilla, A.; Apel, J.M.; Schmidt-Ross, I.; Buffoli, M.; Capolongo, S. Testing of a Multiple Criteria Assessment Tool for Healthcare Facilities Quality and Sustainability: The Case of German Hospitals. *Sustainability* **2022**, *14*, 16742. [CrossRef]
14. Cavicchi, C.; Oppi, C.; Vagnoni, E. Back and Forth on Sustainable Development: A Focus on Healthcare Organisations. *Sustainability* **2022**, *14*, 4958. [CrossRef]
15. Swinehart, K.; Green, R.F. Continuous Improvement and TQM in Health Care: An Emerging Operational Paradigm Becomes a Strategic Imperative. *Int. J. Health Care Qual. Assur.* **1995**, *8*, 23–27. [CrossRef]
16. Kessler, D.; Geppert, J. *The Effects of Competition on Variation in the Quality and Cost of Medical Care*; National Bureau of Economic Research: Cambridge, MA, USA, 2005.
17. Cooper, Z.; Gibbons, S.; Jones, S.; McGuire, A. Does Hospital Competition Save Lives? Evidence from the English NHS Patient Choice Reforms. *Econ. J.* **2011**, *121*, 228–260. [CrossRef]
18. Wardhani, V.; Utarini, A.; Van Dijk, J.; Post, D.; Groothoff, J. Determinants of Quality Management Systems Implementation in Hospitals. *Health Policy* **2009**, *89*, 239–251. [CrossRef]
19. Cheng Lim, P.; Tang, N.K.H. The development of a model for total quality healthcare. *Manag. Serv. Qual. Int. J.* **2000**, *10*, 103–111. [CrossRef]
20. Rodger, J.A.; Pendharkar, P.C.; Paper, D.J. Management of Information Technology and Quality Perfor-Mance in Healthcare Facilities. *Int. J. Appl. Qual. Manag.* **1999**, *2*, 251–269. [CrossRef]
21. Nilsson, L.; Johnson, M.D.; Gustafsson, A. The Impact of Quality Practices on Customer Satis-Faction and Business Results: Product versus Service Organizations. *J. Qual. Manag.* **2001**, *6*, 5–27. [CrossRef]
22. Zeithaml, V.A.; Berry, L.L.; Parasuraman, A. The Behavioral Consequences of Service Quality. *J. Mark.* **1996**, *60*, 31. [CrossRef]
23. Grönroos, C. A Service Quality Model and Its Marketing Implications. *Eur. J. Mark.* **1984**, *18*, 36–44. [CrossRef]
24. Andaleeb, S.S. Public and Private Hospitals in Bangladesh: Service Quality and Predictors of Hospital Choice. *Health Policy Plan.* **2000**, *15*, 95–102. [CrossRef] [PubMed]
25. Donabedian, A. The Quality of Care: How Can It Be Assessed? *J. Am. Med. Assoc.* **1988**, *260*, 1743–1748. [CrossRef]
26. Douglas, T.J.; Judge, W.Q. Total Quality Management Implementation and Competitive Advantage: The Role of Structural Control and Exploration. *Acad. Manag. J.* **2001**, *44*, 158–169. [CrossRef]
27. Sureshchander, G.; Rajendran, C.; Anantharaman, R. A Conceptual Model for Total Quality Management in Service Organizations. *Total Qual. Manag.* **2001**, *12*, 343–363. [CrossRef]
28. Yang, C.-C. The Establishment of a TQM System for the Health Care Industry. *TQM Mag.* **2003**, *15*, 93–98. [CrossRef]

29. Lagrosen, Y.; Lagrosen, S. Creating a Culture for Sustainability and Quality-a Lean-Inspired Way of Working. *Total Qual. Manag. Bus. Excell.* **2019**, 1–15. [CrossRef]
30. Conca, F.J.; Llopis, J.; Tarí, J.J. Development of a Measure to Assess Quality Management in Certified Firms. *Eur. J. Oper. Res.* **2004**, *156*, 683–697. [CrossRef]
31. Deming, W. *Quality, Productivity and Competitive Position*; MIT Center for Advanced Engineering: Cambridge, MA, USA, 1982.
