



Service quality and its impact on customer satisfaction in Indian hospitals

Service quality
in Indian
hospitals

Perspectives of patients and their attendants

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Abstract

Purpose – The purpose of this paper is to conceptualize hospital service quality (SQ) into its component dimensions from the perspectives of patients and their attendants; and to analyze the relationship between SQ and customer satisfaction (CS) in government and private hospitals in India.

Design/methodology/approach – The study employs questionnaire-survey approach to obtain the perceptions of patients and attendants. The instruments developed have been validated using tests for reliability, validity and uni-dimensionality. Data collected have been analyzed by using statistical techniques such as bi-variate correlation and multiple regression.

Findings – Patients and attendants treat the interpersonal aspect of care as the most important one, as they cannot fully evaluate the technical quality of healthcare services. The study also revealed that the hospital service providers have to understand the needs of both patients and attendants in order to gather a holistic view of their services.

Research limitations/implications – Results of the study are dependent on the nature and number of respondents, i.e. the study has captured only the perceptions of service receivers – patients and attendants; and sample size of the study – 204 patients and 204 attendants – due to limited response rate and other operational constraints.

Practical implications – The present study allows the hospital administrators to benchmark their hospitals with those of their competitors by comparing the mean values of the dimensions of SQ. The study also allows a comparison of the performance of government and private hospitals in terms of the services offered.

Originality/value – The study conceptualizes hospital SQ as an eight-dimensional framework. Further, it also presents the relationship between SQ and CS in Indian Government and private hospitals.

Keywords Customer satisfaction, Hospitals, Patients, Customer services quality, India

Paper type Research paper

1. Introduction

The world's rising population and increasing standards of living have driven significant growth within the global healthcare services sector, as consumers have demanded better medical care to support their improving lifestyles. Of late, India is becoming a preferred healthcare destination for neighboring countries and the West due to low cost and high quality of treatment available, giving rise to the term "medical tourism". In India more than 50 percent of the total health expenditure comes from individuals, as against the state-level contribution of below 30 percent. The government funds allocated to healthcare sector



have always been low in relation to the population of the country. In the private sector healthcare industry, healthcare facilities are run for profit by companies. Healthcare facilities run by charitable organizations also provide services totally free or at very low costs depending on the income of the patient or patient's family. A majority of the private sector hospitals are small establishments with 85 percent of them having < 25 beds. Private tertiary care institutions providing specialty and super specialty care account for only 1-2 percent of the total number of institutions while corporate hospitals constitute < 1 percent. The private sector accounts for 82 percent of all out-patient visits and 52 percent of hospitalization at all India level (Royal Danish Embassy, 2006).

The type of healthcare service requirement has changed due to the rise of lifestyle-related diseases such as diabetes, cardiovascular diseases and diseases of the central nervous system. With the decline in birth rates, the population aged 0-14 has declined, while on the other hand improvement in life expectancy has led to an increase in the old age population. On average, this has led to higher per capita demand for health services (Investment Information and Credit Rating Agency of India, 2005). Infrastructure facilities remain an important area of concern for India. Roads and transport facilities connecting remote parts of India to towns and cities are yet to be fully developed, which makes accessibility of healthcare services from rural and semi-rural areas, difficult. The Government of India plans to improve health infrastructure by upgrading and increasing the total number of hospitals, clinics and clinical laboratories in urban and rural areas. Telemedicine service, which allows even the interiors to access quality healthcare, increase the patient base, thus increasing occupancy rates of hospitals, is expected to grow. This should in turn create demand for diagnostic medical equipment such as X-rays, CT-scanners, ultrasound, electrocardiographs and so on (Indo-Italian Chamber of Commerce and Industry, 2007). In spite of lacunae in infrastructure, the future appears bright for the growth of Indian healthcare industry, with the healthcare consumption expected to triple in 2015 (CII-McKinsey, 2007). India offers to become the right destination for healthcare outsourcing to the Western market.

Petersen (1988) opined:

It really does not matter if the patient is right or wrong. What counts is how the patient felt even though the caregiver's perception of reality may be quite different.

Hospitals that fail to understand the importance of delivering customer satisfaction (CS) may be inviting possible extinction (Andaleeb, 1998). Several researchers have established that service quality (SQ) not only influences the satisfaction of buyers but also their purchase intentions. Even though there are other antecedents to CS, namely, price, situation, and personality of the buyer (Natalisa and Subroto, 1998), SQ receives special attention from the service marketers because it is within the control of the service provider, and by improving SQ, its consequence CS could be improved, which may in turn influence the buyer's intention to purchase the service. Thus, delivering quality service is pivotal to drive satisfaction. As production and consumption of the service occur simultaneously, strategies that acknowledge the importance of the consumer must be integrated into the hospital healthcare delivery systems process (Craig *et al.*, 2007).

The Indian healthcare industry would face strong competition in the coming years from local corporate firms and foreign players in healthcare services and medical devices market. In order to sustain, the Indian players have to improve their quality

and standardize their processes on par with their international counterparts. Implementing some of the guidelines enunciated in business excellence frameworks like Malcolm Baldrige National Quality Award (MBNQA, 2007) and accreditation requirements for healthcare industry like Joint Commission International (JCI, 2007), would aid such efforts. The Indian Government has to increase its share of contribution to the healthcare as 80 percent of the healthcare investment is done by private players. Dearth of trained professionals is a huge threat looming over the industry which could be overcome by starting institutes of public-private partnerships. There has to be stringent laws put forth by the government regulating the laboratories, healthcare facilities and diagnostic facilities. Moreover, Sahay (2008) noted that though hospitals in India provide high-quality treatment, they are very poor in customer service. Hence, it becomes imperative to understand where and how to improve functional aspects of service provided.

2. SQ and CS in healthcare

The healthcare service can be broken down into two quality dimensions: technical quality and functional quality (Donabedian, 1980). Technical quality in the healthcare sector is defined primarily on the basis of the technical accuracy of the medical diagnoses and procedures, or the conformance to professional specifications. Functional quality refers to the manner in which the healthcare service is delivered to the patients. Andaleeb (1998) stated: "Hospitals that fail to understand the importance of delivering customer satisfaction may be inviting possible extinction". Consumer marketing research has underscored the importance of consumer in healthcare services as consumer is involved in production and consumption of services simultaneously. Further, consumers along with the firms co-create value to individual consumers, as there is a paradigm shift from product and services to experience environments. Thus, understanding customers' perceptions in healthcare services becomes imperative.

Reidenbach and Smallwood (1990) conducted factor analysis and operationalized SQ in terms of patient confidence, business competence, treatment quality, support services, physical appearance, waiting time and empathy. Several other researchers developed their own frameworks and instruments to conceptualize SQ in hospital services. Vandamme and Leunis (1993) developed a scale to measure SQ provided by hospitals from patients' view. They found tangibles, medical responsiveness, assurance, nursing staff quality and personal beliefs and values to be the dimensions of hospital SQ. Tomes and Ng (1995) developed a measurement scale to assess the quality of service provided by the hospitals in the USA. They concluded that empathy, relationship of mutual respect, dignity, understanding of illness and religious needs were the intangible factors, while food and physical environment were the tangible factors of services offered.

Lam (1997) employed SERVQUAL in healthcare services. It was also discovered that patients treated physical facilities to be the least important. Nursing care, outcome and physician care constituted technical care whereas, food, noise, room temperature, privacy, cleanliness and parking were parts of interpersonal care. According to the study conducted by Hasin *et al.* (2001) in Thailand, communication, responsiveness, courtesy, cost and cleanliness were the component dimensions of SQ in hospitals. They found that even though the hospitals provided good service overall, attitude and behavior of employees about the non-conforming service had to be improved. Baldwin and Sohal (2003) in examining the relationship between SQ practices and SQ outcomes

in dental care found that patient fear and anxiety, patient's appreciation of convenient and punctual service, involvement of patients in treatment were found to significantly influence the patient's perceptions of dental care. Boshoff and Gray (2004) studied the relationship between hospital SQ and patients' buying intentions. They operationalized SQ using the dimensions, communication, tangibles, empathy of nursing staff, assurance, responsiveness of administrative staff, security and physician responsiveness. Otani and Kurz (2004), in their study on hospital services in the USA, found admission process, physician care, nursing care, compassion to family/friends, pleasantness of surroundings and discharge process to be the key dimensions of SQ. Pakdil and Harwood (2005) studied patient satisfaction in a pre-operative assessment clinic. The study showed that patients were most dissatisfied with the waiting time. The hospital should provide prompt services and could supply the waiting room with magazines, television set, etc. to make patients more comfortable during their wait. Positive physician-patient interaction increased patient satisfaction more than any other provider-customer relationship. Some training could be given to patients so that their expectations became realistic and hence tended to improve their satisfaction with the service provided.

