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Article

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Measuring the quality of health services provided at a Greek Public Hospital through patient satisfaction. Case Study: The General Hospital of Kavala

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ARTICLE INFO	ABSTRACT
<p>Article History Received 15 February 2017; Accepted 20 May 2017 <i>JEL Classifications</i></p>	<p>Purpose: The aim of this study is to examine the quality of hospital services as perceived by patients in terms of patient satisfaction with services.</p> <p>Design/Methodology/Approach: A conceptual framework of quality of hospital services, developed by Padma et al. (2009), composed by eight quality dimensions, applied the performance measurement model (SERVPERF), was used for the approach. The Quality Score Tool was a two-part questionnaire that quantified patient satisfaction with benchmarks of the quality dimensions. In order to investigate the above model, the case study method was utilized. The survey was conducted in a public regional hospital.</p> <p>Findings: Five (5) quality dimensions (5Qs) have found having a significant impact on overall quality of service, measure of patient satisfaction in the hospital. These dimensions are on a hierarchical scale: "clinical care", "social responsibility", "staff quality", "infrastructure" and "Hospital reliability".</p> <p>Originality/Value: The results of this study can be used as a source of feedback to hospital management, meaning that they can essentially lead to improved adjustments or serve as a basis of process reengineering.</p>
<p>Keywords: Hospital services, quality dimensions, patients satisfaction, hospital, SERVPERF</p>	

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1. Introduction

Health is established in the Greek Constitution as a social right. All individuals are entitled to health and genetic identity protection (according to Article 5.5). The state takes care of citizens' health and adopts specific measures to protect the youth, those that are old of age, the disables and care for the most deprived (see Article 21.3).

According to the World Health Organization (1993), "quality in health services is the provision of diagnostic and therapeutic measures capable of ensuring the best possible health outcome, within the scope of modern medical science, which should aim at the best possible results with minimal medical risk, as well as maximum patient satisfaction in terms of procedures, results and human contact." Article 47 of Law 2071/1992 on the modernization and organization of the health system, as amended, provides for the protection of a series of rights for hospital patients. Greece has also signed and sanctioned a Convention with the Council of Europe on the protection of human rights and the dignity of human

existence in relation to the uses of biology and medicine (Garanis-Papadatos and Dalla-Vorgia, 2003).

The aging of the population, as well as the constant increase in life expectancy, undoubtedly leads to major healthcare needs. Many countries are confronted with the fact that their most rapidly growing demographic age group is over 80, as the trend of life expectancy seen in the last century is expected to continue. According to OECD data, life expectancy in Greece in 2011 is 80.8 years, i.e. 0.8 percentage points higher than the OECD average.

The Greek economy was going through the seventh consecutive year of recession in 2014. Total health expenditure fell by 2.0% in 2011 compared to 2010 and by 12.6% in 2012, compared to 2011, according to Hellenic Statistical Authority (HSA) data. Public spending on hospitals and nursing care facilities has fallen sharply in 2010 compared to 2009, while in the following years there are fluctuations with a stabilizing trend.

In most industrialized countries, performance measurement of public services has become a key issue as governments are under pressure to reduce tax and at the

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same time confirm that revenues are spent in a cost-effective way (Martin and Smith 2005).

Patients receive various medical care services and rightly judge the quality of the services provided to them (Choi et al., 2004).

The quality of health services is a major problem for both hospitals and patients. Their reported underfunding, coupled with patients' widespread perception of quality of service generally hinders the resolution of the problem.

In the context of health care, one way of overcoming gaps in service quality is to use the patient's views to improve the health care process (Zeithaml et al., 1990 and Duggirala et al., 2008). Furthermore, recognition of the importance of quality of service is imperative, not only to provide better services to patients (Itumalla et al., 2014), but also to ensure the initial viability of the hospital and then its sustainable competitive advantage.

Therefore, it is considered appropriate to study the quality of services based on the measurement of the satisfaction of end users - patients in every Greek hospital, in order to initially weigh the prevailing situation so that through feedback the necessary measures are taken to improve the quality of their provision.

2. Theoretical Background

2.1. Quality of health services

Most scholars use activities, operations or processes and interactions to refer to services (Solomon et al., 1985, Lovelock 1991, Zeithaml and Bitner 2003, Vargo and Lusch 2004b). According to Hill (1977), services can be defined as changes to a person's status or to something owned by the client.

Edvardsson (1997) defines service as part of the broadest concept of the product, as a product may consist of commodities, derivatives, or more commonly a combination of them. The customer is often involved as a co-producer while the service is created during the production process. Quality of service is usually defined as a customer's impression of the relative inferiority / superiority of a service provider and its acceptability range (Bitner and Hubert, 1994) and is often perceived as proportionate to the customer's overall attitude towards the provider (Parasuraman et al., 1988, Zeithaml 1988 and Bitner 1990).

In conclusion, perceived quality of service is interpreted as a consumer's judgment to reach the overall superiority of the product, based on the perception of what they received and what was provided (Zeithaml, 1988).

The researchers tried to understand the measurement of service quality and explain its relationship to the overall performance of businesses and organizations. A common denominator of research on service quality, since services are immaterial, heterogeneous and their "production" is inseparably linked to their "consumption", is that its subsequent assessment by customers becomes extremely complex and difficult to determine. The quality of healthcare is more difficult to identify than other services because it is the clients themselves and their quality of life that gets evaluated (Eiriz and Figueiredo, 2005).

The Health Care customer is the patient, who is the focus of its implementation system. Health, and in particular the relief or treatment of health problems, is a global issue as it is related to the imperative need to

provide high quality services, respectively, to medical developments and the desire of health professionals looking for clinical excellence (Sewell, 1997).

More specifically, Donabedian (1996) argued very early that the quality of care provided can be calculated based on patient satisfaction. Patient satisfaction is seen as one of the most important dimensions of service quality and a key success indicator in healthcare (Pakdil and Harwood, 2005). Similarly, according to Chilgren (2008), the definition of quality can simply be referred to as patient satisfaction.

For patients, "quality" means how well the service is provided and not if the actual service is technically superior. It can be considered as one of the desired outcomes of care and therefore information on patient satisfaction is required to assess the quality and planning of healthcare management (Turner and Pol 1995, Naidu 2009, Alrubaiee 2011). Ultimately, Gulas et al. (2014), conclude that, in healthcare units, the aim must be the culture of quality and continuous improvement with a reference point for the citizen.

