Health Care Quality in Greek NHS Hospitals:
No one knows better than patients

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Abstract

Purpose: Healthcare organizations operating in the public sector are experiencing increasingly low trust on the part of the patients in terms of the quality of care provided. Today people hoping to receive high service quality tend to prefer private hospitals or even travel abroad. Thus, National Health System Hospitals are undergoing pressure from governments and the general public to improve their quality and compete effectively. With this in mind, the purpose of this paper is fourfold. *First,* to identify the relevant service - quality dimensions used by Greek patients to evaluate service quality. *Second,* to assess patients' perceptions and expectations related to the quality provided by public hospitals. *Third*, to investigate how closely patients' perceptions and expectations of service quality match. *Fourth,* to determine the relative importance of quality dimensions in influencing patients' overall quality perceptions.

Methodology: Empirical research is used to determine patients' perceptions and expectations of service quality in NHS hospitals located in North Greece. In this study SERVQUAL instrument was used to measure the service quality. The SERVQUAL questionnaire included an expectations' and a perceptions' section, each consisting of 26 statements. In addition, the questionnaire contained i) an extra section relating to demographics (e.g. age, gender, education) and ii) an overall question on the impression of quality of service provided. Due to the recognized instability of the dimensionality of SERVQUAL, it was considered necessary to test this instrument for its usefulness in the Greek hospital environment. Questionnaires were distributed and explained to the patients in the hospital wards on the day they were discharged from the hospital. One hundred and thirty seven (137) satisfactorily completed questionnaires were collected.

Findings: The analysis revealed that patients perceived receiving a rather satisfactory level of health care quality across all SERVQUAL dimensions. However, the results of this study showed that a gap exists between the rating which patients assign to expectations and to perception statements. In fact, expectations exceed perceptions of the provided service quality, suggesting that there is room for quality improvement initiatives. Finally, despite the criticism of the SERVQUAL instrument, in the present study it proved to be a useful tool (in terms of its validity and reliability) for

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measuring quality in the health care sector. Additionally, SERVQUAL can be considered as a flexible tool since it allows modification to incorporate the idiosyncrasies of specific industry or/and national context.

Originality/value of paper: This paper sheds light on a poorly researched field in the Greek context. The results clearly establish the areas where quality improvements are more demanding. Further, it provides directions for hospital managers and policymakers to develop strategies which will meet patients' expectations of service quality, restore patients' trust in public hospitals and increase thus their competitiveness. Finally, it gives support to the view that, although difficult, service quality in the health sector can be measured and consequently be monitored systematically in order to narrow previously identified gaps and take corrective actions when necessary.

Keywords: SERVQUAL, Public Hospitals, Greece, Research.

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Introduction

The Greek government addressing the long standing crisis in the health sector established the National Health System (NHS) in 1983 which is considered as a pathbreaking initiative in the health care field. The main goals of the reform were the separation of private and public sector, the empowerment of public health sector, the development of primary care, increases in public spending on health, decentralization, reorganization of hospitals, improvements in manpower policy, efficiency, equity in terms of equal accessibility and social control (Tountas et al., 1995). Several ambitious reform efforts followed in the next 24 years (1997, 2001). It is noteworthy to remark that in March 2004 the Ministry of Health care provision was renamed in Ministry of Health and Social Welfare (MOHAW) reflecting the contemporary human-centered approach to health care services provision which places at the heart of the system the respect and satisfaction of the physical, psychological and social needs of the health care service recipients. Further, the following 2005 reform (Law No. 3329/05) introduced the framework for Clinical Governance implementation which includes ten central pillars of action: economic rationalisation and sustainability of the NHS, establishment of a modern primary care network, dynamic promotion of proactive health care policy, introduction of information and new technologies in all administrative levels, new manpower policy, reform in psychological and public health, development of voluntarism and corporate social responsibility, education-research and innovation promotion, public and private sector partnership policy, promotion of the Greek health sector at the global market and health society (MOHAW, 2007).