Rohini and Mahadevappa (2006) applied SERVQUAL framework and applied SERVQUAL factors in their study on Bangalore (India) hospitals. They obtained the perceptions of both the patients and the hospital management. The study concluded that there existed an overall gap between patient's perceptions and expectations and also between management's perception of patients' expectations and patient's expectations. The authors provided recommendations to fill those gaps. Rao *et al.* (2006) developed a reliable scale to measure in-patient and out-patient perceptions in India. Their study included medicine availability, medical information, staff behavior, doctor behavior and clinic infrastructure as dimensions of perceived quality in healthcare services. Das and Hammer (2007) studied the differences in doctors' competencies in government and private hospitals located in rich and poor localities in Delhi (India). The study justified the notion that public sector was performing worse than private sector by comparing the distributions of MBBS qualified public doctors with MBBS qualified private doctors. They also found that both government and private hospitals in poor areas were performing worse than the hospitals located in rich areas. Duggirala *et al.* (2008) proposed that healthcare SQ consisted of seven dimensions, namely, infrastructure, personnel quality, process of clinical care, administrative processes, safety indicators, overall experience of medical care and social responsibility.

It is seen that in healthcare services, personalization or physician – patient interaction or interpersonal care played a critical role in forming SQ judgments. Andaleeb (1998), Curry and Sinclair (2002), Otani and Kurz (2004), Pakdil and Harwood (2005) and Ramsaran-Fowdar (2008) have emphasized the criticality of soft aspects/functional quality of healthcare services while some authors namely, McGorry (1999), Carman (2000), etc. found that technical quality was the most important factor. In India, Rohini and Mahadevappa (2006) concluded that there existed an overall gap between patient's perceptions and expectations and also between management's perception of patients' expectations and patient's expectations in Indian healthcare services. Sahay (2008) asserted the need to improve customer service in Indian hospitals. All these observations indicate that there is an urgent need to raise the standards of Indian healthcare system.

The SQ literature in the context of hospitals has mostly focused on patient's and management's perspective, so far. Some of the studies investigated the gaps between the service providers' perceptions and patients' perceptions. Healthcare services, being high in credence qualities, cognitive judgment will not prevail in the patient's evaluation of service delivery. Further, in a hospital environment, patients are in a state of physiological or psychological discomfort (Duggirala *et al.*, 2008). Thus, they require the assistance of others to interact with the service providers. In India, an in-patient is always accompanied by an attendant. So, it is often these attendants who are in a good position to judge the care provided. A holistic picture of healthcare services that focuses on the attendants' needs, while providing hospital services will be extremely useful to healthcare service providers. Hence, this study aims to conceptualize SQ from the perspective of patients as well as attendants.

Some authors emphasized the importance of the patients' family members and friends in their studies. Strasser *et al.* (1995) attempted to compare the satisfaction levels of patients and their family members. The results suggested that the patients were more satisfied with the care provided than their family members and friends. They observed that the family members and friends not being the main beneficiaries of the treatment plan perceive less intensity and frequency of the care and this might have led to their dissatisfaction. Butler *et al.* (1996) wanted to find if there existed a significant difference between the perceptions of users (healthcare consumers, namely, patients) and observers (family members or friends who visit patients) with respect to hospital SQ, given the credence nature of the services. They found that there existed significant differences indeed between the perceptions of the two groups of people. Tucker and Adams (2001) studied the perceived hospital SQ from military service members, retirees and their non-military family members. Tomes and Ng (1995) included some items in their instrument about hospital staff being courteous to patients' family members. Such studies reinforce the necessity of including the perceptions of patient's friends or family members in the study. Further, the number of attendants and visitors (who visit patients for a short duration) far outnumber the number of patients in the hospital (Weiss, 2004). But they were often ignored by healthcare organizations. Rhodes *et al.* (2008) found that family members of patients in the USA hospices were satisfied if they were regularly informed about the patients' condition.

SQ and CS have been considered as two sides of the same coin. Oliver (1980) proposed that satisfaction is a function of the disconfirmation of performance from expectation. Oliver (1989) defined satisfaction as an evaluative, affective, or emotional response. So customers can evaluate the object only after they interpret the object. Hence, satisfaction is the post-purchase evaluation of products or services given the expectations before purchase (Kotler, 1991). Satisfaction is dependent on the ability of the supplier to meet the customer's norms and expectations and no matter how good the services are, customers will continually expect better services (Dwyer *et al.*, 1987; Fornell, 1992; Oliva *et al.*, 1992). While CS could be related to values and prices, SQ generally does not depend on prices (Anderson *et al.*, 1994). While SQ judgments are quite specific to the service delivered, satisfaction can be determined by a broader set of factors including those which are outside the immediate service delivery experience (e.g. his/her mood is good on that particular day). Perceptions on SQ do not depend on experiences with the service environment or service providers, while judgments for satisfaction depend on past experiences (Oliver, 1993).

Many theories have been proposed to explain CS. According to expectancy-disconfirmation theory put forth by Oliver (1980), customers purchase goods and services with pre-purchase expectations about anticipated performance. Once the product or service has been purchased and used, outcomes are compared against expectations. When the outcome matches expectations, confirmation occurs. Disconfirmation occurs when there are differences between expectations and outcomes. Satisfaction is caused by confirmation or positive disconfirmation of expectations and dissatisfaction is caused by negative disconfirmation of consumer expectations. According to personal control theory proposed by Rotter in 1966, satisfaction with one's life experience or job is related to the person's perception of psychological covariance between their actions and desired outcomes. So, in healthcare services, patients may perceive themselves as possessing more personal control over the healing process than others. Acting as a causal agent on one's own behavior might make patients more satisfied with their care than others. There are two basic models which are used to measure the satisfaction of customers, namely, transaction-specific model and cumulative satisfaction model. In transaction-specific model, CS has been modeled as a function of psychological constructs such as attitude, expectation and disconfirmation (Boulding *et al.*, 1993; Oliver, 1993), whereas, in cumulative satisfaction model, the benefits derived from product or service attributes form the primary antecedents to satisfaction (Gustaffson and Johnson, 2004). The current research makes use of personal control theory and cumulative satisfaction model to measure CS in healthcare services.

Patterson and Johnson (1993), Rust and Oliver (1994) and Taylor (1993) attempted to distinguish the two constructs. Some researchers (Cronin and Taylor, 1994; McAlexander *et al.*, 1994) have argued that consumers might not distinguish between SQ and satisfaction, since both were based on attitude formations. Despite these notions, a general agreement in the services literature has been that SQ and CS have been two distinct but closely related constructs (Dabholkar, 1996; Shemwell *et al.*, 1998). Sureshchandar *et al.* (2002b) also endorsed this view. In fact, SQ research has largely gained focus because of the notion that high SQ results in customers' satisfaction and their behavioral intentions including positive or negative word of mouth recommendations to others, revisit the provider, willingness to pay higher price, intention to switch to other providers, complaining about defective service, etc. Even though there are other antecedents to CS, namely, price, situation, personality of the buyer (Natalisa and Subroto, 1998), SQ receives special attention from the service marketers because it is within the control of the service provider, and by improving SQ, its consequence CS could be improved, which may in turn influence the buyer's intention to purchase the service.