2.2. Customer - patient satisfaction

There is ambiguity in the literature on the definition of the "customer". Sometimes the customer consists of a purchasing group of different people with different values and views. In the healthcare sector, Ovretveit (1992) proposed that it is a combination of patients, carers (e.g. relatives), counselors (e.g. doctor if they decide that a person needs a hospital service), and the financial authority. Each party has the needs and expectations that the service provider must understand and match when they are different. This of course is only possible if the service provider has a good relationship with all of them.

Milakovich (1995) states that for a healthcare provider, the patient and his / her family should be recognized as consumers in an extended definition of the client during the process where he / she receives the end products of the business. A thorough understanding of their needs and expectations is vital for the development of new products and services. Customer-orientation ensures more securely that the content of the service offered meets their needs and expectations.

The significance of the customer concept has shifted from the simple receiver of the service provided by a producer, to the one involved in creating value in the experience of the service (Bitner et al., 1997, Prahalad and Ramaswamy 2004). Traditionally, the patient has been described as a weak, exposed and person-dependent person considered to be a medical subject (Foucault, 1973).

However, according to the new visibility of the client's position, the position of the patient has shifted closer to that of the client, through market performance and management research over the last decades of the twentieth century (Nordgren, 2003, 2008). It is a process of transformation, whereby the patient becomes subject to the concept of the client, i.e. they acquire information, seek alternatives, move, make choices and participate in the production of value (Nordgren, 2009).

Typically, service quality is considered as a cognitive structure, while satisfaction is a more complex concept involving cognitive and emotional components. More specifically, satisfaction is believed to be a behavioral reaction associated with the perceptions of values that

patients have in contact with health providers (Kane et al., 1997).

Zineldin (2006) defines satisfaction as an emotional response. Although service quality and consumer satisfaction have specific common features, satisfaction is generally perceived as a wider concept, while service quality assessment focuses on the dimensions of the service (Zeithalm and Bitner, 2003). Patient satisfaction is defined as an assessment of a discrete dimension of health care (Linder-Pelz 1982, Hills and Kitchen 2007).

2.3 Dimensions of healthcare quality

A plethora of research in the literature exists on the number and content that constitutes the dimensions that define quality. The researchers, Tomes and Ng (1995) conducted content analysis and concluded that there are eight dimensions in total, such as empathy, understanding of the disease, relationship of mutual respect, nutrition, dignity of the hospitalized, natural environment and religious needs.

Camilleri and O'Callaghan (1998) argue that parameters such as professional and technical care, personalization of services, cost, environment, patient comfort, nutritional accessibility are the appropriate dimensions of hospital quality measurement. Andaleeb (1998), on the other hand, limits them to five dimensions, such as communication, cost, installation, competence, and behavior.

Zineldin (2006) claimed that there are five dimensions of technical, operational, infrastructure, interaction, and atmosphere quality. Choi et al. (2005) additionally support a structure of four factors, including the interest of the physician, the interest of the staff, the ease of the care process and the material elements, reflecting aspects of technical, functional, environmental and administrative quality.

Itumalla et al. (2014) argue that after the support services, the most important factors influencing the overall quality of the hospitalization services are nursing, administrative and medical services, as well as communication with the patient.

After a thorough study of the existing literature, it was considered that the dimensions that adequately describe the overall quality of hospital care are those supported by Padma et al. (2009, 2010), which are broken down as follows:

- a. **Infrastructure:** This includes the degree of cleanliness and comfort of the room, the degree of hospital overall safety, the level of availability of the required drugs at the right time, the level of availability of doctors and nurses, the level of availability of medical equipment and good working condition (Thompson 1983, Parasuraman et al., 1988, Reidenbach and Sandifer-Smallwood 1990, Tomes and Ng 1995, Camilleri and O'Callaghan 1998, Andaleeb 1998, Chowdhary and Prakash 2007, Walters and Jones 2001, Arasli et al., 2008, Zineldin 2006, Duggirala et al., 2008, Padma et al., 2010, Itumalla et al. 2014). The Joint Commission International - JCI (2007) has also added "facility management" as a core function in hospitals.
- b. **Personnel Quality:** This dimension addresses the patient's experience of communication and the kind of care provided by doctors, nurses, paramedics,

nursing staff, and hospital staff. It essentially falls under the quality of services and the human element of three of the four hospital services (Article 5, paragraph 1, No Y4a / house 122819/2012). Gronroos (1990) introduced a comprehensive list of six criteria for the proper understanding of service quality, such as professionalism and skills, attitudes and behavior, accessibility and flexibility, reliability and validity, recovery, reputation and solvency. Padma et al. (2010) argue in their research that staff quality is the main dimension that affects patient satisfaction. Itumalla et al. (2014) suggest in their research that after the support services, the most important factors affecting the overall quality of the hospitalization services are nursing, administrative and medical services, as well as communication with the patient.

- c. **Clinical care process:** A critical dimension of the quality of health care is the patient's experience of the different procedures that are part of his entire stay in the hospital. Many studies have been conducted on process management in the service sector. Lewis (1990) reported that the process is concerned with serving the distribution systems, the various physical characteristics associated with the organization and services provided, and the role of the employees of the organization (contact with the customer and the auxiliary staff) in the provision of quality service. Zeithaml et al. (1990) describe the process (within services) as the actual processes, mechanisms and flow of activities with which the service is provided, as well as the operating system. The management of the procedure examines the patient's perception of the treatment and the outcome of the treatment process (Duggirala et al., 2008). In their research, Padma et al. (2010) argue that the clinical care process is the second dimension that has the greatest impact on patient satisfaction.
- d. **Administrative procedures:** The administrative procedures when setting up a hospital include admission procedures during the hospital stay, as well as those involved in the patient's discharge and discharge phase. Curry and Sinclair (2002) report that patients will feel less affected by their treatment if access to the service improves. One of the important aspects of administrative procedures is the delay at the different stages of patient hospitalization. Service studies have shown that delays considered unreasonable or unnecessary for patients may lead them not only to dissatisfaction but also to anger. Based on the above, the patient's views on administrative services are an integral part of their understanding of the quality of health care services provided (Duggirala et al., 2008). More generally, the concept of a simple production as a quality-related value-creation process under the limitation of activities that add weight is considered appropriate (Klee and Westgard, 2015). Itumalla et al. (2014) suggest in their research that supportive services are the main factor affecting patient satisfaction.
- e. **Safety indicators:** They relate to the type of security measures a hospital has set up to protect patients physically and affect patients' perception of hospital quality. Massaro (2003) reported that healthcare leaders and their managers are required to guarantee

that patient safety is (and remains) one of the primary goals of the hospital. The moral imperative for patient safety is the basic philosophy of medical care, dating from ancient Greece and the Hippocratic Oath. Itumalla et al. (2014) found a statistically-significant impact of safety indices on patient satisfaction during their research.