32. Juran, J. *On Planning for Quality*; Collier Macmillian: London, UK, 1988.
33. Puffer, S.M.; McCarthy, D.J. A Framework for Leadership in a TQM Context. *J. Qual. Manag.* **1996**, *1*, 109–130. [CrossRef]
34. Koumoutzis, N. Make Behavioral Considerations Your First Priority in Quality Improvements. *Ind. Eng.* **1994**, *26*, 63–65.
35. Tarí, J.J.; Molina, J.F.; Castejón, J.L. The Relationship between Quality Management Practices and Their Effects on Quality Outcomes. *Eur. J. Oper. Res.* **2007**, *183*, 483–501. [CrossRef]
36. Daft, R. *New Era of Management*; South Western Cengage Learning: Mason, OH, USA, 2008.
37. Lee, S.; Choi, K.-S.; Kang, H.-Y.; Cho, W.; Chae, Y.M. Assessing the Factors Influencing Continuous Quality Improvement Implementation: Experience in Korean Hospitals. *Int. J. Qual. Health Care* **2002**, *14*, 383–391. [CrossRef] [PubMed]
38. Zehir, C.; Ozsahin, M. A Field Research on the Relationship Between Strategic Decision Making Speed and Innovation Performance in the Case of Turkish Large Scale Firms. *Manag. Decis.* **2008**, *46*, 709–724. [CrossRef]
39. Ittner, C.D.; Larcker, D.F. The Performance Effects of Process Management Techniques. *Manag. Sci.* **1997**, *43*, 522–534. [CrossRef]
40. Reed, R.; Lemak, D.J.; Montgomery, J.C. Beyond Process: TQM Content and Firm Performance. *Acad. Manag. Rev.* **1996**, *21*, 173–202. [CrossRef]
41. Park, D.; Dahlgaard, S.M. Organizational Learnability and Innovability: A System for Assessing, Diagnosing and Improving Innovations. *Acad. Manag. Rev.* **1994**, *19*, 392–418. [CrossRef]
42. Bowen, D.E. Managing Customers as Human Resources in Service Organizations. *Hum. Resour. Manag.* **1986**, *25*, 371–383. [CrossRef]
43. Acquah, I.S.K.; Quaicoe, J.; Arhin, M. How to Invest in Total Quality Management Practices for Enhanced Operational Performance: Findings from PLS-SEM and FsQCA. *TQM J.* **2023**, *35*, 1830–1859. [CrossRef]
44. Qasrawi, B.T.; Almahamid, S.M.; Qasrawi, S.T. The Impact of TQM Practices and KM Processes on Organisational Performance: An Empirical Investigation. *Int. J. Qual. Reliab. Manag.* **2017**, *34*, 1034–1055. [CrossRef]
45. Manatos, M.J.; Sarrico, C.S.; Rosa, M.J. The Integration of Quality Management in Higher Education Institutions: A Systematic Literature Review. *Total Qual. Manag. Bus. Excel.* **2017**, *28*, 159–175. [CrossRef]
46. Mohammad Mosadegh Rad, A. A survey of total quality management in Iran: Barriers to successful implementation in health care organizations. *Leadersh. Health Serv.* **2005**, *18*, 12–34. [CrossRef] [PubMed]
47. Anderson, H.C. Teamwork Brings TQM to Health Care. *Manag. Serv. Qual.* **1994**, *4*, 35–38. [CrossRef]
48. Matej, Z.; Matjaz, M.; Damjan, M.; Bostjan, G. Quality Management Systems as a Link between Management and Employees. *Total Qual. Manag. Bus. Excell.* **2012**, *23*, 45–62. [CrossRef]
49. Welikala, D.; Sohal, A. Total Quality Management and Employees' Involvement: A Case Study of an Australian Organisation. *Total Qual. Manag. Bus. Excell.* **2008**, *19*, 627–642. [CrossRef]
50. Agus, A. An Empirical Test of TQM in Public Service Sector and Its Impact on Customer Satisfaction. *J. Qual. Meas. Anal.* **2005**, *1*, 47–60.