In all the sectors, including healthcare, SQ has been established as an antecedent of CS. Pakdil and Harwood (2005) studied patient satisfaction in a pre-operative assessment clinic. They showed that patients were most dissatisfied with the waiting time and positive physician-patient interaction increased patient satisfaction more than any other provider-customer relationship. Rao *et al.* (2006) concluded that medicine availability, medical information, staff behavior and doctor behavior had significant positive influence on patient satisfaction while waiting time had negative impact on patient satisfaction. Baalbaki *et al.* (2008) found that nursing was the most influential dimension in both emergency room and in-patient encounters with respect to patient satisfaction in Lebanon hospitals. Duggirala *et al.* (2008), in their study on Indian hospitals, revealed that all the

seven dimensions of healthcare SQ, namely, infrastructure, personnel quality, process of clinical care, administrative processes, safety indicators, overall experience of medical care and social responsibility were significant predictors of patient satisfaction. Ramsaran-Fowdar (2008), in a study on private hospitals, found that “reliability, and fair and equitable treatment” was the most important SQ dimension influencing patient satisfaction in Mauritius healthcare services. They had used modified SERVQUAL scale for this purpose. Williams *et al.* (1998) determined that patient satisfaction did not improve after renovation of the emergency department of a hospital under study. They further hypothesized that satisfaction scores might improve if the goals of renovation, efficiency and privacy were met.

The literature has established the relationship between SQ and CS. The current study attempts to examine this relationship in the context of Indian healthcare services from the perspectives of patients and attendants.

3. Motivation for the current study

Healthcare delivery systems in developing countries where the resources are not in proportion to the demands placed on services of healthcare institutions, and where the possibility of resources being increased in the short term is quite different, calls for the increase in the effectiveness of the healthcare system by the efficient management of hospitals. Hospitals in developing countries absorb more resources than any other kind of recurrent government spending on health. A review of the health sector in many countries suggests that these large recurrent expenditures on hospitals involve a great waste of resources because of the technical and managerial inefficiency within hospitals (Tabish, 1998). Further, today’s buyers are better educated and more aware than in the past, as there is a mine of data available through bulletins, web sources, online repositories, health magazines, etc. Hence, delivering quality service becomes vital. India has become a preferred medical treatment destination, providing cost-effective treatment to the patients from all over the world. It is currently contributing 5.2 percent of the India’s GDP. If the services provided are improved, there is a greater chance of this percentage contribution to grow.

Further, SQ has been established to be an antecedent of CS, which is again found to influence customers’ purchase intentions. Zeithaml *et al.* (1996) revealed through an empirical study that high-service performance increased favorable behavioral intentions and decreased unfavorable behavioral intention. Hence, understanding not only the dimensions of healthcare services but also the extent of their influence of patient satisfaction gives insights to hospital managers and administrators. In Indian context, patients’ family and friends (referred to as attendants in the study) always accompany them during their hospital stay.

Attendants gain importance in the context of Indian healthcare services due to the following:

- (1) As patients are often in a state of physical or psychological discomfort (Duggirala *et al.*, 2008), it is often these attendants who are in a good position to judge the care provided.
- (2) In-depth personal interviews with the physicians in hospitals revealed that the presence of a patient’s attendant is necessary for the following reasons:
 - *Vouching for the patient’s identity.* Most Indian citizens do not have a uniform official document to reveal their identity unlike in the West, where every

citizen or resident has a valid social security number or other identification numbers. If a patient gets admitted in a critical condition, recognizing her/his identity becomes an issue in India, especially if in medico-legal cases. So, an attendant could help in vouching for the identity of the patient.

- *Responsibility in case of critical care.* Attendants have to take the responsibility of patients in case of critical care by providing undertakings. If a major surgery is to be performed on a married female patient, her husband/parents have to give an undertaking in order for the hospital authorities to proceed with the surgery.
- *Support provided to patients.* Attendants provide both physical and emotional support to the patients. In many cases, attendants generally take care of financial needs of patients, as hospitals do not allow them to possess money themselves. Attendants also act as a bridge between hospital authorities and patients. Sometimes, attendants aid the treatment process by arranging for blood required for surgery, without which, surgery cannot be performed. They also procure drugs required for treatment process in both private and government hospital setup. They carry out the function of fetching food from home/outside if food is not provided by the hospital.

In fact, in the healthcare industry, research shows that the decision-making unit likely include an initiator (family member), an influencer (physician), a decider (physician, patient/consumer or insurance), a buyer (third-party insurance or employer) and the user (patient/consumer). As a final point, additional research has shown that patient/consumer involvement in decision making related to his or her health choices is increasing as patient/consumers are exposed to an increasing number of healthcare system providers (Laffel and Blumenthal, 1989; Porter and Teisberg, 2004). As a result, healthcare delivery systems adhere to a long buying process model and are a high-involvement service. Regardless of lacking strong conceptual support, many hospital strategies have placed an increased importance on advancing their respective technical advancements as a measure of achievement. For the reasons mentioned above however, there exists a need for a greater conceptual understanding over the affects of correlating healthcare delivery system strategies with technological achievements. The framework suggested by Padma *et al.* (2009) has been used in the current study to develop and validate instruments for SQ in healthcare from the perspectives of patients as well as their attendants (see Padma *et al.*, 2009 for the comprehensive presentation of constructs and for a comprehensive comparison with the existing frameworks).

4. Objectives of the current study

In line with the motivation of the study and observations from the literature, the following are the objectives of the current study:

- to develop two comprehensive instruments to conceptualize SQ perceptions in hospitals, one from the perspective of patients and one from the perspective of attendants; and
- to analyze the relationship between SQ and CS from the perspectives of both patients and attendants.

5. Constructs in the study

This section presents the description of eight constructs used in the current study. All these eight dimensions have been measured from the perspectives of both patients and attendants. The instruments used to obtain patients' perceptions and attendants' perceptions are similar in terms of constructs and the constituent items (except for some minor differences). The same item used for measuring a factor is worded differently in both the instruments. Patients' perceptions are obtained about the quality of services offered to them whereas attendants' perceptions are obtained about the quality of services offered to patients. For example, an item in the instrument designed for patients reads as:

- nurses' care and responsiveness to you.

The same item in the instrument meant for attendants reads as:

- nurses' care and responsiveness to the patient.

The instrument proposed by Padma *et al.* (2009) has been used in the current study to measure SQ perceptions of patients and attendants. The eight dimensions of SQ for healthcare services, namely, infrastructure, personnel quality, process of clinical care, administrative procedures, safety indicators, hospital image, social responsibility, and Trustworthiness of the hospital.

Infrastructure

Infrastructure includes the tangible features of a service delivery (including equipment, appearance of the firm/facility, signage, availability of resources, etc.). It is also referred to as man-made physical environment or "servicescapes". The facilities should not only be visually appealing, but also be hygienic, particularly in healthcare service. As services are primarily intangible, customers judge the quality of services based on the tangible aspects of services. Technological capability of a hospital including equipment to test and treat various ailments is a part and parcel of the hospital infrastructure. Parasuraman *et al.* (1985), in their SERVQUAL model, used "tangibles" as a dimension of SQ. Tomes and Ng (1995) identified "physical environment" as one of the factors of hospital SQ in the USA. Andaleeb (1998), while conceptualizing SQ-stated that "facility" was a factor of SQ, in a study on the US hospitals. Reidenbach and Smallwood (1990) and Otani and Kurz (2004) used the constructs, "physical surroundings", "pleasantness of surroundings" in their studies, respectively, to denote the physical facilities and ambience. Rao *et al.* (2006) conceptualized healthcare services in terms of "clinic infrastructure", along with other dimensions. JCI (2007) has also identified "facilities management" as a key function in hospitals. Duggirala *et al.* (2008), in their study on Indian healthcare services, had also included infrastructure to be one of the dimensions of SQ.

Personnel quality

It refers to quality of all the personnel involved in delivering service, namely, doctors, nurses, paramedical, and support staff. The personnel offering service are expected to be responsive, reliable, friendly, sincere and competent by the customers. Friendly and courteous staff tend to improve patients' perceptions of the hospital. Parasuraman *et al.* (1985) made use of assurance, empathy and responsiveness dimensions to indicate the

quality of personnel. Andaleeb (1998) had three of the five dimensions, “competence of staff”, “demeanour”, and “communication” related to patient-staff interaction, which reinstates the importance of patient’s relationship with hospital employees. Hasin *et al.* (2001) and Sower *et al.* (2001) used “courtesy” and “respect and caring”, respectively, to represent personnel quality in their researches on healthcare. Otani and Kurz (2004) concluded that “nursing” was more important in improving CS and behavioral intention than other factors. Rao *et al.* (2006) also found that interpersonal skill of medical personnel was a significant predictor of patient satisfaction. Das and Hammer (2007) found that the personnel quality, particularly doctors’ qualification, was worse in government hospitals than private hospitals in India. Baalbaki *et al.* (2008) found that nursing was the most influential dimension with respect to patient satisfaction in Lebanon hospitals. Duggirala *et al.* (2008) included personnel quality to be a significant predictor of patient satisfaction.