- f. **Hospital image:** This dimension evaluates the patient's view of the overall medical experience they have received in the hospital. De Man et al. (2002) reported that active management of consumer perceptions about the quality of healthcare provided is important for many reasons. The study also shows the strong link between the perception of overall quality services and patient satisfaction. This overall image affects customer expectations when it is important for customers to have realistic expectations. More generally, in the healthcare sector, the reputation of the hospital must be seen as a key element of service quality (Padma et al., 2009, 2010).
- g. **Social responsibility:** An important contribution to the satisfaction of patients with regard to the quality of care provided by the hospital is whether the hospital fulfills its responsibility in society. This is manifested in relation to its role as mediator of social prosperity and development. This dimension satisfies the views of patients in relation to the social responsibility of the hospital. Wensing and Elwyn (2003) reported that it is a moral and legal rule that patients should be informed about and involved in their health care. The Malcolm Baldrige National Quality Award - MBNQA (2007) emphasizes that social responsibility is a vital indicator of quality of service. A service provider can not only be concerned about their profitability, but also about society as a whole.
- h. **Hospital reliability:** The hospital's reliability is measured by the sense of well-being felt by the patient in the hospital (safety, etc.) and affects the degree of the patient's confidence in the hospital. This in turn can cumulatively contribute to the overall assessment of the service provided (Padma et al., 2010). Iyer and Muncy (2004) consider that the patient's level of trust was governed by degrees of fluctuation in all patient categories and was apparently segmented to the service provider.

3. Tools

In the quality of services, various theoretical models enable management to identify quality problems, contributing greatly to the initial planning of an improved quality program with improved efficiency and effectiveness (Seth and Deshmukh, 2005). A conceptual model attempts to capture the relationships between the most important variables (Ghobadian et al., 1994) and is a simplified description of actual situations.

The basic service quality measurement models are:

- The technical and functional quality model (Gronroos, 1984), according to which an organization must understand the perception of consumers about the quality and the way in which this quality is affected,

in order to succeed in competition. Management of the perceived quality of services implies that the company should adapt to both expected and perceived services in order to achieve consumer satisfaction.

- The SERVQUAL model developed by Parasuraman et al. (1985), who argued that service quality is a function of gaps between consumer expectations and performance across quality dimensions.
- The SERVPERF model (Cronin and Taylor 1992), which measures business performance. Its name derives from "SERVICE PERFORMANCE".

In the form of equation, the quality of services according to SERVPERF is expressed as follows:

$$SQ_i = \sum_{j=1}^k P_{i,j}$$

Where:

SQ_i = perceived quality of services for i people

k = number of characteristics/issues

P = Person's i perception of the performance of the provisioning entity in relation to the characteristic j .

"SERVPERF" is a performance measurement of service quality with its symbolic representation in Figure 1 below.

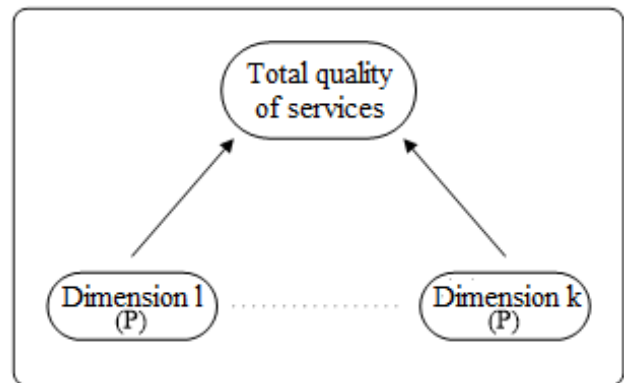


Figure 1: SERVPERF

Source : Martinez και Martinez, (2010)

3.1. Measuring service quality dimensions through the SERVPERF model

Several researchers suggested that service quality should be measured by taking only consumer perceptions into account rather than expectations minus perceptions (Carman, 1990, Cronin and Taylor, 1992, McDougall and Levesque 1994).

The purpose of this study is to measure the quality performance using the SERVPERF model. The reason why this model was chosen, although the SERVQUAL model has been widely used in health care units, is that,

according to Adil et al. (2013) measurement with SERVPERF is superior, not only in capturing the truly perceived quality of service, but also to halve the number of items to be measured. Furthermore, according to Martinez and Martinez, (2010), the performance measurement received a higher psychometric level of service quality assessment, in terms of structural validity and operational efficiency through performance data, and more precisely interpreted the overall measurement of the quality of provided services as measured by SERVQUAL

In the same context, research by Brady et al (2001), which supports the superiority of the Cronin and Taylor quality measurement performance approach and which is correctly modeled as a previous consumer satisfaction, is also included.

3.2. Conceptual framework of research.

The conceptual framework of quality of health services, based on the bibliographic review, is presented in the figure below using the performance measurement model (SERVPERF). In this context, the quality of health services in the various primary and secondary dimensions, i.e. infrastructure, quality of staff, clinical care process, administrative procedures, safety indicators, social responsibility, hospital image and hospital reliability, are described in the work of Padma et al. (2010).

Based on the above, the hypothesis under investigation is defined as H1, in which there is a significant effect of the dimensions of total quality (as perceived by patients) on patient satisfaction as illustrated in Figure 2 below:

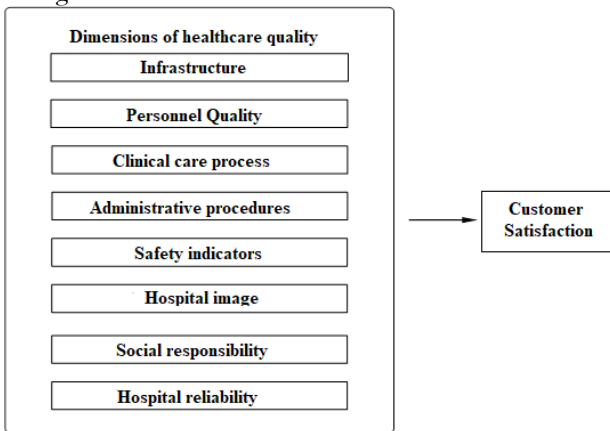


Figure 2: Conceptual model of customer satisfaction measurement in health services
Source: Padma *et al.* (2009)

4. Research methodology

The purpose of the present study is to balance the performance of the quality of hospital services as perceived by patients in terms of patient satisfaction with the services provided through the "SERVPERF" quality performance model and on the conceptual framework developed by Padma et al. (2009).