Despite these efforts and reforms, healthcare organizations operating in the public sector in *Grece are still experiencing low trust* on the part of the *patients in terms of the quality of care provided and of the degree of responsiveness to patients' needs.* People hoping to receive high service quality tend to prefer private hospitals or even travel abroad. Thus, NHS Hospitals in Greece are undergoing pressure to improve their quality and compete effectively. Pressures both from the government and the general public which in its vast majority have low income and realise that they have no alternative to turn to(Karassavidou and Glaveli, 2007).

However, service *quality is an abstract, elusive and multidimensional construct* more difficult for consumers to evaluate than goods quality since it is evaluated both on the results obtained (technical quality) and the process of service delivery (functional quality) (Gronroos, 1983). Quality is even *more difficult to evaluate in the health care sector* due to the unique character of the service provided. Health care service is provided by professionals and frequently no tangible output is produced. Moreover, it is characterised by high involvement in the delivery process and low expertise of the purchasers/users, as well as by the risky nature of the service (Taner and Antony, 2006). On the other hand, patients are quite unique as customers they are worried about the outcome of the teatment, the process of being treated, the seriousenss of the underlying situation and are also anxious about those left back home. These characteristics make the conceptualisation and measuring of service quality in health care settings more important and more complex. Hospitals to maintain and improve the quality of service provided should not focus only on clinical and economic criteria. Patients' expectations and perceptions of care surveys are thus an important tool that managers and asministrators could utilise to evaluate and continuously monitor quality with the focus of tracing the weaker aspects of the health care delivery system.

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In this frame, *the purpose of this paper is fourfold. First,* to identify the relevant service - quality dimensions used by Greek patients to evaluate service quality. *Second,* to assess patients' perceptions and expectations related to the quality provided by public hospitals. *Third*, to investigate how closely patients' perceptions and expectations of service quality match (quality gap). *Fourth,* to determine the relative importance of quality dimensions in influencing patients' overall quality perceptions.

Service quality

Service quality has been revealed as a key factor in search for sustainable competitive advantage, differentiation and excellence in the service sector (Jabnoun and Al Rasasi, 2005; Jun et al., 1998). Also, it has been recognised as highly important for satisfying and retaining customers (Spreng et al., 1996; Reicheheld and Sasser, 1990).
Service quality has been approached as a multidimensional construct. SERVQUAL developed by Parusaraman et al. (1985; 1988), has been extensively accepted and utilised as a generic instrument that captures the multidimensionality of service quality. Parasuraman et al. (1985), had originally identified ten dimensions of service quality which were, at a later stage and after extensive explorative research and empirical testing, operationalised in five dimensions that included 22-items (Parasuraman et al., 1988). These five dimensions include:
  1. *Tangibles*: physical facilities, equipment and appearance of personnel.
  2. *Reliability*: ability to perform the service accurately and dependably.
  3. *Responsiveness*: willingness to help customers and provide prompt service.
  4. *Empathy*: caring and individualised attention provided to customers.
  5. *Assurance*: employees' knowledge, courtesy and ability to convey trust and confidence.
According SERVQUAL service quality results from a comparison of expectations with perceptions of service quality. This is a *user-based approach* implying that customers have some expectations with respect to service performance prior to the delivery of service, which is compared with their perceptions of the actual service delivered. This comparison is not restricted only to the results of the delivered service but also to the process of service delivery and the interaction between the buyer and the seller (Gronroos, 1990)
The SERVQUAL approach has not been without its critics. There has been concern about the central role of expectations and the significance of a subtractive "gap" as a measure of quality (Asuboteng et al., 1996; Buttle, 1996). Moreover, the universality of SERVQUAL dimensons across different types of services has been questioned (Mostafa, 2006; Jiang et al., 2000; Babakus and Mangold, 1992; Carman, 1990). A further critic refers to its negglect of dimensions such as price and access (Gilmore and Carson, 1992).
Despite its critics, SERVQUAL has been widely used in many service industries including hotels, travel, higher education, real states, accountancy, architecture, construction services, hospitals, dentistry, call - centres (Foster, 2001). Indeed, *in health care most studies that explore quality apply SERVQUAL*. The focus of these studies varies and refers to: identification of the dimensions of service quality and assessment of the level of quality provided by hospitals or across a number of service categories provided by the hospital (Mostafa, 2006; Sohail, 2003; Wong, 2002; Lim and Tang, 2000; Tomes and Chee Peng NG, 1995; Sewell, 1997), comparisons on the level of quality provided between i) public and private hospitals (i.e. Camilleri and

