JOEEP

e-ISSN: 2651-5318
Journal Homepage: http://dergipark.org.tr/joeep

Araştırma Makalesi ● Research Article

The Mediating Role of In-Service Training in the Effect of Demographic Variables on Total Quality Management *

Demografik Değişkenlerin Toplam Kalite Yönetimine Etkisinde Hizmet Içi Eğitimin Aracilik Rolü

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MAKALE BİLGİSİ

Makale Geçmişi:
Başvuru tarihi: 29 Nisan 2025
Düzeltme tarihi: 2 Kasım 2025
Kabul tarihi: 1 Aralık 2025

Anahtar Kelimeler:
Hizmet İçi Eğitim Programları
Toplam Kalite Yönetimi
Sağlık Hizmetleri

ÖZ

Bu araştırma, İstanbul ilinde görev yapan doktor ve hemşirelerin hizmet içi eğitim programlarını Toplam Kalite Yönetimi (TKY) açısından nasıl değerlendirdiklerini belirlemeyi amaçlamaktadır. Çalışma, 350 sağlık çalışanının katılımıyla yürütülmüş; veri toplama aracı olarak Al-Assaf ve Gentling'in TKY anketi ile Örücü ve Kanbur tarafından geliştirilen hizmet içi eğitim ölçeği kullanılmıştır. Katılımcıların %56'sı kadın, %44'ü erkektir. Yaş, medeni durum ve eğitim düzeyleri çeşitli gruplarda temsil edilmiştir. Katılımcıların %72'si hizmet içi eğitimleri verimli bulurken, %40,5'i TKY konusunda eğitim almadığını ifade etmiştir. Genel olarak çalışanların TKY'ye yönelik algıları olumlu bulunmuştur. Araştırma sonucunda, sağlık kurumlarında hizmet içi eğitimlerin verimliliğini artırmak ve TKY uygulamalarını yaygınlaştırmak adına önerilerde bulunulmuştur.

ARTICLE INFO

Article history:
Received: April 29, 2025
Received in revised form: Nov 2, 2025
Accepted: Dec 1, 2025

Keywords:
In-Service Training Programs
Total Quality Management (TQM)
Healthcare Services

ABSTRACT

This study aims to determine how doctors and nurses working in Istanbul evaluate in-service training programs in terms of Total Quality Management (TQM). The study was conducted with the participation of 350 healthcare workers; Al-Assaf and Gentling's TQM survey and the in-service training scale developed by Örücü and Kanbur were used as data collection tools. 56% of the participants were female and 44% were male. Age, marital status and education levels were represented in various groups. While 72% of the participants found in-service trainings productive, 40.5% stated that they had not received training on TQM. In general, employees' perceptions of TQM were found to be positive. As a result of the study, suggestions were made to increase the efficiency of in-service trainings in healthcare institutions and to spread TQM practices.

1. Introduction

In the contemporary landscape of healthcare, the pursuit of excellence necessitates the adoption of comprehensive management strategies that encompass all facets of service delivery. Total Quality Management (TQM) stands at the forefront of these strategies, emphasizing continuous improvement, patient satisfaction, and organizational effectiveness. TQM's principles are particularly pertinent in healthcare settings, where the complexity of services and the critical nature of patient care demand rigorous quality standards.

* Ethics committee permission was given by İstanbul Esenyurt University Ethics Committee Commission for the survey application of this study, with the decision no. 2025/02 dated 20.03.2025.

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Atıf/Cite as: Toksöz, S. (2024). The Mediating Role of In-Service Training in the Effect of Demographic Variables on Total Quality Management. *Journal of Emerging Economies and Policy*, 10(2), 224-233.

Healthcare organizations are inherently complex, characterized by diverse services, multidisciplinary teams, and a dynamic environment. In such settings, ensuring consistent quality is paramount. TQM provides a structured framework that integrates quality improvement into every aspect of healthcare delivery. By focusing on patient-centered care, employee involvement, and systematic processes, TQM aims to enhance service quality, reduce errors, and improve patient outcomes. The implementation of TQM in healthcare has been associated with improved patient satisfaction, better clinical outcomes, and enhanced operational efficiency (Aichouni et al., 2024 Karaşin & Öztırak, 2023).

Central to the successful implementation of TQM is the continuous development of healthcare professionals. In-service training programs serve as a vital mechanism for equipping staff with the necessary skills and knowledge to adhere to quality standards. These programs facilitate the dissemination of best practices, introduce new technologies, and foster a culture of continuous learning. By aligning training initiatives with TQM objectives, healthcare organizations can ensure that their workforce is adept at meeting the evolving demands of quality care Jiang et al., 2024).