The Quality Score Tool was a questionnaire consisting of closed-ended questions that recorded the demographics of respondents and quantified their views

on the perceived quality of services provided to the hospital.

Initially the questionnaire was divided into a group of twenty patients who were recently hospitalized in order to check whether it is understandable and whether it responds to their opinion on the dimensions of perceived quality. The focal point was only patients, because the study aims to determine the dimensions of service quality and its assessment under the patient's understanding.

4.1 Description of the sample.

In the present case study case, hospital clients are defined as the hospitalized patients, who are considered the focal point of the research. A necessary and feasible condition for participation in the survey was that the respondents were patients who had been hospitalized in the last year in the above hospital. The method of randomized cross-sectional sampling was used. The desired sample was selected by the population of the prefectural hospital, since more than 80% of those hospitalized in the year 2013 came from it (GHK, 2014). The created layers by age were: younger than 18 years, 18-30 years old, 30-45 years old, 45-60 years old, older than 60 years old.

The formation of the sample presented several difficulties especially when determining the ratio of the layer to the population as well as the sample size. One way of selecting a sample size from market research companies is getting the equal the 0.2% of the actual population (Dimitriadis, 2012). Difficulty has been identified in identifying the actual population. If the actual population is considered to be the inhabitants of the prefecture, which amounted to one hundred and thirty-eight thousand, six hundred and eighty-seven inhabitants, the sample should consist of two hundred and seventy-seven (277) persons (138.687 inhabitants x 0.2%) The reasoning is that they are all potential patients, but this does not satisfy the defined condition. If the actual population is considered to be the total number of hospital admissions in the year 2013 of twenty-nine thousand nine hundred and twelve (29,912) hospitalized (GFC, 2014), the sample should consist of sixty people (60), which is too small.

Finally, the research followed the rationale of "five subjects per variable" (Hair et al., 2008 and Itumalla et al., 2014) to determine the total number of individuals of the desired sample. Since the research identifies forty-nine elements, the ideal size of the desired sample should be two hundred and forty-five (49 x 5 = 245).

Based on the above assumption it was difficult to determine the proportion of the layer. Finally, the ratio of the layers was formed on the grounds that the proportion of the elderly (64 years and older) of the Region of Eastern Macedonia and Thrace amounts to 20.5% of the population, that tends to grow (TEE of Thrace, 2013) and they are the more likely to become the Hospital's clients (already hospitalized or potential) along with those at forty-five (45) years or older since the older people are more likely to become hospital clients due to a health burden over time. In this context, it was considered appropriate for the sample to include a greater proportion of ages over forty-five, set at 60-65%.

The attributes of the actual sample obtained are depicted in the Table 1:

Table 1: Real demographic characteristics

Variable	Category	Frequency	Proportion (%) based on sample size (n=213)
Age	<18	4	1,9
	18-30	33	15,5
	30-45	31	14,6
	45-60	80	37,6
	>60	65	30,5
Gender	Male	82	38,5
	Female	131	61,5
Education level	Primary Education Graduate	37	17,4
	Graduate of Secondary Education	100	46,9
	Graduate of Higher Education	68	31,9
	Master of Science – PhD Title	5	2,3
Marital status	Married	155	72,8
	Unmarried	39	18,3
	Divorced	7	3,3
	Widower	12	5,6
Monthly Income	< 300€	8	3,8
	300-500€	27	12,7
	500-700€	43	20,2
	700-1000€	60	28,2
	<1000€	75	35,2
Profession	Public Employee	27	12,7
	Private Employee	77	36,2
	Freelance	34	16,0
	Retired	53	24,9
	Student	3	1,4
	Domestic Work	10	4,7
	Unemployed	9	4,2

4.2. Method of collecting data.

During the period between 15 September and 15 October 2014, two hundred and forty five questionnaires were distributed to residents of the county that had been admitted and treated in the hospital in the last year. Of these, two hundred and twenty-four (91% response) were returned, of which eleven were considered invalid because they did not answer all the questions. Therefore, the total valid sample is n = 213, which corresponds to 87% of the

ideal sample.

As a distribution area of the questionnaires, the premises of the hospital were excluded, given the emotional burden of hospitalized patients, associated with positive or negative instantaneous events or the disease that could temporarily affect their perception of quality, positively or negatively. As Oliver (1989) and Gazor et al. (2012) report, satisfaction is defined as a value, emotional response. Therefore, customers can evaluate the subject after interpreting it.

Distribution venues were determined based on matched layers by age group, combined with relevant interests by age. In the total valid sample, the proportion of age groups over forty-five is finally 69%. It exceeds our forecast by four percentage points. This is because there was a relative reluctance to complete questionnaires at younger ages. This finding is not considered to have a negative impact on the present investigation; most hospitals clients are expected to come from the above population group, which is therefore the target group.

4.3 Description of variable measurements.

The Quality Measurement Tool was a two-part questionnaire. The first part included the demographics of the respondents, the analysis of which gave rise to the actual features of the sample mentioned above.

The reliability of the questionnaire is taken for granted, as its elements / themes have been drawn from the recent rich literature. Specifically, they can be found in a number of scientific articles. For example, part of them is found in Zineldin (2006), much more extensive in Dugiralla et al. (2008), similar to Padma et al. (2010). Adaptation to Greek data was achieved through its evaluation by a target group of twenty patients before its final distribution to the final sample population as mentioned above in the introduction to this chapter.

In the first part of the questionnaire the demographics to be filled were age, gender, level of education, marital status, monthly income and occupation. They were measured using a different scale ranging between two points (e.g. gender) and seven points (e.g. a profession).