51. Ahmad, S.; Schroeder, R.G. The Importance of Recruitment and Selection Process for Sustainability of Total Quality Management. *Int. J. Qual. Reliab. Manag.* **2002**, *19*, 540–550. [CrossRef]
52. Flynn, B.B.; Schroeder, R.G.; Sakakibara, S. The Impact of Quality Management Practices on Performance and Competitive Advantage. *Decis. Sci.* **1995**, *26*, 659–691. [CrossRef]
53. Forza, C.; Filippini, R. TQM Impact on Quality Conformance and Customer Satisfaction: A Causal Model. *Int. J. Prod. Econ.* **1998**, *55*, 1–20. [CrossRef]
54. Trent, R.J.; Monczka, R.M. Achieving World-Class Supplier Quality. *Total Qual. Manag.* **1999**, *10*, 927–938. [CrossRef]
55. Kannan, V.R.; Tan, K.C. Just in Time, Total Quality Management, and Supply Chain Management: Understanding Their Linkages and Impact on Business Performance. *Omega* **2005**, *33*, 153–162. [CrossRef]
56. Krause, D.R.; Handfield, R.B.; Scannell, T.V. An Empirical Investigation of Supplier Development: Reactive and Strategic Processes. *J. Oper. Manag.* **1998**, *17*, 39–58. [CrossRef]
57. Kaynak, H. The Relationship between Total Quality Management Practices and Their Effects on Firm Performance. *J. Oper. Manag.* **2003**, *21*, 405–435. [CrossRef]
58. Zineldin, M. The Royalty of Loyalty: CRM, Quality and Retention. *J. Consum. Mark.* **2006**, *23*, 430–437. [CrossRef]
59. Wu, S.-I.; Chan, H.-J. Perceived Service Quality and Self-Concept Influences on Consumer Attitude and Purchase Process: A Comparison between Physical and Internet Channels. *Total Qual. Manag. Bus. Excel.* **2011**, *22*, 43–62. [CrossRef]
60. Sajid, M.S.; Baig, M.K. Quality of Health Care: An Absolute Necessity for Public Satisfaction. *Int. J. Health Care Qual. Assur.* **2007**, *20*, 545–548. [CrossRef]
61. Shafiq, M.; Lasrado, F.; Hafeez, K. The Effect of TQM on Organisational Performance: Empirical Evidence from the Textile Sector of a Developing Country Using SEM. *Total Qual. Manag. Bus. Excel.* **2019**, *30*, 31–52. [CrossRef]
62. Ho, S.K.M. Total Quality Management Transfer to Small and Medium Industries in Malaysia by SIRIM. *Total Qual. Manag.* **1995**, *6*, 273–286. [CrossRef]

63. Cronin, J.J., Jr.; Taylor, S.A. Servperf versus Servqual: Reconciling Performance-Based and Perceptions-Minus-Expectations Measurement of Service Quality. *J. Mark.* **1994**, *58*, 125–131. [CrossRef]
64. Alexander, J.A.; Weiner, B.J.; Griffith, J. Quality Improvement and Hospital Financial Performance. *J. Organ. Behav.* **2006**, *27*, 1003–1029. [CrossRef]
65. Tasleem, M.; Khan, N.; Nisar, A. Impact of Total Quality Management and Environmental Management System on Sustainable Performance of Selected Industries in Pakistan. *J. Environ. Sci. Manag.* **2018**, *21*, 30–38. [CrossRef]