Callaghan, 1998; Jabnooun and Chaker, 2003; Taner and Antony, 2006) ii) different areas of hospital offerings: emergency room services, inpatient services and outpatient services (Reidenbach and Sandifer-Smallwood, 1990). Also, SERVQUAL was utilised in studies that refer to the development of scales to measure hospital service quality (Vandamme and Leunis, 1993; Tomes and Chee Peng NG, 1995) and investigation of the relationship between service quality and other variables such as leadership style (Jabnoun and Al Rasasi, 2005), patient satisfaction (Reidenbach and Sandifer-Smallwood, 1990; Andaleeb, 1998), patients willingness to recommend the hospital to friends (Reidenbach and Sandifer-Smallwood, 1990).

Methodology

Sample and Data collection
To determine patients' expectations and perceptions of service quality as well as the relevant quality gaps, a survey was conducted in six NHS hospitals located in North Greece. Questionnaires were distributed and explained to the patients in the hospital wards on the day they were discharged from the hospital. One hundred and thirty seven (137) satisfactorily completed questionnaires were collected.

Questionnaire design and structure
The SERVQUAL was used to measure service quality. More precisely, the questionnaire included an expectations' and a perceptions' section of service quality, each consisting of 26-items. The twenty-two (22) items were derived from Yousef et al., (1996) adapted version of the Parasuraman et al., (1988) SERVQUAL, to make it more relevant to hospital services. Based on the relevant literature (Lim and Tsang, 2000) and an evaluation by academics and medical practitioners one of the 22 -items was discarded and four extra items were supplemented to incorporate elements of price, access and catering. In addition, the questionnaire contained i) an extra section relating to demographics (age, gender, education and income) and ii) a question on the overall evaluation of the quality of service provided. The questions were close end. A seven-point Likert scale was used, where (1) is "strongly disagree" and (7) "strongly agree" meaning that higher scores indicate higher expectations and better patients' evaluations of the quality of service provided.

To assess the face validity of the questionnaire items, the scales that were initially in English were translated into Greek and then back- translated. Then, prior to data collection the questions were piloted through personal interviews with a sample of 5 patients. The corrections mainly concerned the phrasing of the questions in Greek.

Results and Discussion

Profile of the respondents
Female respondents represented a little more than 50% of the survey population. The largest groups of respondents (29.9%) were aged 41-50 years. The next largest groups, over 50 years and 26-40 years, represented 25.5% and 14.8% respectively. The smaller group of respondents (19.7%) was aged 18-25 years. Personal income was measured in euros and not surprisingly the vast majority of respondents, over 86%, reported a monthly income lower than 1500 euros, indicating that public hospitals are mainly used by people with low income who have no other choice. In

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terms of occupations about 50% of the respondents were employed in public and civil sectors, whereas 22.6% were self - employed.

Construct validity and reliability of the instrument
Considering i) the first objective of the present study according to which the major factors underlying the service quality provided by the Greek NHS hospitals are investigated and ii) the recognised in the relevant literature instability of the dimensionality of SERVQUAL, it was considered necessary to address the construct validity of the study.

It is noteworthy that in the literature about SERVQUAL, there is no agreement as to which scores (expectation, perception or quality gap scores) should be factor analysed to test for the dimensionality of service quality. Indeed, all three types of scores have been used in previous research (Vandamme and Leunis, 1993). In the present study we adopt Vogels et al (1989) view which suggest that the expectation scores should be factor analysed to determine the items that should be included in the service quality dimensions because "…these scores are not influenced by possible flaws in the service rendered by various firms in the industry…". Thus, in the present study, SERVQUAL scale was factor-analysed by principal component analysis in the expectation scores. A rotation procedure was applied to maximise the correlations of item on a factor (Comrey and Lee, 1991). After oblique rotation four factors were extracted. However, since the fourth factor included only one item "Doctors/staff would never be too busy to respond to patients request" it was decided to drop it. Consequently, three factors were finally considered (see Table 1). To measure the adequacy of the sample for extraction of the three factors the Kaiser-Mayer-Olkin (KMO) measure was computed. The KMO value (.931) indicates that the examined data set is highly adequate for factor analysis (Kim and Mueller, 1978). Moreover, the data set was found to be multivariate normal and acceptable for factor analysis according to Bartlett's test of sphericity (p = 0.000)