As reported by Naidu (2009), social and demographic variables show a positive correlation to patient satisfaction and include elements such as age, education, health status, race, marital status, and social order. Individual factors that are positively related to patient satisfaction are health status and education. Atinga et al. (2011), in their respective research, got information on gender, age, education and work.

In the second part of the questionnaire, the dimensions of quality were examined. The dependent variable on the overall measurement of patient satisfaction regarding the hospital services provided basically depicts and quantifies the performance of the overall quality of services based on the SERVPERF performance model. The performance of the overall quality of service is calculated by the contribution to the quality dimensions in terms of patient satisfaction, after first investigating the extent to which these dimensions affect the satisfaction of the patients of the hospital in question.

All subjects measuring the dimensions on the patient's side were recorded through the five points of the Likert scale. The scale ranges from 1 that corresponds to "none

/ insufficient / little" to 5 that corresponds to "very / very good" and was adopted adapted from Tucker and Adams' integrated patient satisfaction models (2001) Atinga et al., (2011). The scale used is as follows:

Disagree	Disagree	Moderate	Agree	Strongly Agree
1	2	3	4	5
Inadequate	Non-satisfaction	Moderate	Good enough	Very good

After the questionnaires were collected, the data was recorded in an excel sheet. The statistical analysis of the data was carried out through the SPSS statistical package, version 20. As a first step in this research, variables are considered questions that explore the dimension / factor. Initially, a frequency table was created for each variable, including the frequency, percentage, valid percent, and the cumulative percentage of the values of the variables to confirm the validity of the sample.

Exploratory factor analysis was then applied for each individual model factor. In each factor, Descriptive Statistics of its variables were performed. We calculated the mean, the standard deviation and the number of observations (N) for all its variables. A total of eight final factorial analyses were performed to investigate the type of relationship of their variables.

According to Hair et al., (2008), the primary purpose of factorial analysis is to determine the underlying structure between the variables by analyzing the structure of the interactions between all variables. Although the questionnaire was pre-existing, it was considered appropriate to investigate its structural reliability by predetermined factor-dimension. In this context, the Correlation Matrix was originally calculated by factor in order to show the correlations of all the pairs of variables (Dimitriadis, 2012). In the same table on the line Sig. (1-tailed) these correlations appear. If they are deemed significant at a materiality level of 0.05, there are conditions for further consideration of proficiency to perform a factorial analysis.

The Kaiser-Meyer-Olkin Index (KMO) was then considered as a measure of statistical sampling adequacy and shows the percentage of variability of variables that can be caused by underlying factors. This index ranges from 0 to 1, reaching 1 when each variable is predicted without error by the other variables. The CPM value must be greater than 0.50 for each individual variable. The value above 0.8 is considered statistically significant (Hair et al., 2008). In addition, Bartlett's Test of Sphericity was also examined. Since the Sig of this index per variable is less than 0.05, the assumption of no significant correlations at the 5% significance level (Dimitriadis, 2012) is rejected. A confidence analysis was then carried out with a measure of the Cronbach index. Indicator values range from 0 to 1. Values greater than 0.7 show satisfactory consistency and a credible factor (Dimitriadis, 2012).

Once the structural validity of each factor has been confirmed, in the second stage, the linear regression

model was tested. The ANOVA test was performed and the significance of the relationships between the variables and the significance of the model was evaluated through the F statistic. If the Sig of the statistical $F < 0.05$ the model variables are linearly correlated (Dimitriadis, 2012).

The VF (Variation Inflation Factor), which is a collinear diagnosis measure, was checked in the Coefficients panel. Values greater than two (> 2) are indicative of a collinearity problem. In addition, the Sig of the coefficients was checked in the t column and which determined which independent variables had a greater effect on the dependent variable. From these results and the coefficients of the Beta column, the equation of the particular model emerged (Dimitriadis, 2012).

5. Results

5.1 Verification of structural validity

In the initial factorial analysis of the factor Infrastructure, and in particular when calculating the correlation table in the sig (1-tailed) line, six of the seven variables were significant at a 0.05 level of significance. The variable "The level at which food served during hospitalization is fresh and healthy" had a value of $0.412 > 0.05$. In the subsequent statistical analysis, it is finally proved that it determined a further dimension as is depicted in Figure 3 and was subtracted from the investigated factor. Furthermore, it was not considered advisable to create another factor with a single variable.

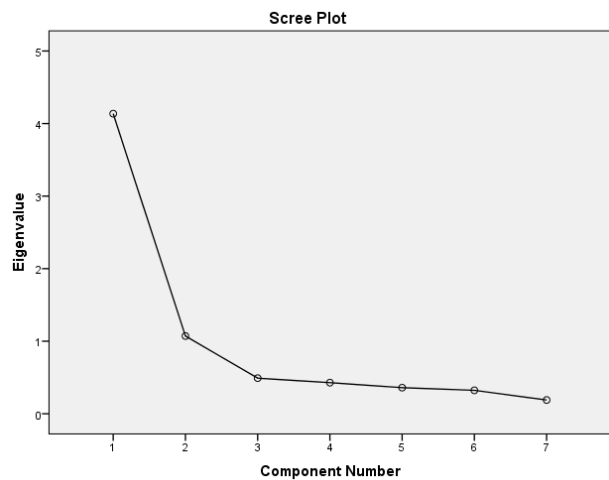


Figure 3: "Infrastructure" Factor (before removing a variable)

A factorial analysis followed again. The KMO of the factor was found to be 0.888, i.e. it is statistically significant and if the KMO sig is 0.000 (less than 0.05), the assumption of no significant correlations at the 5% significance level is rejected. Cronbach's has a value of 0.915 which is greater than 0.7. Based on the above and in addition to a thorough analysis, it appears that the factor is reliable and has good consistency (Figure 4).