While the structural and procedural aspects of TQM are well-documented, the human element—comprising the healthcare workforce—is equally crucial. Demographic variables such as age, gender, marital status, educational background, and professional experience can significantly influence how healthcare professionals perceive and engage with TQM initiatives. For instance, younger staff members may exhibit different attitudes towards quality improvement compared to their more experienced counterparts. Similarly, individuals with higher educational qualifications might have a deeper understanding of quality management principles, potentially leading to more favorable perceptions of TQM (Kaiseroglou et al., 2024).

Understanding these demographic influences is essential for tailoring TQM strategies that resonate with the diverse workforce in healthcare settings. By recognizing and addressing the unique perspectives and needs of different demographic groups, healthcare organizations can foster a more inclusive and effective quality improvement culture

The relationship between in-service training and TQM perceptions is multifaceted. Training programs not only impart technical skills but also shape attitudes and behaviors towards quality practices. The effectiveness of these programs can vary across different demographic groups. For example, younger employees may benefit from interactive and technology-driven training methods, while older staff might prefer traditional, face-to-face learning experiences. Similarly, individuals with varying educational backgrounds may require different levels of content complexity and delivery styles (Dezi et al., 2025).

Moreover, demographic factors can influence the accessibility and engagement with training opportunities. Married individuals with familial responsibilities might face challenges in attending training sessions, whereas single professionals may have more flexibility. Recognizing these variations allows healthcare organizations to design and implement training programs that are equitable and accessible to all staff members, thereby maximizing the potential for TQM success (Koomson, 2025).

This study posits that in-service training serves a mediating role in the relationship between demographic variables and TQM perceptions. By enhancing the skills and knowledge of healthcare professionals, training programs can mitigate the disparities in TQM perceptions arising from demographic differences. For instance, targeted training initiatives can bridge the knowledge gap between younger and older staff, fostering a more uniform understanding of quality management principles across the workforce (Urbański et al., 2025).

Furthermore, in-service training can empower employees by involving them in the quality improvement process, thereby increasing their commitment and engagement. This empowerment is particularly crucial in healthcare settings, where staff motivation directly impacts patient care quality. By aligning training programs with the specific needs and characteristics of different demographic groups, healthcare organizations can enhance the overall effectiveness of their TQM initiatives (Waseem & Yusoff, 2025).

The healthcare landscape in Istanbul presents a unique context for examining the dynamics of TQM implementation. As a major metropolitan city, Istanbul's healthcare sector is characterized by a diverse and multicultural workforce, encompassing a wide range of demographic profiles. This diversity offers a rich backdrop for investigating how demographic variables influence perceptions of TQM and the role of in-service training in shaping these perceptions (Abdelnaeim et al., 2025; Öztırak & Karaşin, 2023).

Moreover, Istanbul's healthcare institutions are increasingly adopting TQM principles to improve service delivery amidst growing patient expectations and resource constraints. Understanding the interplay between demographic factors, in-service training, and TQM perceptions in this context can provide valuable insights for healthcare administrators seeking to enhance quality management practices.

2. Conceptual Framework

2.1. Total Quality Management in Healthcare

The concept of total quality in health services is seen as continuous improvement, full participation of health workers in the process, ensuring patient safety, services where the expectations and needs of patients and their relatives are correctly understood and met, effective and efficient treatment services are provided at low cost and

patient satisfaction is ensured. Continuous improvement and development are important in total quality management. In TQM in health; in the same way, the process must be constantly renewed and improved and better ways must always be sought for quality service. In institutions where health services are provided, the principle of not harming is adopted first, with the full participation of health workers, continuous training, good leadership guidance, patient safety and satisfaction are ensured and the process is constantly renewed and improved (Nga et al., 2025).

The concept of quality in health services is a situation that is also expressed as just-in-time, appropriate and correct diagnosis and treatment. The basic objectives of TQM are as follows (Kundu et al., 2025):

• Determining quality standards

• Ensuring full participation by teamwork

• Continuous improvement, renewal and development of the process

• Having quality education and experience of health personnel

• Providing continuous training

• Ensuring efficient use of all resources

• Establishing healthy communication

• Prevention of errors should be supported

• The process should be carried out with a completely effective leader

• More effective treatment services should be provided

• The aim is to ensure the satisfaction of patients and their relatives.

The aim of TQM can be expressed as ensuring the satisfaction of health service users as a result of reliable, low-cost, high-quality service provided with the zero-error rule and the right timing and correct work done the first time.