Total variance explained (67.558%) by these three components exceeds the 60% threshold usually accepted in social sciences to support the solution (Hair et al., 1995). The first factor, which explained 34.279% of the total variance, was labelled - The *human aspect* of the health care service quality. Factor 1 contains 16 items similar in nature to assurance, reliability and empathy in this sense it *could be regarded as the "soft" dimension of quality*. The second factor, explained 21.398% of the total variation and was labelled - *Physical environment and infrastructure*. This factor includes 7 items related to the tangibility of the provided service. Factor 3 explained 11.882 % of the total variance and was named *Access*. In this factor, two (2) items are included referring to access to the hospital services as well as to its facilities. The resulted third factor fully supports our decision to incorporate the relevant items in the SERVQUAL questionnaire.

The current research results highlighted that the structure proposed by Parasuraman et al., (1988) for the SERVQUAL scale was not confirmed. This finding is in line with previous relevant studies (i.e. Carman, 1990; Reidenbach and Sandifer-Smallwood, 1990; Lytle and Mokwa, 1992; Licata et al., 1995; Lim and Tang, 2000).

An internal consistency analysis was performed to assess the *reliability* aspect of the derived three dimensions. The value of the *alpha coefficient* ranged from .758 to .996 (alpha > .70, see Table 1) indicating that the three dimensions are reliable measures of service quality (Nunnaly, 1978).

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Descriptive statistics

I. Expectations
The mean scores of expectations were high (see Table 1) ranging from the lowest 5.66 for " Informative brochures about the provided service are available to patients" (item 23) to the highest 6.52 for " Doctors have a wide spectrum of knowledge and are competent" (item 16). The high mean values of the expectation scores have been anticipated and are in line with previous studies in the field (i.e. Taner and Antony, 2006). A possible explanation could be the difficulty to define the *adequate* and the *desired* level of service quality expectations due to the distinctive characteristics of the health care services and particularly its complex and risky nature. Indeed, the latest lead to the formation of a "*narrow zone of tolerance*" in the health care services compared to other service industries.

Among the three dimensions expectations are highest for *the human aspect factor* (mean score = 6.21), a dimension that covers the issues of caring, understanding, courtesy, inspiring security and trust, responsiveness, credibility and competence. *Access* (mean score = 6.12) which refers to accessibility in terms of facilities and services, follows. The dimension of *physical environment and infrastructure* has a mean expectation score of 6.01 and incorporates issues related to the tangible aspects of quality such as modern equipment, cleanliness, visually attractive environment, tasty meals and accurate procedures.

The patients' choices clearly show that four out of the five highest expectation score items (see Table 2) are related to the first dimension - *the human factor* - which turns to be the most critical of hospital services. In fact this findings reflects the *traditional view of the doctor-patient relationship* (Tomes and Chee Peg Ng, 1995). A relationship that emphasises doctors' competence in clinical skills, their ability to instil confidence and security in their patients and finally gain their trust. This is a message from patients to hospital managers and physicians/staff when dealing with patients. The five lowest expectation scores (see Table 3), in fact confirm the above since four out of the five are captured in the *physical environment and infrastructure dimension.*

II. Perceptions
The mean scores of the perception statements ranged (see Table 1) from 4.15 for "meals are tasty and adapted to patients nutritious needs" (item 22) to 5.34 for "Doctors have a wide spectrum of knowledge and are competent" (item 16). The only one item that scored lower than 4.15 was the item 24 "Informative brochures about the provided service are available to patients" (mean score = 2.85).