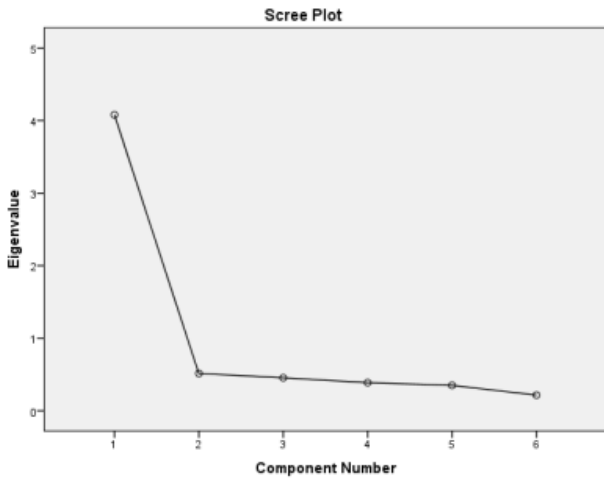


Figure 4: "Infrastructure" Factor (after removing a variable)

Here follows the factorial analysis of the second factor, "Quality of staff". Data analysis shows that the sig (1-tailed) line and the twelve variables are significant at a significance level of 0.05. The KMO of the factor was found to be 0.944, i.e. statistically significant and since the KMO sig is 0.000 (<0.05), the assumption of no significant correlations at the 5% significance level is rejected. Cronbach's has a value of 0.966 that is greater than 0.7. Therefore, the factor is credible and has good consistency. In the following graph, the eigenvalue is greater than one (Figure 5):

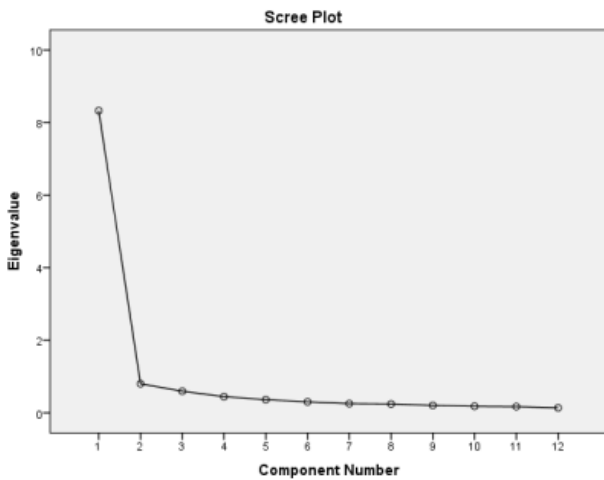


Figure 5: "Quality of Staff" Factor

In the factorial analysis of the third factor, "Clinical care process", it is noted that in the sig (1-tailed) line, the six variables are significant to significance level of 0.05. The KMO of the factor was found to be 0.922, i.e. statistically significant and since the KMO sig is 0.000 (less than 0.05); the assumption of no significant correlations at the 5% significance level is rejected. Cronbach's has a value of 0.964 that is greater than 0.7. Therefore, the factor is credible and has good consistency. In the following graph, the eigenvalue is greater than one (Figure 6)

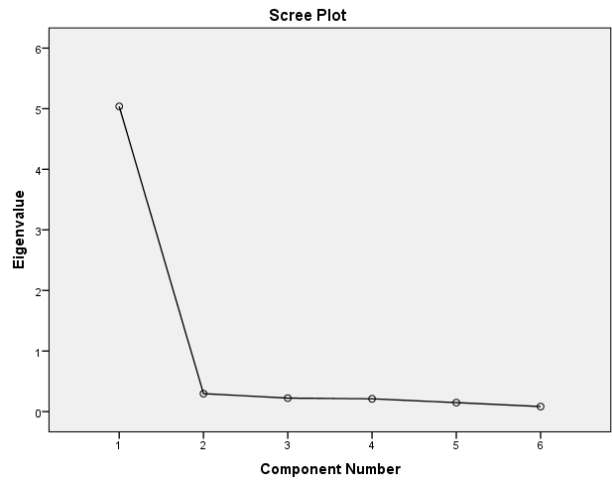


Figure 6: "Clinical Care Process" Factor

In the factorial analysis of the fourth factor, "Administrative Procedure" it is found that in the sig (1-tailed) line and the eleven variables are significant at a significance level of 0.05. The KMO of the factor was found to be 0.918, i.e. statistically significant and since the KMO sig is 0.000 (less than 0.05); the assumption of no significant correlations at the 5% significance level is rejected. Cronbach's has a value of 0.948 that is greater than 0.7. Therefore, the factor is credible and has good consistency. In the following graph, the eigenvalue is greater than one (Figure 7):

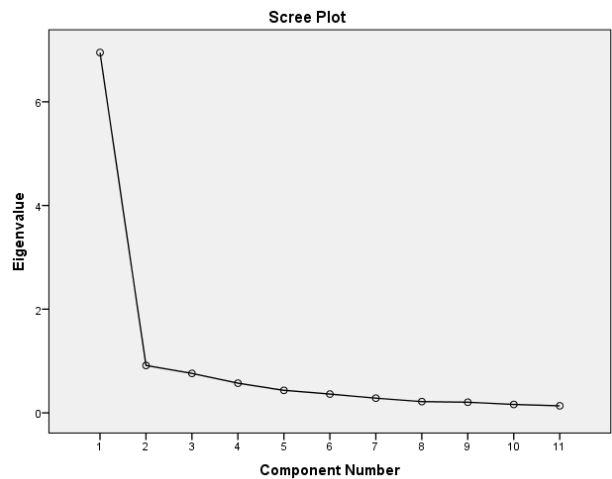


Figure 7: "Administrative Procedure" Factor

In the Factorial Analysis of the Fifth Factor, "Safety Indicators", it is noted that in the sig (1-tailed) line the three variables are significant at a significance level of 0.05. The KMO of the agent was found to be 0.710 (<0.8), i.e. marginally statistically significant given that the KMO sig is 0.000 (less than 0.05). Cronbach's has a value of 0.846 that is greater than 0.7. Therefore, we consider that the factor is reliable with satisfactory consistency. In the following graph, the eigenvalue is greater than 1 (Figure 8):

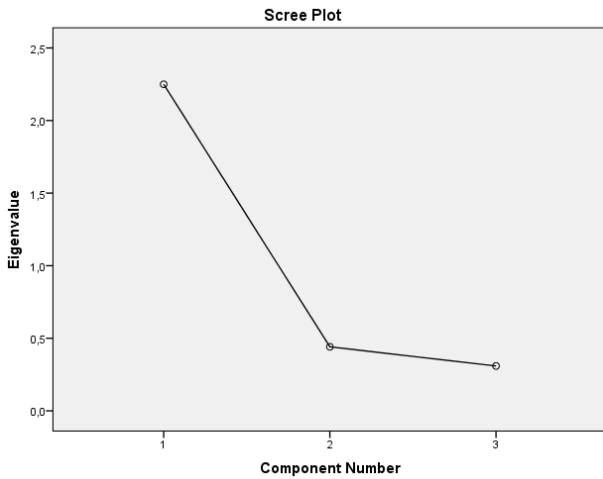


Figure 8: "Safety Indicators" Factor

In the factorial analysis of the sixth factor, "Hospital image", it is found that in the sig (1-tailed) line all three variables are significant at a significance level of 0.05. The factor KMO was found at 0.583, which is slightly above the limit of 0.5. Since the KMO sig is 0.000 (less than 0.05) remains for further investigation, given that Cronbach's has a value of 0.771 (> 0.7). In the following graph, the eigenvalue is greater than 1 (Figure 9):