Process of clinical care

This is the core service or primary service or technical quality of hospital service. It explains “whats” of a service including the width and depth of services. This aspect of service is taken for granted by the customers. When a hospital fails in this aspect, patients do not attach any importance to other aspects, i.e. even if the personnel are friendly in a hospital, the patient may not perceive the service to be of high quality if the doctor lacks the necessary competence and skill. Baldwin and Sohal (2003) included safety, reliability, technical ability and skills of dental practitioners in the factor “skill and ability”. Kang and James (2004) asserted that SERVQUAL model, though mentioned about the technical quality, did not incorporate it. Hence, they considered “technical quality” in their study, and defined “technical quality” as technical competence and immediate outcomes. Rose *et al.* (2004), in their research on Malaysian hospitals, revealed that technical quality was perceived to be the most important factor in both public and private hospitals. Duggirala *et al.* (2008) had also included process of clinical care as a dimension of SQ.

Administrative procedures

Administration of hospital includes the processes of admission, stay and discharge of patients. Many studies reported that patients are not happy with the long waiting times for diagnosis, treatment, etc. in the hospitals across countries. The ease of getting appointments, ambulance services, simplicity of admission and discharge, etc. all are essential in ensuring a hassle-free treatment to patients. During the whole hospitalization experience and at each “contact point”, all employees should demonstrate that they care about its patients, are careful in protecting and enhancing the hospital’s reputation, do everything to gain the patients’ confidence in the hospital and ensure that patients feel safe during their hospitalization (Boshoff and Gray, 2004). Pakdil and Harwood (2005), who studied patient satisfaction on a pre-operative assessment clinic, determined that patients were most dissatisfied with waiting time. One of the important issues of administrative processes is the delay at different stages of the patient’s hospital stay (Duggirala *et al.*, 2008). So, well-defined administrative procedures are required to make the patients’ stay in the hospital a pleasant one.

Safety indicators

Firms have to make their employees and customers feel safe and secure, because if either of these is threatened, it exerts a tremendous psychological impact on both. The safety is critical as it relates to the survival concerns, which are basic needs of individuals. A service firm failing to make their customers feel safe, loses out on everything. A hospital has to address safety critical issues in order to provide a good service because patients visit hospitals to improve their health status and thereby the quality of their life. Provision of ramps and elevators, checking for drugs causing allergic reaction in patients are some of the precautions to be taken by the hospital to avoid any crisis and enable a comfortable stay for patients. Further, the safety of customers who have special needs (e.g. use of ramps, elevators, etc.) has also to be considered. Older people (both patients and their attendants) and physically challenged people are in need of special facilities to take care of their needs. This is particularly important in healthcare services, as it deals with the survival of patients. So far, only Duggirala *et al.* (2008) seemed to have used “safety indicators” as a dimension of SQ.

Hospital image

The existing literature on SQ argues that delivering core service is a necessary but not sufficient condition for CS. Grönroos (1982) realized the role of “image” in the conceptualization of SQ, and emphasized it as a filter in the perception of SQ in addition to the technical and functional quality dimensions. The image a firm enjoys also plays a pivotal role of conveying to a customer what the firm has to offer in terms of technical and functional qualities. The image affects the expectations of the customers and hence it is important in making the customers have realistic expectations. So, even in healthcare services, the reputation enjoyed by a hospital has to be considered as an element of SQ.

Social responsibility

It is an inseparable aspect of services, although ignored by several studies. Customers not only solicit good service but also fair service from the service providers. Johnston (1997) in a study on banking services, asserted that “integrity” was a component of bank SQ. MBNQA (2007) emphasizes that social responsibility is a vital indicator of quality of service. A service firm cannot be concerned only about its profitability but also about the society, as a whole. For example, if a hospital provides free treatment to economically downtrodden people, it certainly would boost the hospital’s image and thereby improve patients’ perceptions of SQ. Duggirala *et al.* (2008), in their study on Indian healthcare service, had also emphasized on “social responsibility”.

Trustworthiness of the hospital

The trustworthiness of hospital measured by the sense of well-being he feels in the hospital, security, etc. does influence the confidence the patient has on the hospital. This will in turn play a role in the overall evaluation of service provided. Balasubramanian *et al.* (2003) considered “perceived trustworthiness” as a component of online service which could be a determinant of CS. Iyer and Muncy (2004) considered that level of trust patients had varied across patient categories and segmented the patients based on the level of the trust they had on the service provider.

Ramsaran-Fowdar (2008), while researching on Mauritian private hospitals, found that reliability, and fair and equitable treatment' was the most important SQ dimension influencing patient satisfaction.

Patient satisfaction/attendant satisfaction

The importance of CS is well researched in the context of healthcare. Andaleeb (1998) found that communication, cost, facility, competence and demeanour were the important determinants of patient satisfaction in hospital services. Pakdil and Harwood (2005), in their study on patient satisfaction in a pre-operative assessment clinic, showed that positive physician-patient interaction increased patient satisfaction more than any other provider-customer relationship. Duggirala *et al.*'s (2008) study on Indian hospital services revealed that infrastructure, personnel quality, process of clinical care, administrative processes, safety indicators, overall experience of medical care and social responsibility were significant predictors of patient satisfaction. The present study makes use of patients' overall satisfaction with the services provided for measuring this variable. Several researchers (Strasser *et al.*, 1995) have also emphasized the importance of satisfaction of patients' family members/friends in their study. Hence, the current study attempts to measure attendants' satisfaction of hospital services.

6. Research methodology

As this study aims to compare the perceptions of patients and their attendants, two similar but separate instruments, one each for patients and their attendants, have been designed. The developed instruments are administered to patients and their attendants in a paired sampling design, as proposed by Strasser *et al.* (1995), i.e. data have been gathered from each patient and his/her attendant, as a pair. Data compiled from both patients and attendants have been analyzed to gain insights into their perceptions of healthcare services and the differences in their individual perceptions have also been analyzed.

Chennai has been the first Indian city to aggressively promote medical tourism much ahead of others (*The Hindu*, 2007). Even though private hospitals are spearheading much ahead, the foundation of quality medical care in Chennai was laid by government hospitals. Most of the government hospitals now have state-of-the-art diagnostic and treatment facilities and provide specialty and super-specialty care. Data have been collected from the patients and their attendants in government and private hospitals in and around Chennai satisfying the following membership rules.

The rules of membership for the patients are as follows:

- Patients should have been admitted in a government or a private hospital within the previous six months when the study was conducted (patients recuperating at home or in-patients who were on the verge of discharging from hospitals).
- The patient should have stayed in the hospital for at least two days (considered a reasonable period for experiencing all hospital-related processes).
- For the purpose of the present study, hospitals with minimum 30 beds have been considered (some insurance companies in India prescribe certain minimum number of beds in a hospital as a qualifying criterion).

The rules of membership for the attendants are as follows:

- Attendant should have stayed with the patient in the hospital and taken care of the patient during the period of hospitalization.
- Attendant can be a family member or a relative or a friend of the patient.

For this study, the accessibility of the hospitals and time available for collecting sample data were taken into consideration before deciding the sample size. Hence, in this study we collected data from in-patients, who underwent treatment in the hospitals in and around Chennai and their attendants. Since the willingness of the respondents was also a factor to be considered, patients (and their respective attendants) were interviewed in the hospitals just before their discharge, after their treatment as well as after their discharge from hospitals. These considerations suggested that a total of around 200 respondents (about 100 in each type of hospital, viz., government and private hospitals). The actual sample size in the study is 204 patients and 204 attendants. As it is at times tedious to obtain permissions and approvals from the Indian hospitals, this study made use of convenience sampling method to gather responses from each hospital but the hospitals were selected based on their accessibility, i.e. hospitals in and around Chennai which allowed their patients and attendants to respond to the survey.