Among the three dimensions of service quality, patients appear to be more satisfied with *access* (mean score = 4.88) followed by *the human aspect factor* (mean score = 4.65) and *physical environment and infrastructure dimension* (mean score = 4.65). Probably, since patients feel little control over doctors in terms of being capable to judge their knowledge and expertise, they tend to be more critical with the hotel/tangible element of service. This is probably due to the fact that a comfortable, clean environment and good catering helps them relax and deal better with their anxieties.

The hospitals performed rather satisfactorily with regard to doctors' knowledge and competence (mean score = 5.34; See Table 4). Further, the staff was thought to be willing to help patients (mean score = 5.02). Also, patients gave a relative satisfactory score related to accessibility of the hospital facilities (mean score = 5.31). The

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evaluation of patients felt below 5 for " Patients feel secure in receiving medical care" (mean score = 4.96) and " Doctors and staff are always neat" (mean score = 4.90). Three out of the five items with the highest perception scores are included in *the human aspect* of the health care service quality dimension. On the other hand, it is noteworthy to remark that the least scored were items 22 (informative brochures) and 23 (meals). These items also received the lowest expectation scores (see Tables 2 and 4). Indeed, public hospitals are known (word of mouth impact on expectations formulation) for providing low quality of hotel services.

III. Gap scores and t-test

Gap scores were calculated for item and quality dimensions. The gap score for each item was computed by subtracting expectations from perceptions. Following, the gap scores for all the items in each dimension were added and divided by the number of items in the particular dimension (mean dimension quality gap). Using a two tailed test and a 5 per cent level of significance it was found that the differences between perceptions and expectations for each item, as well as for each of the three dimensions, are statistically significant since p value equals 0.000 for each item and dimension gap. Therefore, it could be concluded that *service quality gaps exist in Greek hospitals.*

It is interesting to point out that, in comparison to the other two dimensions, the *physical environment and infrastructure dimension obtained the lowest expectation and perception score* and at the same *the largest* quality gap (mean score = - 1.75; see Table 1). This finding suggests that there is a room for improvement on the part of the managers and administrators. Moreover, since this factor is related to tangibles it might contribute to depressing patients, who are in any case already worried about their health condition (Angelopoulou et al., 1998).

Three of the largest differences between expectations/perceptions (items 4,8,12) are in *the human aspect* dimension (see Table 6). Patients evaluations suggest that they are disillusioned regarding services being performed when expected, in relation to attention being paid and information provided concerning their medical condition. The rest two of the highest quality gap scores (items 17 and 23) are in the *physical environment and infrastructure dimension. They* refer to the lack of informative brochures available to patients and the adequacy of hospital equipment.

The hospitals appear to perform relatively better (see Table 7) as far as staffs' willingness to help patients and treat them with dignity and respect, as well as the knowledgeable and competent doctors, is concerned (items 3,16,10). These issues are included in *the human aspect* dimension. Accessibility to the hospitals facilities and doctors'/staffs' neat appearance present the less problematic areas of service quality delivery process.

IV. Relative importance of service quality dimensions

To examine the effect of the quality gaps - in the three dimensions - on the patients' overall evaluation of the quality of the service provided by the hospitals (general question in the questionnaire), regression analysis was performed. The three quality gaps were used as the predictors of overall quality of the services provided. Considering the independent variables with statistically significant coefficients, it is evident that patients' perceptions of service quality are attributed to *the human aspect quality* gap (see Table 8), which is in fact the predictor of overall service quality. The above research finding is a worth reporting since it indicates that the quality of the

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provided health care to patients treated in the Greek NHS hospital *depends heavily on improving the human aspect* of quality (Factor 1).

Nevertheless, it could be supported that this point of view reflects only one side of the coin. Quality improvement initiatives should address all the three factors since the quality gaps in the three factors since the quality gaps in the three dimensions proved to be statistically significant and highly correlated (see Table 9).