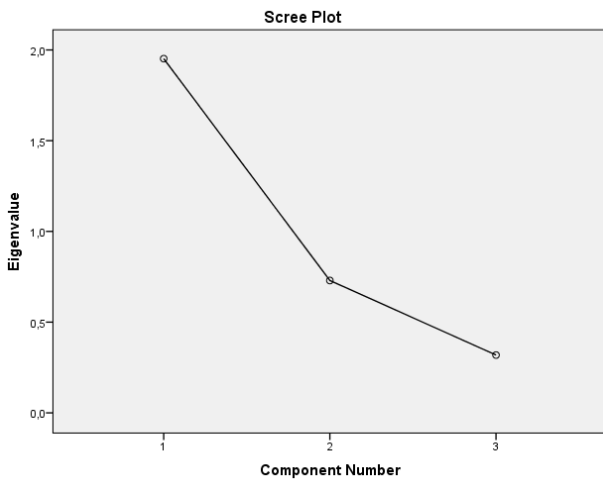


Figure 9: "Hospital Image" Factor

In the factorial analysis of the seventh factor, "Social Responsibility", we find that in the sig (1-tailed) line all three variables are significant at a significance level of 0.05. The factor KMO was found to be 0.500. With the same reasoning mentioned above remains for further investigation, since the KMO sig is 0.000 (less than 0.05), even though Cronbach's has a value of 0.905 (> 0.7). In the following graph, the eigenvalue is greater than one (Figure 10):

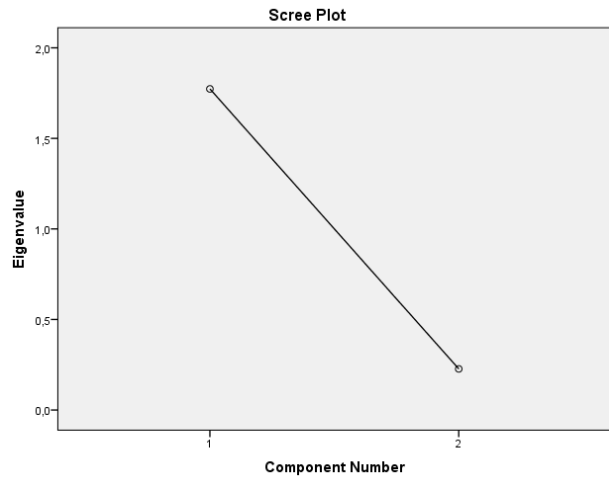


Figure 10: "Social Responsibility" Factor

In the factorial analysis of the "Hospital Reliability" Factor, it is noted that in sig (1-tailed) all three variables are significant at a significance level of 0.05. The factor KMO was found to be 0.795 (< 0.8), so it is considered statistically significant and if the KMO sig is 0.000 (less than 0.05), the assumption of no significant correlations at the 5% significance level is rejected. Cronbach's has a value of 0.920 that is greater than 0.000. Therefore, the factor is credible and has good consistency. In the following graph, the eigenvalue is greater than one (Figure 11):



Figure 11: "Hospital Reliability" Factor

5.2. Linear reciprocating model test

During the ANOVA test, the Sig of the statistical F is 0.000 < 0.05 and therefore the model variables are linearly correlated. The Coefficients table shows that there is no collinearity, as all the values of the variables are less than 2. Additionally, autocorrelation control was performed using the Durbin-Watson index. The value of (1,747) is close to 2 and indicates that autocorrelation is not intense. In Table 2, titled Model Summary, the process of determination of the R² factor is recorded.

Table 2: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,931 ^a	,866	,861	,486

^aPredictors: (Constant), Hospital Reliability, Safety Indicators, Infrastructure, Hospital Image, Social Responsibility, Quality of Staff, Administrative Procedure, Clinical Care Process
^bDependent Variable: The degree of evaluation of your overall satisfaction with the quality of the services you received in the hospital

R² = 0.866 > 0.5, meaning that the percentage of variance of the dependent variable is interpreted satisfactorily by the independent variables.

However, as shown in Table 3, titled Coefficients, the variables "Administrative Procedure", "Safety Indicators" and "Hospital Image" do not significantly affect the dependent variable, as the Sig values in the column of values t are 0.561, 0.602 and 0.372 respectively (0.05).

Table 3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,537	,033		105,675	,000
	Infrastructure	,243	,064	,185	3,812	,000
	Quality of staff	,250	,084	,190	2,959	,003
	Clinical care procedure	,351	,091	,268	3,876	,000
	Administrative procedure	,048	,082	,036	,583	,561
	Safety indicators	,027	,052	,021	,523	,602
	Hospital Image	-,055	,062	-,042	-,895	,372
	Social responsibility	,263	,070	,201	3,739	,000
	Hospital Reliability	,198	,085	,150	2,338	,020

From column B (Beta) we get the weighting coefficients of the independent variables that affect the dependent variable.