In this study, performance-only model (SERVPERF) developed by Cronin and Taylor (1992) is used to measure SQ perceptions. Cronin and Taylor (1992) proposed using only performance perceptions as a measure of SQ. The responses have been obtained through the use of a seven-point Likert scale (shown below) ranging from very high to very low. The use of seven-point Likert scale is to measure SQ in India has been advocated by Sureshchandar *et al.* (2001) and Issac *et al.* (2003). As Indian respondents tend to give the average rating mostly, the seven-point scale can be used to capture finer variation in the responses. Table I provides the Likert scale used in this study.

In the measurement scale “1” indicates very low level of performance and “7” indicates very high level of performance.

A pilot test of the questionnaire was done to test its face validity. The instrument was administered to a panel of experts made of academicians, hospital administrators and doctors. They examined the instrument for its exhaustiveness. The instrument was also administered to fellow research scholars who had been admitted in hospitals in order to evaluate for readability and representativeness of the items and to verify the clarity of the questions posed. With a few exceptions, the panel of experts and respondents felt that all questions were clear, and that the language and scale used were appropriate and suitable. Some items were found to be redundant and they were removed.

Based on the suggestions, some changes were made to the language used in a few items, and also to the layout of the questionnaire. The respondents reported that some negatively worded items were difficult to respond to as they have to change their normal way of thinking and respond in a different way when compared to majority of other items. The items that were changed are shown in Table II.

1	2	3	4	5	6	7
Very low	Low	Slightly low	Neither low nor high	Slightly high	High	Very high

Table I.
Likert scale used in the
current study

This made it easier for the respondents to provide correct and reliable information. After necessary modifications, the questionnaire was ready for final administration. The sample profile of patients and attendants in the present research are provided in Appendices 1 and 2.

7. Empirical validation of SQ constructs

As mentioned in Section 5, a total of 408 usable responses, 204 each from patients and attendants, were obtained through the questionnaire-based survey. In order to validate the instrument, reliability, validity and uni-dimensionality of the questionnaire were tested with the collected data before proceeding with further statistical analyses.

Reliability

Reliability of an item and the whole instrument refers to the degree to which similar scores are obtained for each item under consideration when repeatedly administered. It is the ability of an instrument to yield consistent results (Nunally, 1988). The most common measures of reliability are the test-retest, and internal-consistency reliability. When a single measurement instrument is administered to a group of people on one occasion, the internal-consistency method is the best for estimating reliability (Trochim, 1999). The internal-consistency is commonly measured by Cronbach’s (1951) coefficient α . The Cronbach’s α measures for all the constructs are presented in Tables III and IV. It is not calculated for single/two-item constructs, namely, patient/attendant satisfaction and attendants’/patients’ behavioral intention.

It can be observed from Table III that all Cronbach’s α values are equal to or above 0.60, which is the generally agreed upon lower limit for exploratory research (Chen and Paulraj, 2004; Gopalakrishnan, 2008). However, “safety indicators” has an α value of 0.58, which is marginally < 0.60 . Hence, the results of analysis with respect to this dimension have to be interpreted with caution. It is also seen that “safety indicators” has an α value of 0.58, which is only marginally < 0.60 . Vandamme and Leunis (1993) in their research reported α values ranging from 0.58 to 0.75. They stated that out of seven factors, three factors had an α value more than 0.70. They also attributed the low-reliability values to the existing instrument. In the current study only one factor, safety indicators, has an α value of 0.58. Even though this value is < 0.60 , it is very close to the cut-off value of 0.60. This low value may be attributed to the nature of items or nature of sample. However, the results of various analyses may be interpreted with caution with respect to this dimension.

Face validity

Validity is the extent to which the instrument measures what it is intended to measure theoretically (Carmines and Zeller, 1990). The items and the questionnaires are said to

SQ dimension	Initial version	Revised version
Administrative procedures	Waiting time to consult with doctors	Modified as: “Ease of consulting with doctors (within a reasonable waiting time)”
Process of clinical care	Delay or cancellation of your scheduled admission/surgery	Modified as: “Timeliness of your scheduled admission/surgery”
Administrative procedures	Waiting time to get diagnostic tests done	Modified as: “Ease of getting diagnostic tests done”

Table II.
List of modified items after the pilot study

Factor	Items no.	Item loadings	BFI	CFI	Alpha
Infrastructure	1	0.59	0.94	0.95	0.674
	2	0.60			
	3	0.58			
	4	0.25			
	5	0.20			
	6	0.27			
	7	0.37			
	8	0.22			
	9	0.42			
	10	0.42			
Personnel quality	1	0.55	0.95	0.96	0.816
	2	0.44			
	3	0.37			
	4	0.52			
	5	0.24			
	6	0.50			
	7	0.33			
	8	0.62			
	9	0.39			
	10	0.47			
	11	0.48			
Process of clinical care	1	0.51	0.97	0.98	0.715
	2	0.59			
	3	0.62			
	4	0.63			
	5	0.40			
	6	0.44			
Administrative procedures	1	0.20	0.86	0.87	0.613
	2	0.61			
	3	0.21			
	4	0.35			
	5	0.54			
	6	0.39			
	7	0.36			
	8	0.71			
Safety indicators	1	0.78	1.00	1.00	0.580
	2	0.47			
	3	0.80			
Hospital image	1	0.66	1.00	1.00	0.700
	2	0.32			
	3	0.71			
Social responsibility	1	0.78	0.99	1.00	0.720
	2	0.47			
	3	0.80			
Trustworthiness of hospital	1	0.29	1.00	1.00	0.718
	2	0.54			
	3	0.67			
	4	0.51			
	5	0.48			

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Table III.
SQ dimensions: patients'
perspective – item-factor
loadings and fit indices

Notes: After modifying/dropping items; acceptable limits of CFA indices: BFI > 0.85; CFI > 0.85; Cronbach's alpha > 0.6

Factor	Items no.	Item loadings	BFI	CFI	Alpha
Infrastructure	1	0.72	0.96	0.97	0.703
	2	0.68			
	3	0.69			
	4	0.47			
	5	0.63			
	6	0.54			
	7	0.44			
	8	0.64			
	9	0.56			
	10	0.38			
Personnel quality	1	0.54	0.96	0.97	0.868
	2	0.47			
	3	0.70			
	4	0.68			
	5	0.62			
	6	0.44			
	7	0.69			
	8	0.68			
	9	0.64			
	10	0.63			
	11	0.77			
Process of clinical care	1	0.77	0.99	0.99	0.768
	2	0.72			
	3	0.62			
	4	0.68			
	5	0.42			
	6	0.44			
Administrative procedures	1	0.58	0.95	0.97	0.670
	2	0.51			
	3	0.54			
	4	0.84			
	5	0.62			
	6	0.23			
	7	0.57			
	8	0.66			
Safety indicators	1	0.78	1.00	1.00	0.620
	2	0.47			
	3	0.80			
Hospital image	1	0.73	1.00	1.00	0.700
	2	0.40			
	3	0.44			
Social responsibility	1	0.71	0.99	1.00	0.681
	2	0.39			
	3	0.70			
Trustworthiness of the hospital	1	0.68	1.00	1.00	0.764
	2	0.53			
	3	0.85			
	4	0.60			
	5	0.43			

Table IV.
SQ dimensions:
attendants' perspective –
item-factor loadings and
fit indices

Notes: After modifying/dropping items; acceptable limits of CFA indices: BFI > 0.85; CFI > 0.85; Cronbach's alpha > 0.6

have face validity if they reasonably represent the perceived purpose of measurement (Kaplan and Scauzzo, 1993). In order to assess the face validity, one looks at the measure and sees whether it is a good reflection of the construct on its face. The items in the current study have been mostly chosen from the existing literature and the additional items included in the study have been examined by experts like industry practitioners (physicians and hospital administrators) and academicians. Further, the scales have also been refined using pilot study in which patients participated. All these steps ensure that the instrument possesses face validity.

Content validity

Content validity is the extent to which the instrument adequately represents the conceptual domain that it is designed to cover. Content validity can be ensured if the items representing the various constructs in an instrument are substantiated by a comprehensive review of relevant literature (Bohrnstedt, 1983). The instrument contains constructs and items from the existing literature and also others which are added in the current thesis in order to be exhaustive. Further, the pilot study also suggested changes and additions to be made and the instrument has been checked for content validity.

