



# Analyzing the ambiguous relationship between efficiency, quality and patient satisfaction in healthcare services: The case of public hospitals in Turkey



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## ARTICLE INFO

### Article history:

Received 9 April 2012  
Received in revised form 14 May 2013  
Accepted 16 May 2013

### Keywords:

Hospital efficiency  
Structural quality  
Patient satisfaction  
Data envelopment analysis

## ABSTRACT

**Objective:** This paper empirically analyzes the effects of efficiency and structural quality on patient satisfaction in Turkish public hospitals. It also investigates the controversial relationship between hospital efficiency and structural quality for small, medium and large size hospitals in a comparative perspective.

**Methods:** Data envelopment analysis (DEA) is used to analyze the efficiencies of hospitals. Data concerning 523 public hospitals is obtained from Turkish Ministry of Health. Due to the missing data of some hospitals, the sample of this study is composed of the remaining 348 observations. Multiple regression analysis is used to evaluate the relationship between patient satisfaction as a dependent variable and structural quality, hospital efficiency and institutional factors as independent variables. Furthermore, stepwise process multiple regression analysis is used to analyze the moderator effects of hospital efficiency on the form of the relationship between quality and satisfaction.

**Findings:** The findings indicate that hospital efficiency changes the form of the relationship between structural quality and patient satisfaction as a moderator variable. The trade-off between quality and efficiency is found to vary depending on the hospital size. Negative correlation is found between quality and efficiency for small-size hospitals. However, positive correlation between efficiency and quality is found significant as indicated by Total Quality Management (TQM) approach for large-size hospitals. This study also provides the empirical evidence on the negative relationship between patient satisfaction and hospital size.

**Conclusions:** The effect of hospital efficiency on patient satisfaction might be improved for inefficient small and medium size hospitals by taking successful large hospitals as role models.

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## 1. Introduction

The rising trends of healthcare costs and rapidly increasing demands have forced healthcare providers to focus more on productivity and quality [1]. Besides, the effective utilization of limited resources has become an imperative problem for hospital management. Therefore, health institutions are predictably under pressure to develop their operations both in terms of resources they use and in terms of quantity and quality of their outcomes [2].

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The paucity of healthcare resources is especially problematic in developing countries where poor health condition is one of the most important limitations for economic development and welfare [1]. Thus, hospitals of developing countries should focus on the effective utilization of resources and increasing quality in their operational efforts. Recent research indicates that maximizing efficiency and quality in hospitals has become an essential dynamic for hospital administrators [3].

Efficiency is defined as the usage of input resources in such a way that there is no waste, while outputs are maximized for quality and production [4]. Kirigia et al. [5] state that efficiency means providing maximum services out of obtainable resources or minimizing the use of available resources to produce a given level of services in the context of hospitals. Although efficiency cannot be considered as the only final outcome of a healthcare organization, improvements in this aspect could provide enhancements in other institutional goals [6] such as quality of care.

Quality of care can be defined as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” [7]. In fact, the definition of “quality of care” becomes simple or complex, depending on how we define the concept of “quality”. At this point, Donabedian [8] classified the quality of care under three categories such as structure, process and outcomes. (i) *Structural quality* indicates the feature of the setting in the care process. It covers the specification of the material resources, human resources and organizational structure. (ii) *Process quality* indicates what is actually done in the care process. It covers both physicians and patient activities in the treatment process. (iii) *Outcome quality* indicates the effects and results of care from the patients’ perspective. It covers the improvement on patients’ knowledge, valuable changes in patients’ behavior and the patients’ satisfaction on the care process [8]. In this study, we do not adduce to evaluate the quality level of the “whole” care process. We aim to assess the “structural quality” of Turkish hospitals by using the available data called “Quality Index of Turkish Ministry of Health”.

Indeed, examining only the efficiencies of hospitals or interaction between efficiency and quality is just a part of the puzzle of assessing health services. A more appropriate evaluation should include the patient satisfaction perspective. Therefore, they should be examined simultaneously to better understand the controversial relationship between these variables. Yet, to the best of our knowledge, there exist no study incorporating quality measures into the efficiency models while also analyzing their effects on patient satisfaction.

Therefore, the primary research questions guiding this study are as follows: (i) Is there any direct and/or indirect impact of hospital efficiency and structural quality on patient satisfaction? (ii) What kind of a relationship exists between structural quality and hospital efficiency? In light of these questions, this study aims to contribute to the existing literature by investigating the relationships between hospital efficiency and quality as well as their impact on patient satisfaction. Accordingly, the proposed research model in this study is presented in Fig. 1.

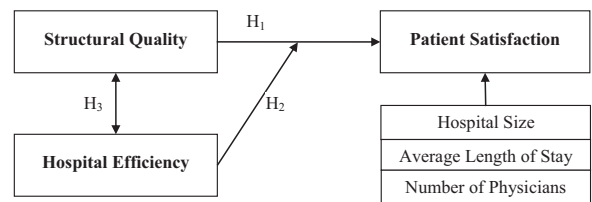


Fig. 1. The proposed model of the study.

In this model we examine three primary hypotheses as follows:

**Hypothesis 1.** Structural quality has a positive effect on patient satisfaction.

**Hypothesis 2.** Hospital efficiency changes the form of the relationship between structural quality and patient satisfaction as a moderator variable.

**Hypothesis 3.** Hospital efficiency is correlated with structural quality.

Furthermore, some previous studies suggest that institutional factors – such as hospital size, teaching activity, and rural location etc. – might influence patient satisfaction [9]. Although structural quality and patient satisfaction is the primary focus of this study, hospital size, average length of stay and number of physicians are also included in the regression model.

Consequently, the study posited the following model:

Patient satisfaction =  $f(\text{structural quality, hospital efficiency, hospital size, average length of stay, number of physicians})$

Patient satisfaction is hypothesized to be negatively correlated with hospital size, average length of stay, and positively correlated with the number of physicians.

The remainder of paper is organized as follows. Section 2 begins with brief information about Turkish Health Care System and recent reforms such as Health Transformation Program (HTP). Section 3 describes the research design including data sources and methodology. This section also presents a brief description of the DEA model along with the inputs and outputs used in this study. Structural quality and patient satisfaction indexes are identified in this section. Section 4 introduces the analysis and empirical results. Discussions of empirical results are presented in the Section 5. Finally, Section 6 draws conclusions, constraints of the current study and finalizes with policy implications and suggestions for future research.

## 2. Recent reforms in Turkish health care system

Turkish health care sector has been experiencing a tremendous transformation in the last decade. In 2003, a new initiative called “Health Transformation Program (HTP)” was launched by Turkish government in order to transform Turkish health care system to bring into line with the current trends in world health care system. Thus a new era of reforms has been put into practice to improve

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