

# Managing Customer Perceived Service Quality in Private Healthcare Sector in India

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in

## Management

by

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Under the supervision of

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This is to certify that the work presented in the dissertation entitled “*Managing Customer Perceived Service Quality in Private Healthcare Sector in India*” submitted by *Rama Koteshwara Rao Kondasani*, Roll No. 512SM303, is a record of original research carried out by him under my supervision and guidance in partial fulfilment of the requirements of the degree of *Doctor of Philosophy in Management*. Neither this dissertation nor any part of it has been submitted earlier for any degree or diploma to any institute or university in India or abroad

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This thesis is dedicated to my father  
Late Prabhakara Rao  
&  
all who have inspired me.

## **Declaration of Originality**

I, Rama Koteswara Rao Kondasani, Roll Number 512SM303 hereby declare that this dissertation entitled “*Managing Customer Perceived Service Quality in Private Sector in India*” represents my original work carried out as a doctoral student of NIT Rourkela and, to the best of my knowledge, it contains no material previously published or written by another person, not any material presented for the award of any other degree or diploma of NITR Rourkela or any other institution. Any contribution made to this research by others, with whom I have worked at NIT Rourkela or elsewhere, is explicitly acknowledged in the dissertation. Works of others cited in this dissertation have been duly acknowledged under the section “Bibliography”. I have also submitted my original research records to the scrutiny committee for evaluation of my dissertation.

I am fully aware that in case of any non-compliance detected in future, the senate of NIT Rourkela may withdraw the degree awarded to me on the basis of the present dissertation.

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**(Rama Koteswara Rao Kondasani)**

## **Abstract**

Economic development and superior health care are so closely related that it is impossible to achieve one without the other. While the economic development in India is gaining momentum over the past few decades, our health system is at cross roads today. In this regard, health and health care need to be distinguished from each other for no better reason than that the former is often incorrectly seen as a direct function of the later. Indian healthcare sector is no longer limited to care rendered by or financed by government sector alone but recent time has seen massive participation of private players. At the same time superior service quality in private health care sector has been a major concern as customers have to pay a huge amount of money and effort to avail the services. The major problem in managing service quality lies in its heavy reliance on technical clinical criteria and the absence of ‘customers view’ on the services provided. Thus our main objective is to analyze perceived service quality, customer satisfaction and behavioural intention and looked at the most preferred private healthcare setting as perceived by Indian customers and the reasons thereof. At the same time we investigated and prioritized the diverse factors affecting perceived service quality and value in Indian private healthcare sector.

The study uses both probability and non-probability sampling techniques for choosing the hospitals and respondents. Simple random sampling is used for availing respondents’ opinion on the subject whereas convenience and judgmental sampling is used for selection of hospitals. The sample size for respondents is determined by Hair et al., 2003 formula and found to be 384. However as increasing the sample size will reduce the sampling error we have finalized a sample size of 526 from twelve private hospitals of Odisha, Andhra Pradesh and Telangana. Analytical Hierarchy Process (AHP) was used to rank order of preferred healthcare setting with respect to the service quality dimensions and relative standings of every service provider with respect to its competitors. For decision making statistical tool such as AHP analysis, Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Modeling (SEM), RIDIT analysis and GREY Relational Analysis (GRA) were used. The exploratory factor analysis was used to identify the underlying dimensions of customer perceived service quality (CPSQ) and customer perceived value (CPV) & confirmatory factor analysis (CFA) was used to confirm the factor structure and validate EFA results. Finally, the structural equation modeling (SEM) is employed to examine the hypothesized relationships. After that an attempt was made to find out the priorities dimensions of perceived service

quality and perceived value using RIDIT & Grey analysis. The results of the research may be useful to service providers and healthcare managers for better service performance and maintain long term sustainability in the competitive environment in private healthcare sector. The results may provide insight to healthcare managers as to how they can improve their service quality in order to match customer expectation and improve hospital performance.

***Keywords: Perceived service quality; perceived value; loyalty; behavioural intention; Indian private healthcare.***



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## GLOSSARY OF TERMS

Abbreviations	Full Form
AFFOR	Affordability
ANOVA	Analysis of Variance
AV	Acquisition Value
AHP	Analytic Hierarchy Process
AVE	Average Variance Explained
BI	Behavioural Intention
CAGR	Cumulative Average Growth Rate
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CRI	Consistency Ratio Index
CL	Customer Loyalty
COMM	Communication
CONS	Consistency
CPSQ	Customer Perceived service quality
CPV	Customer Perceived value
CR	Consistency Ratio
CS	Customer Satisfaction
EMP	Empathy
EFA	Exploratory Factor Analysis
EFF	Efficiency
FV	Functional Value
GDP	Gross Domestic Product
GFI	Goodness of Fit Index
HOSPQUAL	Hospital Quality



ISM	Interpretative Structural Modelling
KMO	Kaiser–Meyer–Olkins
LS	Least Squares
MCDM	Multi criteria Decision Making
MoHFW	Ministry of Health and Family Welfare
NITI Aayog	National Institution for Transforming India Aayog, India
NRHM	National Rural Health Mission
NUHM	National Urban Health Mission
PCA	Principal Component Analysis
PE	Physical Environment
PWC	Pricewaterhousecoopers
RIDIT	Relatively Identified Distribution
RI	Random Consistency Index
REL & RES	Reliability & Responsiveness
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Modelling
SPSS	Statistical Package for the Social Sciences
SERVQUAL	Service Quality
SV	Social Value
SWOT	Strength, weaknesses, opportunities and threats
TIM	Timeliness
TQM	Total Quality Management
TRAN	Transparency
TV	Transaction Value
WHO	World Health Organization
1 US Dollar= 66.85 Indian Rupee as on 27.10.2016	