Total Quality Management (TQM) is a management philosophy that aims to continuously improve quality in all processes of organizations. In the healthcare sector, the aim of TQM is to increase the quality of patient care, ensure efficiency in services and increase employee satisfaction. TQM is considered a systematic quality improvement process in healthcare services and includes the following elements:

Patient focus: In order to provide quality care in healthcare services, patient satisfaction and safety are prioritized (Saçlık et al., 2020).

Employee participation: Active participation of healthcare professionals in quality improvement processes is critical to the success of TQM (Hassan et al., 2020).

Continuous improvement: TQM is based on the principle of continuous evaluation and improvement of processes in healthcare institutions (Jones and Kelly, 2021).

The healthcare sector is a critical area that directly affects the quality of life of patients. In this context, the applications of TQM; It covers many purposes such as increasing patient satisfaction, reducing care errors, ensuring continuity in health services, and creating excellence in patient care (Al-Assaf & Gentling, 2020).

2.2. In-Service Training in Healthcare

In-service training is the training that includes planned and practical activities carried out outside of formal education so that employees can carry their skills, knowledge, attitudes, and professional information learned in formal education to the highest levels (Oldroyd & Hall, 1991).

There are 3 basic elements in in-service training:

• Providing employees with skills related to their job,

• Providing the information necessary for employees to acquire skills,

• Organizing activities so that employees can positively direct their behaviors

In addition to these elements, another issue can be mentioned. Employees provide service within a certain area. This area has legal, physical, administrative and human conditions. Since general education and formal education are not carried out in such an area, no matter how advanced it is in terms of profession and technique, it cannot provide the qualifications of the manpower needs of various basic and sub-segments. This can be shown as one of the important reasons for in-service training. (Tanyeli, 1967, p.:64).

Today, innovations are rapidly and continuously encountered in every field. In order for institutions to catch up with all these developments and innovations, they need employees who are knowledgeable, equipped, experienced, self-improving and renewing. For this reason, in-service training programs have gained great importance today and are provided in accordance with the institution's goals in a way that covers the entire business life of the personnel. With in-service training, the quality of the workforce of the employees increases and their productivity is improved.

The Ministry of Health has given the necessary value to in-service training and supported it with laws and circulars that ensure its continuity and commitment to the program. The General Directorate of Treatment Services published a circular in 2001. In this circular, it aimed to increase the efficiency, reliability and effectiveness as a result of the National Health Reform and to increase the morale and motivation of the personnel. For this reason, since 1992, the Ministry of Health has notified the institutions within its body to provide training to the employees. It has been

decided that the trainings will be planned and followed up by the Provincial Health Directorate.

Healthcare institutions should support their employees to increase their knowledge and experience in order to provide service activities. When it comes to the socialization of health services, the concepts of service and education should be considered together. This situation contributes greatly to the institution. The aims of education in the In-Service Training Regulation issued by the SB in 1983 are to provide training to employees in health institutions as a result of the conditions of the time and to ensure that they are equipped with the knowledge, skills and abilities included in their duties.

In-service training can be provided on-the-job or off-the-job, as well as centrally and institutionally.

The types of on-the-job in-service training are as follows (Efil, 1998: 139):

• Training and guidance under the supervision of the manager,

• Job rotation,

• Assisting the manager,

• Special projects and selected readings,

• Delegation of authority and decentralization,

• Training through committees.

In-service training is training conducted in the workplace that aims to improve the professional skills of healthcare professionals. In-service training is of great importance in the healthcare sector because it helps employees develop behaviors in accordance with TQM principles and contributes to the improvement of processes.

Training Content and Needs Analysis: In-service training content for healthcare professionals should be customized according to the knowledge levels of employees and should include the basic principles of TQM. Training covers topics such as quality management, patient safety, ethical rules and patient relations (Bergman & Klefsjö, 2021).

Continuity of Training: Continuous training ensures that healthcare professionals are equipped with up-to-date knowledge and skills. This supports both professional development and enables the improvement of service quality (Hassan & Sattar, 2021).

Motivation and Participation of Employees: Training increases healthcare professionals' commitment to TQM and encourages them to actively participate in quality improvement processes. Trainings improve the qualitative and quantitative performance of employees (Zakuan et al., 2021).