Unidimensionality and convergent validity

Measurement theory requires that a set of items that are developed and used for representing one factor should be statistically unidimensional. Unidimensionality is defined as the existence of one latent trait or construct underlying a set of measures (Hattie, 1985). The usefulness of items within a measure depends on the extent to which they share a common core (Nunally, 1988). The unidimensionality of the items representing each variable was tested using confirmatory factor analysis (CFA). Comparative Fit Index (CFI) computed using CFA is a good indicator of uni-dimensionality.

Convergent validity is an assessment of the consistency in measurements across multiple operationalizations (Venkatraman, 1989). When there is high correlation between a measure and other measures that are believed to measure the same construct, evidence for convergent validity is obtained (Kaplan and Scauzzo, 1993). Byrne (1994) suggested that index value of 0.90 and above for Bentler-Bonnet Fit Index (BFI) indicated convergent validity of the measurement scale.

In addition to the items that were dropped/modified after the pilot tests, some more items were dropped after analyzing the reliability and validity of the final data. A list of the dropped items and the respective reasons is presented in Table V.

In order to maintain uniformity across the instruments developed for patients and attendants, the same set of items are also included under each construct in the instrument developed to measure attendants' perceptions. Reliability (i.e. Cronbach's α) was then computed for every variable/construct. The reliability values for all the seven constructs are presented in Tables III and IV for patients' and attendants' perspectives, respectively. The values for individual variables representing these constructs are presented below. In order to analyze the uni-dimensionality and convergent validity, CFA was done on the items defining the variables/constructs and the results of it are discussed below. It can be observed that almost all the variables have BFI and CFI values above the recommended value of 0.90. Though in a few cases the value falls below 0.90, they do not fall below the minimum recommended score

of 0.85 for exploratory research. This provides further evidence of the convergent validity of the proposed instrument. Tables III and IV provide a summary of reliability and validity measures of all the constructs from patients' perspective and attendants' perspective, respectively. The items are provided along with each construct in Appendices 1 and 2.

Criterion-related validity

According to Sureshchandar *et al.* (2002a), in criterion validity, the performance of a measure is checked against some criterion. In the present study, criterion-related validity is established by correlating the scale scores with CS, for both patients' and attendants' perspectives. Pearson's correlation coefficient was calculated based on the bi-variate correlation between each SQ dimension and patient satisfaction. It is evident from Tables VI to VII that all the scales have significant positive correlations (in line with the existing literature) with patient satisfaction as well as attendant satisfaction. Thus, criterion-related validity has been established for both the instruments.

8. Influence of SQ on CS

One of the main objectives of the present study pertains to analyzing the relationship between SQ and CS. This section empirically tests the relationship between SQ and CS from patients' and attendants' perspectives. The following hypotheses are tested:

Table V.
Summary of dropped items

Construct	Item	Remarks
Infrastructure	Presence of signs in prominent places about patients' well-being and preventive measures to increase health awareness among patients and visitors (e.g. advertisements about effects of tobacco, cleanliness of water, etc.)	Dropped due to low reliability
Process of clinical care	Interactions among doctors of appropriate specialties with regard to (i.e. in respect of) your medical care	Dropped due to low reliability

Table VI.
Correlation between SQ dimensions and patient satisfaction

SQ dimensions	Patient satisfaction
Infrastructure	0.35*
Personnel quality	0.46**
Process of clinical care	0.32**
Administrative procedures	0.30**
Safety indicators	0.16*
Hospital image	0.23**
Social responsibility	0.22**
Trustworthiness of the hospital	0.42*

Note: Significance at: *0.05 and **0.01 levels

- H1. There is a significant influence of SQ dimensions (as perceived by patients) on patient satisfaction.
- H2. There is a significant influence of SQ dimensions (as perceived by attendants) on attendant satisfaction.

Table VIII shows the results for H1. A multiple regression analysis was performed to determine the impact of SQ dimensions on patient satisfaction. The regression model is also presented in equation (1). It is evident from *F*-value shown in Table VIII that the regression model is significant, and that personnel quality, clinical care, image and trustworthiness significantly influenced patient satisfaction.

Patient satisfaction can be mathematically expressed as follows:

$$\begin{aligned} \text{Patient satisfaction} = & 0.29 \times \text{Personnel quality} + 0.16 \times \text{Process of clinical care} \\ & + 0.20 \times \text{Trustworthiness of the hospital} \\ & + 0.20 \times \text{Hospital image} \end{aligned} \quad (1)$$

This finding is similar to most studies (Andaleeb, 1998; Hasin *et al.*, 2001; Otani and Kurz, 2004; Rao *et al.*, 2006; Baalbaki *et al.*, 2008) in the existing literature in healthcare services, which revealed that interpersonal interaction between hospital staff and patients was the most important factor influencing patient satisfaction. This finding also is a valuable input for hospital administrators so as to understand and analyze the

SQ dimensions	Attendant satisfaction
Infrastructure	0.56**
Personnel quality	0.56**
Process of clinical care	0.46**
Administrative procedures	0.52**
Safety indicators	0.47**
Hospital image	0.38**
Social responsibility	0.35**
Trustworthiness of the hospital	0.53**

Table VII.
Correlation between SQ
dimensions and attendant
satisfaction

Note: Significance at: *0.05 and **0.01 levels

Independent variables	Std. beta coefficient	<i>t</i> -value	<i>F</i> -value	Adjusted <i>R</i> ²
Infrastructure	0.12	1.56	9.14**	0.24
Personnel quality	0.29	3.19**		
Process of clinical care	0.16	2.19*		
Administrative procedures	0.02	0.37		
Safety indicators	0.009	0.13		
Hospital image	0.20	2.38*		
Social responsibility	0.01	0.14		
Trustworthiness of the hospital	0.20	2.38*		

Table VIII.
Influence of SQ
dimensions on patient
satisfaction

Note: Significance at: *0.05 and **0.01 levels

sources of satisfaction and dissatisfaction. The low-adjusted R^2 -value shows that the finding needs further investigation. In-depth interviews and other qualitative methods could be employed to gather more insights. This result also indicates that there may be other variables which could have been neglected by the current study in predicting satisfaction.

A multiple regression of attendant satisfaction on SQ dimensions (as perceived by attendants) to determine the impact of SQ dimensions on attendant satisfaction was done. Table IX shows the result for hypotheses set under $H2$. From the table, it is observed that the regression model is significant (as seen from significant F -value).

It is inferred from Table IX that infrastructure, personnel quality and administrative procedures significantly impact attendant satisfaction. In order to gain attendant satisfaction, service providers should not only focus on augmenting infrastructure facilities but also on adequately training personnel and streamlining administrative processes. This observation is not entirely reflected in the factors of importance identified by patients. This difference can be attributed to difference in expectations of patients and attendants. A similar finding has been reported by Strasser *et al.* (1995) who asserted that patients and their family members perceived hospital services differently due to differential cognitive exposure (meaning patients tend to perceive the treatment and stimuli directed towards them in a typical healthcare system). Thus, attendant satisfaction can be mathematically expressed as shown in equation (2):

$$\begin{aligned} \text{Attendant satisfaction} = & 0.20 \times \text{Infrastructure} + 0.22 \times \text{Personnel quality} + 0.16 \\ & \times \text{Process of clinical care} + 0.18 \\ & \times \text{Administrative procedures} \end{aligned} \quad (2)$$

A comparison of Tables VIII and IX shows that the regression co-efficient of infrastructure is 0.12 for patients whereas it is 0.20 for attendants. Patients give less importance to infrastructure than attendants; they assign high level of importance to clinical care which is evident from a co-efficient value of 0.16 when compared to 0.009 assigned by attendants. Personnel quality with a co-efficient value of 0.29 and 0.22 from patients' and attendants' perspectives is perceived as significant by both patients and attendants. Further, "administrative procedures" has a β value of 0.02 in-patients' perceptions whereas they have a β co-efficient of 0.18 in attendants' perceptions. This difference underscores the nature of unique role played by attendants in Indian hospitals. They take care of administrative activities like admission, discharge, etc.