Conclusion

The present paper sheds light on a poorly researched field in the Greek context. It provides health care managers, administrators and policy makers with a conceptual and operational framework to measure and manage service quality. A frame that adopts patients' orientations since it integrates their expectations and perceptions related to the service provided. To the best of our knowledge, the broadly used SERVQUAL instrument was utilised for the first time in the health care sector in Greece. The results revealed that three dimensions of service quality capture the content of quality in the Greek context: *human aspect, physical environment/ infrastructure* and *access.* Despite the criticism of the SERVQUAL instrument, in the present study it proved to be a flexible, reliable and valid for measuring quality in Greek hospitals.

The analysis revealed areas in which hospitals are close to meeting patients' expectations and areas in which hospitals fall far short of expectations. This is particularly true in the case of the *physical environment and infrastructure* dimension followed by *human aspect and access.* In general, expectations exceed perceptions of the provided service quality, suggesting that there is room for quality improvement initiatives in all three dimensions. However, *the human aspect quality gap was found to be the most important area for improvement and in fact the predictor* of the overall service quality evaluation. The latest finding reveals the importance of building a *strong relationship* between patients and doctors/staff. A relationship based on respect, dignity, courtesy and genuine caring for the patients, putting it in other words to place the patient at the center of the health care system.

To sum up, the results clearly establish the areas where quality improvements are more demanding and have important implications for hospital managers, doctors/dtaff and policymakers. They give direction towards the development strategies which will meet patients' expectations of service quality, restor patients' trust in public hospitals and increase thus their competitiveness. Finally, it gives support to the view that, although difficult, service quality in the health sector can be measured and consequently be monitored systematically in order to narrow previously identified gaps and take corrective actions when necessary.

However, it should be kept in mind that patients' beliefs, perceptions and expectations can not be fully captured in a questionnaire. Therefore, the use of qualitative research along quantitative methods in future studies would provide a better understanding of the complex issue of quality in the health care sector.

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Table 1: Dimensions of health care service quality (based on patients expectations), mean scores for patients' expectations, perceptions and quality gaps and t-test

Items	Factor loadings	Mean expectation score	Mean perception score	Mean quality gap scores	t-value
Factor 1: Human aspect		**6.21**	**4.65**	**- 1.56**	**0.000**
(% of variance explained = 34.279; Cronbach's a = .996)					
1. Doctors / staff understand the specific needs of customers	.811	6.14	4.49	- 1.65	0.000
2. Doctors/staff should have patient's best interests at hart	.780	6.18	4.46	- 1.72	0.000
3. Patients should be treated with dignity and respect	.758	6.23	4.87	- 1.36	0.000
4. Doctors/staff should explain thoroughly medical conditions to patients	.750	6.14	4.36	- 1.78	0.000
5. Doctors/staff listen to patients and keep them informed	.745	6.17	4.49	- 1.69	0.000
6. Attitudes and behaviours of doctors/staff instil confidence in patients	.741	6.28	4.76	- 1.52	0.000
7. Friendly and courteous doctors and staff	.738	6.13	4.66	- 1.47	0.000
8. 24 hours service to patients is available	.733	6.21	4.39	- 1.82	0.000
9. Doctors/staff would give patients individualised attention	.720	5.98	4.20	- 1.78	0.000
10. Hospital staff is always willing to help patients	.709	6.11	5.02	- 1.09	0.049
11. Patients feel secure in receiving medical care	.618	6.32	4.96	- 1.36	0.000
12. Prompt service is provided to patients	.596	6.11	4.26	- 1.84	0.000
13. Error free documentation is provided	.594	6.27	4.67	- 1.60	0.000
14. Affordable charges for services are rendered	.584	6.23	4.67	- 1.55	0.000
15. Doctors/staff exhibit sincere interest in solving patients' problems	.567	6.31	4.80	- 1.51	0.000
16. Doctors have a wide spectrum of knowledge and are competent	.563	6.52	5.34	- 1.18	0.000
Factor 2: Physical environment and infrastructure		**6.01**	**4.26**	**-1.75**	**0.000**
(% of variance explained = 21.888; Cronbach's a = .915)					
17. The hospital's equipment is up-to-date and well maintained	.756	6.20	4.31	- 1.88	0.000
18. Services are provided at appointed time	.738	6.14	4.38	- 1.76	0.000
19. Clean, comfortable and visually attractive environment	.709	5.91	4.39	- 1.52	0.000
20. Doctors and staff are always neat	.697	5.98	4.90	- 1.08	0.000
21. Services are carried out right at the first time	.672	6.28	4.84	- 1.44	0.000
22. Meals are tasty and adapted to patients' nutritious needs	.632	5.87	4.15	- 1.72	0.000
23. Informative brochures about the provided service are available to patients	.563	5.66	2.85	- 2.80	0.000
Factor 3: Access		**6.12**	**4.88**	**-1.24**	**0.000**
(% of variance explained = 11.882; Cronbach's a = .758)					
24. The hospital is easily accessible (e.g. parking facilities)	.781	6.17	5.31	- .85	0.000
25. Hospital services are easily accessible	.745	6.08	4.45	- 1.63	0.000