2.3. Relationship Between TQM and In-Service Training

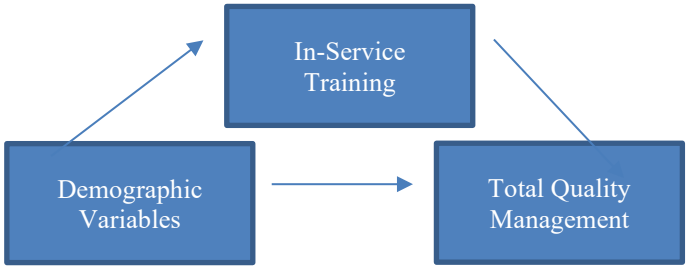
There is a strong relationship between Total Quality Management (TQM) and in-service training. This relationship indicates that training processes are a fundamental building block for healthcare institutions to provide quality service. Trainings make it easier for healthcare professionals to understand and implement the principles of TQM. Below are some points that will better explain the relationship between these two concepts:

Training Increases the Applicability of TQM: Training makes healthcare professionals aware of the principles of TQM. Through training, healthcare professionals develop the skills needed to improve the quality of patient care. This shows that trainings play a critical role in the successful implementation of TQM (López et al., 2020).

Promoting Collaboration and Teamwork Among Employees: TQM encourages employee participation in organizational improvement processes. In-service trainings help employees learn to work together and interact with each other to improve service quality. This strengthens teamwork, one of the fundamental elements of TQM (Cameron et al., 2020).

Continuous Improvement and Training: A continuous improvement process is necessary for the successful implementation of TQM. This continuous improvement depends on the training and development of healthcare professionals. Training supports healthcare professionals in adapting to the requirements of TQM and improving the deficiencies in the processes (Noruzi et al., 2020).

Model of the research



Hypotheses;

H1: The variable of working years indirectly positively and significantly affects the Total Quality Management score through In-Service Training.

H2: The variable of education level indirectly positively and significantly affects the Total Quality Management score through In-Service Training.

H3: The variable of age indirectly negatively and significantly affects the Total Quality Management score through In-Service Training.

3. Method

3.1. Purpose and Importance of the Research

Today's developing conditions bring about continuous and rapid changes and thus all aspects affect every aspect of life. (Selimoğlu & Yılmaz, 2009). Institutions will be affected the most by this process. With the increasing competition every passing day, adapting to change has become the most important focal point for institutions. The suitability of companies to developing internal and external environments and the role of education in this process are among the basic research focuses. The purpose of this study, which examines advanced education methods in detail, also indicates how necessary advanced education is. In a world where new changes and developments occur, the concept of quality has become one of the most frequently heard terms when examined from industrial, medical and social life. Since system quality is a process that will define development and progress, this article is valid for physicians and nursing groups in the institution. In this sense, the purpose of this study is to evaluate the general quality of education presentation and to determine and compare the attitudes and perceptions of physicians and nurses regarding general quality.

3.2. The Universe of the Research and Sampling Process

The population of the study is healthcare workers in Istanbul. The sample consists of 350 employees selected randomly from among the physician and nurse staff in Istanbul.

3.3. Data Collection Methods and Tools

The scales used in the study were compiled, edited and sent to willing participants via the internet. The surveys were answered using the opportunities provided by the internet and the survey presented to the groups was prepared in three parts. The first part includes questions regarding demographic data, while the second part includes data regarding continuing education. The third part includes findings regarding perceptions and statements regarding total quality management. Ethics committee permission was given by *İstanbul Esenyurt* University Ethics Committee Commission for the survey application of this study, with the decision no. 2025/02 dated 20.03.2025.

The information regarding the data collection tools of the study is explained below.

Personal Information Form: This section includes information such as the age, gender, marital status, level of education, length of service in the profession, and the title in which the individuals responding to the survey are included.

In-Service Training Scale: In order to evaluate the training provided in the institution, the in-service training scale developed together with Örücü and Kanbur was used. The scale includes 11 items. It includes questions that will evaluate the frequency at which the training activities provided in the institution are carried out and to what extent they affect the efficiency and motivation of the personnel. The scope of the scale is formed by the support of individuals for the training to be given in the institution and the opinions of nurses and doctors on the necessity of the training. 5 codes were determined on a 5-point Likert-type scale. These are: 1 strongly disagree, 2 disagree, 3 undecided, 4 agree, 5 strongly agree.

TQM-Total Quality Management Scale: In 1996, Al-Assaf and Steven Gentling conducted a study among high-level administrators working in some healthcare institutions in the USA regarding the TQM scale. This study evaluated perceptions and attitudes towards TQM. The survey has validity and reliability. In 2004, Songül Doğan translated it into Turkish, updated it and included it in her study. 5 codes were determined on a 5-point Likert-type scale. These are: 1 strongly disagree, 2 disagree, 3 undecided, 4 agree, 5 strongly agree.