66. Churchill, G.A., Jr. A Paradigm for Developing Better Measures of Marketing Constructs. *J. Mark. Res.* **1979**, *16*, 64–73. [CrossRef]
67. Cua, K.O.; McKone, K.E.; Schroeder, R.G. Relationships between Implementation of TQM, JIT, and TPM and Manufacturing Performance. *J. Oper. Manag.* **2001**, *19*, 675–694. [CrossRef]
68. Fuentes-Fuentes, M.M.; Ca, A.-S. Llorens-Montes FJ. The Impact of Environmental Characteristics on TQM Principles and Organizational Performance. *Omega* **2004**, *32*, 425–442. [CrossRef]
69. Saraph, J.V.; Benson, P.G.; Schroeder, R.G. An Instrument for Measuring the Critical Factors of Quality Management. *Decis. Sci.* **1989**, *20*, 810–829. [CrossRef]
70. Rahman, S.; Bullock, P. Soft TQM, Hard TQM and Organizational Performance Relationships: An Empirical Investigation. *Omega* **2005**, *33*, 73–83. [CrossRef]
71. Chong, V.K.; Rundus, M.J. Total Quality Management, Market Competition and Organizational Performance. *Br. Account. Rev.* **2004**, *36*, 155–172. [CrossRef]
72. Bagozzi, R.; Philips, L. Representing and Testing Organizational Theories: A Holistic Construct. *Adm. Sci. Q.* **1982**, *27*, 459–489. [CrossRef]
73. Wheaton, B.; Muthen, B.; Alwin, D.F.; Summers, G.F. Assessing Reliability and Stability in Panel Models. *Sociol. Methodol.* **1977**, *8*, 84. [CrossRef]
74. Marsh, H.; Hocevar, D. Application of Confirmatory Factor Analysis to the Study of Self-Concept: First and Higher Order Factor Structures and Their Invariance Across Groups. *Psychol. Bull.* **1985**, *97*, 562–582. [CrossRef]
75. Carmines, E.; Mciver, J. Analyzing Models with Unobserved Variables: Analysis of Covariance Structures. In *Social Measurement: Current Issues*; Bohrnstedt, G., Borgatta, E., Eds.; Sage Publications, Inc.: Beverly Hills, CA, USA, 1981; pp. 65–115.
76. Chau, P.Y.K. Reexamining a Model for Evaluating Information Center Success Using a Structural Equation Modeling Approach. *Decis. Sci.* **1997**, *28*, 309–334. [CrossRef]
77. Arbuckle, J.L. *AMOS 16.0*; Amos Development Corporation: Spring House, PA, USA, 2007.
78. Fornell, D.; Larcker, D. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *J. Mark. Res.* **1981**, *18*, 39–50. [CrossRef]
79. Sarstedt, M.; Ringle, C.M.; Smith, D.; Reams, R.; Hair, J.F., Jr. Partial least squares structural equation modeling (PLS-SEM): A useful tool for family business researchers. *J. Fam. Bus. Strategy* **2014**, *5*, 105–115. [CrossRef]
80. Henseler, J.; Ringle, C.M.; Sinkovics, R.R. The Use of Partial Least Squares Path Modeling in International Marketing. In *Advances in International Marketing*; Emerald Group Publishing Limited: Bingley, UK, 2009; Volume 20, pp. 277–319. [CrossRef]
81. Hair, J.F.; Christian, M.; Ringle, M. *A Primer on Partial Least Squares Structural Equation Modeling*; Sage: Thousand Oaks, CA, USA, 2014.