Therefore, the case under investigation, as stated previously:

H1: There is a significant effect of the dimensions of total quality (as perceived by patients) on patient satisfaction. This is verified in this hospital by the following mathematical equation of the particular model:

$$\text{Patient Satisfaction} = 0,351 \times \text{Clinical Care Quality} + 0,263 \times \text{Social Responsibility} + 0,250 \times \text{Personnel Quality} + 0,243 \times \text{Infrastructure} + 0,198 \times \text{Hospital Reliability}$$

As noted, patient satisfaction in the hospital in question is more dependent on five (5) service quality dimensions, which are on a hierarchical scale: "clinical care", "social responsibility", "staff quality", "infrastructure" and "Hospital reliability". The other three (3) quality dimensions, i.e. "administrative procedure", "safety indicators", "hospital image" have not been found to have a statistically significant relationship with the satisfaction of patients in the hospital. Based on the above, the conceptual model to measure patient satisfaction presented is formulated as follows:

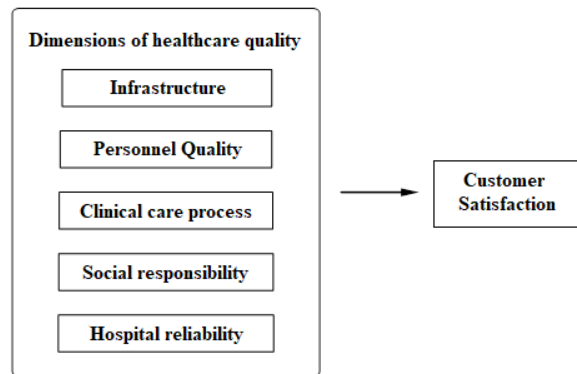


Figure 12: Patient Satisfaction Measurement Model

Since patient satisfaction is a measure of overall quality of service performance, quality dimensions that have a significant impact on overall quality of service are "clinical care", "social responsibility", "quality of staff", "infrastructure" and "hospital's credibility" as shown in Figure 13.

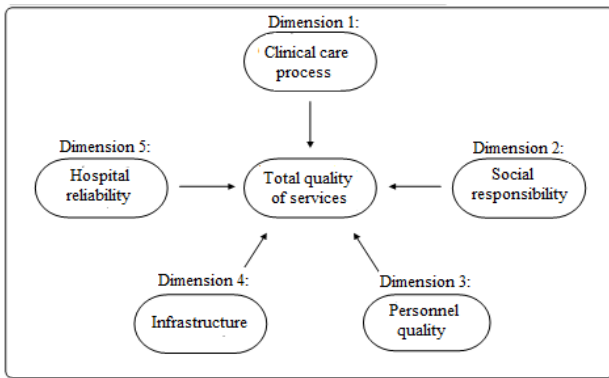


Figure 13: Overall quality of hospital services

6. Discussion

From the Descriptive Statistics Table of the Statistical Analysis and in particular from the Arithmetic Mean (AM), useful information can be drawn on how patients customers perceive the quality of the services, ranging from one to five on the individual subjects of the questionnaire by dimension.

Of course, weight should be given to dimensions that have been found to have a statistically-significant relationship to overall quality, such as the predominant clinical care process. The extensive check does not reveal any special discrepancies in dimensional rating. The overall evaluation in almost all quality dimensions is satisfactory (AM: ~ 3.5), which can be improved at all points.

However, it is noteworthy that the "administrative process" dimension in relation to "the level of opinion and complaints from patients to improve the hospital" has a very small arithmetic mean (AM: 2.40 < 5), which should concern the Administration. According to Stern et al. (2010) an important and integral part of any management process is the monitoring and feedback on the organization's activities. Each organization needs to know if it is acting effectively and if its activities have been accepted by their recipients in the way they were intended. Management should sensitize customers to make their complaints in order to be able to receive continuous refueling to improve the quality of services provided. An additional basic label could be related to the "level of inpatient infections", where the results are relatively low (AM: 2.90).

7. Conclusions

In order to investigate the above model, the case study method was utilized. The survey was conducted in a public regional hospital, using an appropriately structured questionnaire to quantify patient satisfaction with benchmarks of the above-mentioned quality dimensions.

The hypothesis on the significant impact of critical dimensions on the overall quality of hospital care in the hospital was examined. Research has shown that dimensions that have a significant effect on patient satisfaction, which is a measure of overall quality of health services, are the "clinical care process", "social responsibility", "staff quality", "infrastructure" and "hospital reliability".

The "clinical care process" dimension was found to be

the most important factor in predicting the overall quality of health services, followed in turn by the dimensions of "social responsibility", "quality of staff", "infrastructure" which were found to have a similar effect on overall quality and finally, the "hospital's credibility" dimension.

It is clear that the components of the "clinical care process", i.e. primary quality, technical quality, treatment and outcome, reliability, understanding of the disease, are the key factors for patients' satisfaction and thus the overall quality of hospital care. These should primarily be addressed by the Hospital Administration, and consequently the components of the other four dimensions. Findings can be a source of feedback to hospital management, meaning that they essentially lead to improved adjustments or serve as a basis for process reengineering.

The comparison of the present findings with other corresponding research results presents degrees of difficulty, as the typology of the parallelism should first be investigated and their similarity identified in order to allow their comparability. Additionally, it should be borne in mind that, like Gupta et al. (2011), values and beliefs that have been shaped by the environment or during social interactions evolve into emotional connections that play an important role in the consumer decision-making process. It is therefore justified that there may be some variations with regard to the present findings compared to those that have been bibliographically drawn, as they are part of different cultures.

More generally, research findings are consistent with other surveys, such as Gronroos (1982), Baldwin and Sohal (2003), Rohini and Mahadevappa (2006) and others. In the main part of the bibliographic review and according to Padma et al. (2010), the "clinical care process" dimension is second in terms of its impact on the overall quality of services, while "staff quality" and/or "administrative process" comes first, which has proved to be statistically insignificant in this particular survey.

This finding can be explained by the fact that in Greece and especially in the periphery, the patient is usually accompanied by a relative who somewhat compensates for the human element of the care provided and is usually the one who is performing the administrative procedures. Adding to the above, it is stated in the demographic data that the "Marital status" variable was the highest, as the majority of the sample (72.8%) belonged to this category.

The finding that the "clinical care process" has emerged as the most important dimension in regards to the impact on the overall quality of services can be explained by the fact that in the demographic data in the variable "level of education" the sample rate of primary education graduates was only 37, i.e. it rose up to 17,4% of the sample. Therefore, the highest technical quality requirements may be due to the relatively high level of education of the sample combined with information provided by the internet.

The impact rates on the overall quality of the dimensions of "social responsibility", "infrastructure" and "hospital credibility" can be interpreted in line with the modern trends of developed countries.

7.1 Possible methodological weaknesses and proposal for future research by other researchers.

The present study has limitations due to the

generalization of research results, as it was carried out in a single medium-sized hospital in the region. A further continuation of the research may be the measurement of the overall quality of the hospital services provided by their escorts, since they can also be considered as customers, as discussed in the corresponding section. In

addition, useful information can be provided by the measurement of satisfaction of the hospital's staff.

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