Statistical Techniques Used in Data Analysis

The survey responses of 350 participants were analyzed using SPSS for Windows 25.00 and AMOS 25.0 programs. In the frequency analysis of the sample, demographic characteristics and descriptive information about working life were given together with percentage rates. Confirmatory factor analyses of the In-service training (HIE) scale and Total quality management (TQM) scales included in the survey form were conducted and the consistency, validity and reliability in the sample were measured by calculating Cronbach's alpha, Composite reliability and Average Variance Explained (AVE) values. Discriminant validity analysis was conducted between the variables and it was investigated whether the separation between the variables was sufficient for structural equation modeling. The mediation effect of In-service training on the effect of education, age and working years variables on the perspective on Total Quality Management was tested using the path analysis model and bootstrap method (n=5000).

In the study, which included a total of 350 participants, the average age of the participants was calculated as 33.45 ±1.23.

Table 1. Demographic Characteristics of The Sample

		n	%
Gender	Female	193	55,1%
	Male	157	44,9%
Marial status	Married	185	52,9%
	Single	165	47,1%
Age groups	18-24	74	21,1%
	25-34	106	30,3%
	35-44	97	27,7%
	45-54	46	13,1%
	55 and over	27	7,7%
Educational status	High school	19	5,4%
	Ön lisans	28	8,0%

	Lisans	99	28,3%
	Tıp fakültesi	141	40,3%
	Yüksek lisans/doktora	63	18,0%

There is a balanced distribution of participants' gender, with 55.1% female and 44.9% male. 52.9% of our participants are married, while 47.1% are single. In the age groups, the 18-24 group is 21.1%, the 25-34 group is 30.3%, the 35-44 group is 27.7%, the 45-54 group is 13.1% and the 55 and over group is 7.7%. The participants' educational backgrounds are represented in the sample as high school 5.4%, associate degree 8.0%, undergraduate 28.3%, medical 40.3%, master's and doctorate 18%.

Table 2. Distribution of participants' title and working year groups

		n	%
Title	Nurse/Midwife	179	51,1%
	Doctor	171	48,9%
Working year groups	<1 year	61	17,4%
	2-5 year	93	26,6%
	6-10 year	105	30,0%
	11-15 year	46	13,1%
	16 year and over	45	12,9%

51.1% of the participants are nurses/midwives, while 48.9% are doctors. While 17.4% of the participants have 1 year or less of work experience, 26.6% have 2-5 years, 30.0% have 6-10 years, 13.1% have 11-15 years, and 12.9% have 16 years or more of experience.

Confirmatory Factor Analyses of the Scales in the Model

In the Confirmatory Factor Analysis, as the sample size increases, especially in samples larger than 200, the Chi-Square (x2) value also becomes high, and the statistical significance level of the Chi-Square (x2) test becomes low. In the confirmatory factor analysis evaluation of the scales used for the research and the suitability of the generally tested models, the Chi-Square (x2) value corrected with the degree of freedom (Chi-Square value/Degree of freedom), other goodness of fit indices and the values in the standardized residual covariance matrix were decided as a result of the examination.

Table 3. Goodness of Fit Indices and Fit Values Used in Confirmatory Factor Analysis

Indexes Good Fit Acceptable Fit	Indexes Good Fit Acceptable Fit	Indexes Good Fit Acceptable Fit	SIE	TQM
x^2 / df	$0 \leq \chi 2/df \leq 2$	$2 < \chi 2/df \leq 3$	2,616	2,190
GFI	≥ 0,90	0,85-0,89	,914	,911
CFI	≥ 0,97	≥ 0,95	,963	,958
SRMR	≤0,05	,06 ≤ SRMR ≤ ,08	,065	,056
RMSEA	≤ 0,05	,06 ≤ RMSEA ≤ ,08	,074	,063

Confirmatory factor analysis for In-Service Education Scale (HIE)

In the confirmatory factor analysis applied to the In-Service Education Scale with 11 items and one dimension in the literature, since the factor loadings were found for all 11 items (FY>0.50), no items were eliminated from the analysis. The confirmatory factor analysis was concluded with 11 items as in the literature. In the analysis, the factor loading standard values are in the range of (.59;.93). According to the model indices in Table 3, the Digital Transformation Scale is within the limits of "acceptable fit".