82. Nair, A. Meta-Analysis of the Relationship between Quality Management Practices and Firm Performance Implications for Quality Management Theory Development. *J. Oper. Manag.* **2006**, *24*, 948–975. [CrossRef]
83. Dagger, T.C.; Sweeney, J.C.; Johnson, L.W. A Hierarchical Model of Health Service Quality: Scale Development and Investigation of Integrated Model. *J. Serv. Res.* **2007**, *10*, 123–142. [CrossRef]
84. Tanninen, K.; Puumalainen, K.; Sandström, J. The Power of TQM: Analysis of Its Effects on Profitability, Productivity and Customer Satisfaction. *Total Qual. Manag. Bus. Excel.* **2010**, *21*, 171–184. [CrossRef]
85. Andaleeb, S.S.; Siddiqui, N.; Khandakar, S. Patient Satisfaction with Health Services in Bangladesh. *Health Policy Plan.* **2007**, *22*, 263–273. [CrossRef]
86. Naidu, A. Factors Affecting Patient Satisfaction and Healthcare Quality. *Int. J. Health Care Qual. Assur.* **2009**, *22*, 366–381. [CrossRef]
87. Sadikoglu, E.; Zehir, C. Investigating the Effects of Innovation and Employee Performance on the Relationship between Total Quality Management Practices and Firm Performance: An Empirical Study of Turkish Firms. *Int. J. Prod. Econ.* **2010**, *127*, 13–26. [CrossRef]
88. Khan, B.A.; Naeem, H. Measuring the Impact of Soft and Hard Quality Practices on Service Innovation and Organisational Performance. *Total Qual. Manag. Bus. Excel.* **2016**, *29*, 1402–1426. [CrossRef]
89. Lee, S.M.; Lee, D. Developing Green Healthcare Activities in the Total Quality Management Framework. *Int. J. Environ. Res. Public Health* **2022**, *19*, 6504. [CrossRef]
90. Lee, S.M.; Lee, D.; Olson, D.L. Health-Care Quality Management Using the MBHCP Excellence Model. *Total Qual. Manag. Bus. Excel.* **2013**, *24*, 119–137. [CrossRef]
91. Newman, K.; Maylor, U.; Chansarkar, B. The Nurse Retention, Quality of Care and Patient Satisfaction Chain. *Int. J. Health Care Qual. Assur. Inc. Leadersh. Health Serv.* **2001**, *14*, 57–68. [CrossRef]
92. Zehir, C.; Sadikoğlu, E. Relationships among Total Quality Management Practices: An Empirical Study in Turkish Industry. *Int. J. Perform. Enginneering* **2012**, *8*, 667–678.

93. Kennedy, M.T.; Fiss, P.C. Institutionalization, Framing, and Diffusion: The Logic of TQM Adoption and Implementation Decisions among U.s. Hospitals. *Acad. Manag. J.* **2009**, *52*, 897–918. [CrossRef]
94. Isaksson, R. Total Quality Management for Sustainable Development: Process Based System Models. *Bus. Proc.Manag. J.* **2006**, *12*, 632–645. [CrossRef]
95. Jum'a, L.; Alkalha, Z.; Al Mandil, K.; Alaraj, M. Exploring the Influence of Lean Manufacturing and Total Quality Management Practices on Environmental Sustainability: The Moderating Role of Quality Culture. *Int. J. Lean Six Sigma* 2023, *ahead of print*. [CrossRef]
96. Molina-Azorín, J.F.; Tarí, J.J.; Claver-Cortés, E.; López-Gamero, M.D. Quality Management, Environmental Management and Firm Performance: A Review of Empirical Studies and Issues of Integration. *Int. J. Manag. Rev.* **2009**, *11*, 197–222. [CrossRef]
97. Niyi Anifowose, O.; Ghasemi, M.; Olaleye, B.R. Total Quality Management and Small and Medium-Sized Enterprises' (SMEs) Performance: Mediating Role of Innovation Speed. *Sustainability* **2022**, *14*, 8719. [CrossRef]
98. Macinati, M.S. The Relationship between Quality Management Systems and Organizational Performance in the Italian National Health Service. *Health Policy* **2008**, *85*, 228–241. [CrossRef]

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