Note: Extraction method: principal component analysis,
Scores based on 7-point scale ranging from 1= strongly agree and 7= strongly disagree,
All-means significantly different between expectation and perception scores at 95% confidence level (2-tailed tests)

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Table 2: The five statements with the highest expectation scores

Items	Mean expectation score
16. Doctors have a wide spectrum of knowledge and are competent	6.52
11. Patients feel secure in receiving medical care	6.32
15. Doctors/staff exhibits sincere interest in solving patients' problems	6.31
21. Services are carried out right at the first time	6.28
6. Attitudes and behaviours of doctors/staff instil confidence in patients	6.28

Table 3: The five statements with the lowest expectation scores

Items	Mean expectation score
23. Informative brochures about the provided service are available to patients	5.66
22. Meals are tasty and adapted to patients' nutritious needs	5.87
19. Clean, comfortable and visually attractive environment	5.91
9. Doctors/staff would give patients individualised attention	5.98
20. Doctors and staff are always neat	5.98

Table 4: The five statements with the highest perception scores

Items	Mean perception score
16. Doctors have a wide spectrum of knowledge and are competent	5.34
24. The hospital is easily accessible (e.g. parking facilities)	5.31
10. Hospital's staff is always willing to help patients	5.02
11. Patients feel secure in receiving medical care	4.96
20. Doctors and staff are always neat	4.90

Table 5: The five statements with the lowest perception scores

Items	Mean perception score
23. Informative brochures about the provided service are available to patients	2.85
22. Meals are tasty and adapted to patients' nutritious needs	4.15
9. Doctors/staff would give patients individualised attention	4.20
12. Prompt service is provided to patients	4.26
17. The hospital's equipment is up-to-date and well maintained	4.31

Table 6: The five statements with the highest quality gap scores

Items	Mean quality gap scores
23. Informative brochures about the provided service are available to patients	- 2.80
17. The hospital's equipment is up-to-date and well maintained	- 1.88
12. Prompt service is provided to patients	- 1.84
8. 24 hours service to patients is available	- 1.82
4. Doctors/staff should explain thoroughly medical conditions to patients	- 1.78

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Table 7: The five statements with the lowest quality gap scores

Items	Mean quality gap scores
24. The hospital is easily accessible (e.g. parking facilities)	- 0.85
20. Doctors and staff are always neat	- 1.08
10. Hospital staff is always willing to help patients	- 1.09
16. Doctors have a wide spectrum of knowledge and are competent	- 1.18
3. Patients should be treated with dignity and respect	- 1.36

Table 8: Regression model for the overall quality gaps in the three dimensions and overall quality perceptions

	B	Beta	t	p
Overall quality perceptions				
(Constant)	5.321		41.200	.000
1. Human aspect	.451	.563	4.480	.000
2. Physical environment and infrastructure	.100	.117	1.054	.294
3. Access	-.048	-.065	-.710	.479

Note: Dependent variable: overall question on quality perceptions

Table 9: Correlations between the computed quality gaps in the 3 resulted dimensions (factors)

	1	2	3
1. Human aspect (Factor 1)	1		
2. Physical environment and infrastructure (Factor 2)	.789**	1	
3. Access (Factor 3)	.667**	.536**	1

Note: ** (Pearson) Correlation is significant at the 0.01 level (2-tailed).