Confirmatory Factor Analysis for Total Quality Management Scale (TQM)

In the confirmatory factor analysis applied to the Total Quality Management Scale (TQM) with 27 items and 5 dimensions in the literature, since all the items are (FY>0.5), no items were eliminated from the analysis. In the analysis, it is seen that the factor loading standard values are in the range of (.54;.91). According to the model indices in Table 3, Total Quality Management is within the limits of "acceptable fit".

Convergent and Discriminant Validity applied to the variables in the model

Combined reliability (CR) values are calculated from the factor loadings calculated from the confirmatory factor analysis. When the combined reliability value is (CR≥0.70), it can be said that the combined reliability condition is met.

The indicator of convergent validity is the average variance explained (AVE) value. In order to confirm convergent validity, it is sufficient for the average variance explained (AVE≥0.50). If the entire combined reliability value (CR≥0.70) is found, it is also sufficient for it to be (AVE≥0.40). In order to ensure discriminant validity, the square root result (√AVE) of the average variance explained (AVE) value must be higher than the correlation values in the same row and column.

Table 4. Convergent and Discriminant Validity Values Calculated from Standard Factor Loadings

Dimension	AO	SS	HIE	SY	SRD	YE	STD	PYB
HIE	2,83	,59	(,781)					
SY	3,53	,81	,238**	(,788)				
SRD	3,59	,81	,188**	,609**	(,801)			
YE	3,26	,86	,211**	,601**	,680**	(,718)		
STD	3,38	,94	,133*	,560**	,654**	,625**	(,714)	
PYB	3,64	,87	,130*	,583**	,659**	,551**	,616**	(,741)
Cronbach's Alpha (CA)			,808	,811	,878	,841	,809	,819
Composite reliability (CR)			,802	,809	,823	,821	,805	,813
Average Variance Explained (AVE)			,611	,621	,642	,516	,510	,550

****p<0.001 **p<0.01 *p<0.05*

The reliability values of the scales in the study in the sample are; Since it was found for the in-service training scale (.808) and for the Total Quality Management scale (.890), it is

understood that there is a "high reliability level" for both scales. In the sub-dimensions of the Total Quality Management scale, since it was found for Process management (.811), Sustainability (.878), Manager training (.841), Standardization (.809) and Stakeholder awareness (.819), high reliability (Alpha≥0.80) was obtained for all sub-dimensions. Composite reliability was found for the In-service training scale (.802), for the Total quality management scale (.856). In the sub-dimensions of the Total quality management scale, it was found for Process management (.809), Sustainability (.823), Manager training (.821), Standardization (.805) and Stakeholder awareness (.813). Since the coefficient calculated for all scales and sub-dimensions in the composite reliability values is (CR≥0.70), it is understood that the composite reliability condition is met. It can be stated that it is provided. Since the average explained variance values for all variables are calculated as (AVE≥0.50), the necessary condition for convergent validity is provided. The square root values of the average explained variance (AVE) results calculated for discriminant validity are given in parentheses. Since these results are higher than the correlation coefficients in the same row and column, it can be stated that the condition for discriminant validity is also met.

Structural Equation Modeling Path Analysis of the Research Model

Models that test the existence of mediator or moderator variables in various aspects form the basis of structural equation modeling. Models that test the existence of mediator or moderator variables in one aspect can be considered as simple structural equation models. The research model shown in Figure 5 was tested using path analysis via the AMOS program version 25.0. Whether the indirect effects in the model are statistically significant or not, since they mostly do not meet the normal distribution assumption, has been tested with the bootstrapping method, which has been suggested instead of the Sobel test in recent years, by simulation (using at least 5000 resamples for a 95% Confidence Interval (CI) (Preacher and Hayes 2004, 2008).

In the research model, it was examined whether the In-Service Training variable has a mediating role in the effect of the age, education and working years variables on the Total Quality Management variable.

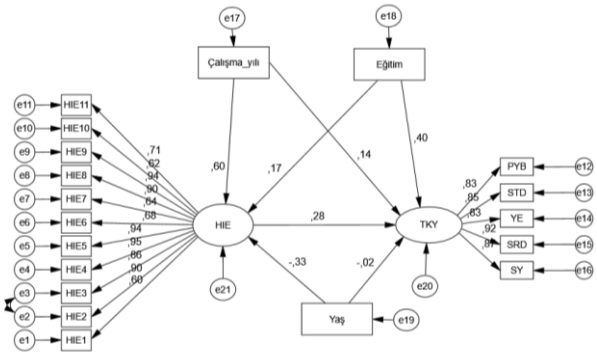


Figure 1. Figure 1. Mediator model path analysis with observed variables (bootstrap n=5000)

Since the model test values (p<0.05) in the path analysis model with observed variables are x2 (335.965), x2/df (2.317), it is understood that the model is significant. Since the fit index values of the model GFI (.912), CFI (.961), SRMR (.0759), RMSEA (.0760) are within the acceptable fit limits, it is understood that the model is valid. Detailed values regarding the model regression parameters (Table 9) and mediator hypotheses are given in the table (Table 10).