Independent variables	Std. beta coefficient	<i>t</i> -value	<i>F</i> -value	Adjusted R^2
Infrastructure	0.20	2.32*	17.47**	0.39
Personnel quality	0.22	2.75**		
Process of clinical care	0.009	0.10		
Administrative procedures	0.18	2.17*		
Safety indicators	0.03	0.42		
Hospital image	-0.008	-0.10		
Social responsibility	0.02	0.40		
Trustworthiness of the hospital	0.10	1.18		

Note: Significance at: *0.05 and **0.01 levels

Table IX.
Influence of SQ
dimensions on attendant
satisfaction

which, patients are not usually part of, because of their physical or physiological condition. The standardized β co-efficients of 0.009 and 0.03, respectively, for safety indicators from patients' and attendants' perceptions shows that attendants more keenly observe the safety measures provided by hospitals than patients. Image has a co-efficient of 0.20 and -0.008 in patients' and attendants' perceptions, which shows that patients are satisfied if they get treated in reputed hospitals and image is a significant predictor of patient satisfaction. Though image did not turn out to be a significant predictor in case of attendants, negative β co-efficient indicated that it was perceived to be in poor light by attendants. A separate regression analysis for government and private hospitals would give more insights on this finding. Social responsibility co-efficients of 0.01 and 0.02 show that even though social responsibility is strongly associated with patient satisfaction/attendant satisfaction (as evident from Tables VI and VII), it is not a predictor of either of them. The β value of 0.20 for "trustworthiness" for patients' perceptions shows that if hospital is able to instill trust and confidence in patients, it can satisfy patients; while for attendants the coefficient is 0.10, and it indicates that attendants attribute relatively less importance to this factor.

Further, personnel quality was found to be a significant in case of both patients and attendants; whereas treatment procedure, image and trust were important from patients' perspective and infrastructure and administrative procedures were vital from attendants' perspective. This is quite logical as patients and attendants are subject to different set of hospital stimuli, i.e. patients undergo treatment processes while attendants take care of administrative procedures.

As mentioned above, Tables X and XI provide the regression result for government and private hospitals, respectively, from attendants' perspective. From Tables X to XI, it is observed that dimensions influencing the satisfaction of private hospital attendants are different from those that impact satisfaction of attendants in government hospitals. Private hospital attendants did not have a good opinion of the hospital, which reflected in image dimension. This result could be attributed to very high-treatment costs or very high expectations of attendants. Further, standardized β values for infrastructure and personnel quality are very low for government hospitals which show the poor facilities and services offered. No single SQ dimension appears to have a significant impact on attendant satisfaction in government hospitals whereas in private hospitals, infrastructure and personnel quality have significantly impacted attendant satisfaction.

Nevertheless, we provide regression results for further discussion on patient satisfaction in private and government hospitals (Tables XII and XIII). Clinical care,

Independent variables	Std. beta coefficient	<i>t</i> -value	<i>F</i> -value	Adjusted <i>R</i> ²
Infrastructure	0.007	0.04	4.10**	0.18
Personnel quality	0.059	0.39		
Process of clinical care	0.028	0.22		
Administrative procedures	0.124	0.87		
Safety indicators	0.21	1.48		
Hospital image	0.12	0.97		
Social responsibility	0.12	1.05		
Trustworthiness of the hospital	0.07	0.54		

Note: Significance at: *0.05 and **0.01 levels

Table X.
Influence of SQ
dimensions on attendant
satisfaction: government
hospitals

administrative procedures, safety indicators and trustworthiness significantly impact patient satisfaction in government hospitals. Government hospitals in India are known to have well-qualified physicians who can offer world-class treatment; in case of emergencies too, government hospitals have much easier and legally amenable procedures for admission. It is an interesting observation that safety measures in government hospitals influence patient satisfaction, which could be attributed to the presence of various facilities like ramp, elevator, etc. In private hospitals, infrastructure, image and trustworthiness are the significant predictors of patient satisfaction. Patients in private hospitals expect good infrastructure facilities unlike government hospital

Table XI.
Influence of SQ
dimensions on attendant
satisfaction: private
hospitals

Independent variables	Std. β coefficient	<i>t</i> -value	<i>F</i> -value	Adjusted R^2
Infrastructure	0.47	3.20 **	5.97 **	0.30
Personnel quality	0.20	1.25 **		
Process of clinical care	0.005	0.03		
Administrative procedures	0.08	0.67		
Safety indicators	0.15	0.97		
Hospital image	-0.129	-1.13		
Social responsibility	0.10	0.95		
Trustworthiness of the hospital	0.13	0.86		

Note: Significance at: *0.05 and **0.01 levels

Table XII.
Influence of SQ
dimensions on patient
satisfaction: government
hospitals

Independent variables	Std. β coefficient	<i>t</i> -value	<i>F</i> -value	Adjusted R^2
Infrastructure	-0.042	-0.39	7.70 **	0.32
Personnel quality	-0.002	-0.019		
Process of clinical care	0.35	3.59 **		
Administrative procedures	0.20	2.09 **		
Safety indicators	0.23	2.86 **		
Hospital image	-0.16	-1.32		
Social responsibility	0.04	0.58		
Trustworthiness of the hospital	0.32	3.09 **		

Note: Significance at: *0.05 and **0.01 levels

Table XIII.
Influence of SQ
dimensions on patient
satisfaction: private
hospitals

Independent variables	Std. β coefficient	<i>t</i> -value	<i>F</i> -value	Adjusted R^2
Infrastructure	0.24	2.10 **	7.33 **	0.35
Personnel quality	0.10	0.61		
Process of clinical care	-0.083	-0.79		
Administrative procedures	-0.035	-0.32		
Safety indicators	-0.14	-1.25		
Hospital image	0.30	2.40 **		
Social responsibility	-0.016	-0.17		
Trustworthiness of the hospital	0.55	4.45 **		

Note: Significance at: *0.05 and **0.01 levels

patients; they also select reputed hospitals. Trustworthiness is found to impact patient satisfaction in both government and private hospitals. Thus, Tables XII and XIII have provided insights on patient satisfaction in both the type of hospitals.

9. Summary and conclusions

The present study has validated SQ as an eight-dimensional framework. For this purpose, this paper has presented an instrument to identify the dimensions of SQ from the perspective of patients. An instrument to identify the dimensions of SQ from attendants' perspective has also been developed possibly for the first time. It has also analyzed the relationship between SQ and CS in healthcare services, from patients' and attendants' perspectives. A multiple regression has been done to find the influence of SQ dimensions on patient satisfaction/attendant satisfaction.

Some of the major findings of the study are summarized as follows:

- Personnel quality had the highest correlation with CS in case of both patients and attendants, indicating its importance in the context of hospital services.
- Personnel quality has emerged as a significant predictor of CS in both patients' and attendants' perceptions. This finding shows that patients and attendants treat the interpersonal aspect of care as the most important one as they cannot evaluate the technical quality of healthcare services.
- Among other factors, patient satisfaction is impacted by clinical care, image and trustworthiness of hospitals while attendant satisfaction was influenced by infrastructure and administrative procedures. This result reveals that service providers have to understand the needs of both patients and attendants in order to gather a holistic view of their services.
- Further, no single SQ dimension impacted attendant satisfaction significantly in government hospitals whereas in private hospitals, infrastructure and personnel quality significantly impacted attendant satisfaction. It was also noted that private hospital attendants did not have a good opinion of the hospital, which reflected in image dimension.
- Clinical care, administrative procedures, safety indicators and trustworthiness significantly impact patient satisfaction in government hospitals. In private hospitals, infrastructure, image and trustworthiness are the significant predictors of patient satisfaction. Government hospitals in India are known to provide well-qualified physicians, and private hospitals are preferred for their infrastructure facilities.

The multiple regression analyses on patient satisfaction and attendant satisfaction have provided a holistic view of Indian healthcare services. The findings also have a number of implications for hospital administrators. Attendants are important stakeholders because they act as surrogate patients as well as act as care-givers. The finding that personnel quality emerged as an important predictor of CS from both patients' and attendants' perspectives agrees with the existing literature in healthcare as well as other services. Different factors impacted the satisfaction levels of patients and attendants. While personnel quality, clinical care, image and trustworthiness significantly influenced patient satisfaction, it is found that infrastructure, personnel quality and administrative procedures significantly impacted attendant satisfaction. Service

providers have to take cognizance of these differences, while catering to the needs of these customers.