Table 5. Significance test of the regression coefficients in the model

Independent		Dependent	Coefficient	Constant coefficient	Z	P	Hypotesis
Working_years	→	HIE	,328	,596	7,734	P<0,001	Accept
Education	→	HIE	,111	,171	3,155	P<0,01	Accept
Age	→	HIE	-,193	-,333	-5,481	P<0,001	Accept
Education	→	TKY	,281	,404	6,273	P<0,001	Accept
HIE	→	TKY	,305	,284	3,092	P<0,01	Accept
Working_years	→	TKY	,082	,138	1,739	P>0,05	Reject
Age	→	TKY	-,010	-,016	-,235	P>0,05	Reject

HIE In-service training TQM: Total quality management

In Table 5, where the direct regression effects are examined in the path analysis model with the observed variables, the effect of the working year on In-service training, the effect of the education level on In-service training, the effect of the age on In-service training, the effect of the education level on the Total quality management score, the effect of In-service training on the Total quality management score (p<0.05) are found to be significant. The effect of the working year on the Total quality management score and the effect of the age on the Total quality management score are found to be statistically insignificant (P>0.05). Accordingly;

• The effect of the working year variable on the In-service training variable (β=,3596;p<0.05) was found to be positive and significant. Accordingly, the increase in the working year directly causes the in-service training score to increase.

• The effect of the education level on the In-service training variable (β=,171;p<0.05) was found to be positive and

significant. Accordingly, it can be said that the increase in the education level will directly cause the in-service training score to increase.

• The effect of the age variable on the In-service training variable (β=-,333; p<0.05) was found to be negative and significant. Accordingly, an increase in the age variable directly causes a decrease in the In-service Training score.

• The effect of the education level variable on the Total Quality Management score (β=,404; p<0.05) was found to be positive and significant. Accordingly, an increase in the education level directly increases the Total Quality Management score.

• The effect of the in-service training score variable on the Total Quality Management score (β=,284; p<0.05) was found to be positive and significant. Accordingly, an increase in the education level directly increases the Total Quality Management score.

• The effect of the working year variable on the Total Quality Management score (β=,138; p>0.05) was found to be insignificant. Accordingly, the change in the working year does not directly affect the Total Quality Management score.

• The effect of the age variable on the Total Quality Management score (β=-,016; p>0.05) was found to be insignificant. Accordingly, the change in the age variable does not directly affect the Total Quality Management score.

Table 6. Significance test of the mediator hypotheses in the model

	Direct effect	p	Indirect effect	P	Hypotheses
Work year→HIE→TKY	**,082**	P>0,05	**,169****	P<0,01	**Accept**
Education →HIE→TKY	,281**	P<0,001	,049*	P<0,05	Reject
Age→HIE→TKY	**-,010**	P>0,05	**-,095***	P<0,05	**Accept**

**p<0.01 *p<0.05

The bootstrap method (n=5000) was used to investigate the mediating role of the In-service training variable in the effect of the variable of working year, education level and age on the Total quality management score. Two of the 3 mediation hypotheses in the model were accepted as full mediators and one as partial mediators.

• The indirect effect of the variable of working year on the Total quality management score via the In-service training variable (β=,169;p<0.05) was found positive and significant. Accordingly, the variable of In-service training acts as a full mediator in the effect of the working year on the Total quality management score. Accordingly, as the working years of the employees increase, continuing to provide in-service training ensures that their thoughts on Total quality management increase positively.

• The indirect effect of the variable of education level on the Total quality management score via the In-service training variable (β=,049;p<0.05) was found positive and significant. Accordingly, the variable of In-service training acts as a partial mediator in the effect of the level of education on the Total quality management score. Accordingly, as the education level of the employees increases, continuing to provide in-service training will increase the thoughts on total quality management in a positive sense.

• The indirect effect of the age variable on the Total quality management score via the In-service training variable (β=-.095; p<0.05) was found to be negative and significant. Accordingly, the In-service training variable fully mediates the effect of age on the Total quality management score. Accordingly, as the ages of the employees increase, continuing to provide in-service training will increase the thoughts on total quality management in a negative sense.

In order to ensure the sustainability of the thoughts on Total quality management in institutions, it would be more appropriate for In-service training to focus on educated personnel and personnel with more years of service. Similarly, it is important for the sustainability of TQM practices to select the people who will serve as Total quality management personnel by taking these criteria into consideration. It is noteworthy that the age of the personnel creates a negative situation due to the indirect effect of receiving in-service training in a way that decreases the Total quality score. In this case, the necessity of inviting older personnel to In-service training should be questioned. Again, with the same logic, the assignment of older personnel as TQM personnel, which necessitates in-service training, shows that these personnel will be inadequate in TQM processes. According to this model, it is important to increase the thoughts on TQM in a positive way and to select more educated personnel in the selection of TQM personnel, and to pay attention to the fact that they have more years of work but are younger in age.

4. Conclusion & Recommendations

This study aimed to examine how doctors and nurses working in Istanbul evaluate in-service training programs in terms of Total Quality Management (TQM), and to determine whether demographic variables influence their perceptions. The findings revealed that healthcare professionals generally have a positive perception of TQM. While a majority of participants (72%) found in-service training programs effective, 40.5% stated that they had not received any training related to TQM, indicating a gap in the dissemination of quality-related training.

Demographic variables such as age, gender, marital status, and education level were found to have both direct and indirect effects on perceptions of TQM. Participants with higher educational attainment showed more favorable attitudes toward TQM, and younger or middle-aged professionals were more receptive to training content. Moreover, in-service training was found to play a mediating role by reducing perceptual differences caused by demographic diversity, thereby supporting more consistent quality awareness across the workforce.

Comparisons with similar or closely related studies highlight the relevance and contribution of the present research. For example, Aljasmi et al. (2023) conducted a study in UAE hospitals and found that hospital-level demographic factors, such as size, government versus private status, accreditation, and technology use, significantly influenced TQM implementation. While their study focused on institutional demographics, it parallels our finding that demographic characteristics affect perceptions of TQM; however, our study adds value by examining individual-level factors such as age, gender, and education, and their interplay with in-service training. Similarly, Atalıç and Çiçek (Turkey) explored healthcare providers' perceptions of TQM practices in a public hospital and found that attitudes differed among nurses, physicians, and administrative staff regarding leadership, patient satisfaction, quality management processes, and measurement. This aligns with our results that demographic variables, which may reflect role differences, influence TQM perceptions, yet unlike their study, we emphasise the mediating role of in-service training in shaping these perceptions. A cross-sectional study on 132 nurses examining quality management and performance found that higher education levels correlated positively with job performance and commitment, whereas attendance of a TQM course did not significantly affect outcomes. This contrasts with our finding that training mediates perception differences, suggesting that contextual factors, training quality, or content may account for the observed effect. Dagasan, Kitapci, and Kilic (2023) reported that nurses' perceptions of TQM principles positively influenced job performance, with relationships moderated by locus of control. Although our study does not examine locus of control, it similarly underscores the importance of perceptions, while our focus on demographic differences and training extends understanding of factors shaping these perceptions. Furthermore, a quasi-experimental study in Turkey demonstrated that a training programme improved nurses' perceptions of caring culture, which correlated with higher job satisfaction and reduced intention to leave, supporting our finding that training can shift perceptions and potentially influence attitudes or behaviours. Finally, an Egyptian study on training and developmental practices in hospitals highlighted that different roles received varying levels of quality training, which affected TQM application. This resonates with our finding that 40.5% of participants had not received TQM-related training and that in-service training plays a mediating role, reinforcing the broader literature emphasizing the importance of training for quality management awareness and implementation.

Recommendations

- **Update Training Content to Focus on TQM:** In-service training programs should be restructured to align with TQM principles, including topics such as quality processes, patient safety, and continuous improvement.
- **Develop Demographic-Sensitive Training Models:** Training formats should be adapted to suit the diverse needs of staff based on age, education level, and learning preferences, offering options such as face-to-face, online, and hands-on modules.
- **Expand TQM Training Accessibility:** Special programs should be developed for staff who have not previously received TQM training, and these programs should be integrated into institutional policies and quality strategies.
- **Ensure Continuity and Evaluation of Training:** In-service training should be delivered regularly rather than sporadically, and its effectiveness should be assessed through post-training evaluations and feedback mechanisms.
- **Encourage Staff Participation in Quality Practices:** Institutions should promote active employee involvement in TQM processes through tools like suggestion systems and quality circles, creating a participatory and quality-focused work environment.

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