Finally, healthcare managers have to consider healthcare delivery as a network event rather than as an isolated encounter by involving patients' family/friends in the care. Managers can also focus on budget neutral approaches for the factors which have little or no impact on satisfaction. Reducing negative word of mouth can have significant bearing on the very business model and financials of hospitals.

The findings of this study would enable the hospital administrators to benchmark their services with other hospitals. Future studies may extend the study scope to include a larger sample. Further, differences in the perceptions of patients and attendants and their satisfaction levels could provide more insights into Indian hospital services. Future research could also attempt to investigate the influence of family and friends on patients, who are the primary customers of healthcare services. The current study has considered only the service receivers' perceptions. Future studies could gather data on hospital service providers' perceptions and arrive at a Gaps-Model for Indian hospitals.

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Appendix 1. An instrument to measure hospital SQ: patients' perspective

This section provides the items which measure the variables described in Section 5 from patients' perspective:

(1) Infrastructure:

- cleanliness and comfort (e.g. well-ventilated, with minimal noise level) of your ward-room and toilet;
- adequacy of overall security prevalent in the hospital;
- level of availability of required drugs in time;
- level of availability of required blood in time;
- level of availability of doctors and nurses, as and when required in your ward;
- level of availability of medical equipment in proper working condition;
- timely and hygienic food supplied to wards and rooms;
- level of availability of life-support facilities to manage any sudden deterioration in health condition (e.g. ambulance services, ventilator, etc.);
- good house-keeping facilities (e.g. pillows, buckets, mugs, dressing material, etc.); and
- extent to which physical facilities and infrastructure in the hospital are visually appealing.

(2) Personnel quality:

- courtesy shown by the hospital administrative staff to you;
- nurses' care and responsiveness to you;
- courtesy shown by the hospital management to your visitors;
- punctuality of doctors while conducting ward rounds;
- competency and skill of doctors;
- competency and skill of paramedical and support staff;
- courtesy and attentiveness shown by nurses to you;
- teamwork demonstrated by doctors and nursing staff;
- doctors' friendly and caring attitude with due understanding of your feelings and needs;
- interactions among doctors of appropriate specialties with regard to (i.e. in respect of) your medical care;
- extent to which the hospital staff addressed your concerns and requirements with understanding and caring attitude; and
- courtesy shown by the hospital management to your visitors.

(3) Process of clinical care:

- medical advice and instructions provided by doctors at the time of your discharge;
- fruitfulness of the medical treatment received by you;
- correct assessment of your health condition by doctors;
- explanation offered by the doctor about treatment procedures and outcomes;
- information and appraisal provided by doctors about your health, medical tests and treatment procedures; and
- promptness of handling unforeseen/unexpected complications (arising in the process of medical/surgical treatment) by the medical team.

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- (4) Administrative procedures:
- ease of consulting with doctors (within a reasonable waiting time);
 - prompt, simple and clear admission processes and procedures;
 - ease of getting diagnostic tests done;
 - simplified administrative procedures with respect to bill payment and discharge;
 - enforcement of visiting policy (e.g. visiting hours);
 - clear information and instructions provided by the hospital administration to you about hospital rules and procedures;
 - assistance provided to you by the staff in arranging for additional care or services (e.g. physiotherapy); and
 - timeliness of your scheduled admission/surgery.
- (5) Safety measures:
- adequacy of hygienic care and procedures (e.g. wearing gloves) followed by the hospital personnel;
 - infection-free environment/treatment provided by the hospital; and
 - presence of safety and comfort measures (e.g. handrails in aisles, ramps designed for wheelchairs) in the hospital.
- (6) Hospital image:
- sincerity, honesty and ethics followed by the hospital in providing medical services to you;
 - reputation enjoyed by the hospital; and
 - investment in new technologies and innovative practices by the hospital.
- (7) Social responsibility:
- fair medical treatment provided to you by the hospital;
 - provision of medical services with nominal cost to the needy patients; and
 - ethical principles followed by the hospital in delivering medical care to patients among different segments in the society.
- (8) Trustworthiness of the hospital:
- your level of confidence in the doctors who treated you;
 - presence of correct, accurate and reliable billing system in the hospital;
 - hospital provided services as promised and on time;
 - extent to which the services, functioning and administration of the hospital are credible; and
 - maintenance of patient privacy and confidentiality by the hospital.

Appendix 2. An instrument to measure hospital SQ: attendants' perspective

This section provides the items which measure the variables described in Section 5, from attendants' perspective:

- (1) Infrastructure:
- cleanliness and comfort (e.g. well-ventilated, with minimal noise level) of your ward-room and toilet;
 - adequacy of overall security prevalent in the hospital;

- level of availability of required drugs in time;
 - level of availability of required blood in time;
 - level of availability of doctors and nurses, as and when required in patient's ward;
 - level of availability of medical equipment in proper working condition;
 - timely and hygienic food supplied to wards and rooms;
 - level of availability of life-support facilities to manage any sudden deterioration in patient's health condition (e.g. ambulance services, ventilator, etc.);
 - good house-keeping facilities (e.g. pillows, buckets, mugs, dressing material, etc.); and
 - extent to which physical facilities and infrastructure in the hospital are visually appealing.
- (2) Personnel quality:
- courtesy shown by the hospital administrative staff to the patient;
 - nurses' care and responsiveness to the patient;
 - courtesy shown by the hospital management to the patient's visitors;
 - punctuality of doctors while conducting ward rounds;
 - competency and skill of doctors;
 - competency and skill of paramedical and support staff;
 - courtesy and attentiveness shown by nurses to the patient;
 - teamwork demonstrated by doctors and nursing staff;
 - doctors' friendly and caring attitude with due understanding of the patient's feelings and needs;
 - interactions among doctors of appropriate specialties with regard to (i.e. in respect of) the patient's medical care;
 - extent to which the hospital staff addressed the patient's concerns and requirements with understanding and caring attitude; and
 - courtesy shown by the hospital management to the patient's visitors.
- (3) Process of clinical care:
- medical advice and instructions provided by doctors at the time of the patient's discharge;
 - fruitfulness of the medical treatment received by the patient;
 - correct assessment of the patient health condition by doctors;
 - explanation offered by the doctor about treatment procedures and outcomes;
 - information and appraisal provided by doctors about the patient's health, medical tests and treatment procedures; and
 - promptness of handling unforeseen/unexpected complications (arising in the process of medical/surgical treatment) by the medical team.
- (4) Administrative procedures:
- ease of consulting with doctors (within a reasonable waiting time);
 - prompt, simple and clear admission processes and procedures;
 - ease of getting diagnostic tests done;
 - simplified administrative procedures with respect to bill payment and discharge;
 - enforcement of visiting policy (e.g. visiting hours);

- clear information and instructions provided by the hospital administration to the patient about hospital rules and procedures;
 - assistance provided to the patient by the staff in arranging for additional care or services (e.g. physiotherapy); and
 - timeliness of the patient's scheduled admission/surgery.
- (5) Safety measures:
- adequacy of hygienic care and procedures (e.g. wearing gloves) followed by the hospital personnel;
 - infection-free environment/treatment provided by the hospital; and
 - presence of safety and comfort measures (e.g. handrails in aisles, ramps designed for wheelchairs) in the hospital.
- (6) Hospital image:
- sincerity, honesty and ethics followed by the hospital in providing medical services to the patient;
 - reputation enjoyed by the hospital; and
 - investment in new technologies and innovative practices by the hospital.
- (7) Social responsibility:
- fair medical treatment provided to the patient by the hospital;
 - provision of medical services with nominal cost to the needy patients; and
 - ethical principles followed by the hospital in delivering medical care to patients among different segments in the society.
- (8) Trustworthiness of the hospital:
- the patient's level of confidence in the doctors who treated him/her;
 - presence of correct, accurate and reliable billing system in the hospital;
 - hospital provided services as promised and on time;
 - extent to which the services, functioning and administration of the hospital are credible; and
 - maintenance of patient privacy and confidentiality by the hospital.

Notes: All the eight dimensions of SQ are common to both patients' and attendants' perspectives. In the case of attendants, the items have been rephrased appropriately to reflect attendant's perception.

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