## **Chapter 1**

# **Background and rationale for research**

### **1.1 Introduction**

The improvement of health of a country's population is the outcome of its improved economy and vice versa. This is true because improvement of the citizen's health can be directly related to positive economic growth as more number of healthy people will be engaged to conduct effective activities in the workforce. At the same time superior healthcare also affect quality of life more than any other service sector (Parasuraman et al., 1988; Berry & Bendapudi, 2007; Padma et al., 2010). In today's scenario, people around the world are healthier, wealthier and live longer than three decades ago. Noticeable improvements have taken place in access to clean water, proper sanitation and healthcare facilities. The rapidly growing middle-class, with its increasing purchasing power, has created a very well documented growth in the demand for healthcare services in emerging markets especially like India. In India, changes in demographic and socio-cultural environment, improved health awareness and information technology have considerably changed the outlook of healthcare sector. As customers are more aware and educated, quality of healthcare has become a vital feature in Indian healthcare industry of late. The call of the hour is to continuously improve and manage the service quality but cost cutting continues to be a significant issue that majority of healthcare providers face in India (Padma et al., 2010). While both public and private healthcare sector has priority of increasing access while minimizing costs, they try hard to achieve goals without letting the quality suffer.

As the Indian health care sector gets fiercely competitive, health care practitioners and academic researchers are increasingly interested in exploring how customers perceive the quality before building up their satisfaction levels and generating behavioural intentions (Murti, 2013). Superior service quality is increasingly realized by the healthcare professionals as a tool to strengthen their competitive position. Customer based determinants and perceptions of service quality, therefore, play an important role when choosing a hospital (Lim, 2000). In India, the public healthcare sector is owned by the government and is highly subsidized, but the quality of care, personnel and facilities is far from satisfactory. The Govt of India has initiated number of measures and programs to

bring back the sector into the growth track by enhancing the budgetary allocation to 2.5% of the Gross Domestic Product (World Bank Report, 2016) but those are found to be too little and too late. Customers with rising disposable income are no longer having faith in public healthcare system and are willing to migrate to private healthcare sector which is more professional, technology savvy and trustworthy. In the year 2005, the private healthcare providers' share to the total share was 66%, but in 2015 it has risen to 81% (FICCI report, 2015). However there are enough loopholes in the private healthcare sector that is yet to be plugged. The most important parameter being managing customer perceived service quality which lead to loyalty and ultimately favourable behavioural intentions.

Quality of healthcare services has become a primary concern for customers particularly in private healthcare as customers pay significant amount of money to avail services. So it is imperative for service providers to empathize the importance of superior service quality that will satisfy and retain more customers (Arasli et al., 2008; Duggirala et al., 2008). It has been observed that the hospitals that have failed to deliver quality services and satisfaction on a continuous basis ultimately invites loss in business (Buzzell and Gale, 1987; Phillips et al., 198). That is why customer satisfaction is regarded as the prime determinant that leads to sustainable prosperity for the organization (Anthanassopoulos et al., 2001). Satisfied customers serve as ambassador of the hospitals as they not only remain loyal but also are more than willing to recommend others to avail the services (Bitner, 1996). As consumers are more connected now, they are well informed and keen to take accountability for their own health and are more conscious about the hospitals service quality. This has led the customers to form higher expectation as well as ask for reliable, accurate, error free and vital information which was not sought before (Brady and Cronin, 2001). As customer satisfaction may result in customer loyalty and which may lead to favourable behavioural intention, it is very important to study the interaction and relationships for the greater benefit and welfare of the community and beyond.

Despite acknowledgment from global researchers, limited studies have appraised customer's perception of healthcare quality in the Indian private healthcare context. The number of studies that have been carried out on the subject of perceived service quality; customer perceived value and satisfaction in healthcare is indicative of the importance associated to the subject. However, empirical investigations affirming the relationship between all these variables are still underexplored. Certain degree of uncertainty exists

regarding validity and reliability of the research instrument employed in earlier studies. The paucity in the understanding of customers' service quality perceptions of private healthcare in India stimulates new research avenues. Critical evaluation of customers' perceived service quality can assist the private hospitals for delivering meliorated overall service experience which will lead to customer satisfaction and behavioural intention to build long-term relationships with their customers.

## **1.2 Service quality issues in healthcare**

Quality has been much talked about by researchers from the different arena. The ecumenical definition of quality according to the American Society of Quality is "a subjective term for which each person has his/her definition. In technical usage, quality can have two meanings, a) the characteristics of a product or service that bear on its ability to satisfy stated or implied needs and b) a product or service free of deficiencies." (Bemowski, 1992). Reeves & Bednar (1994) identified the roots of quality as excellence, value, conformance to specifications, and meeting and/or exceeding customer expectations." The multidimensional nature of quality makes it difficult to carry out assessments in the true sense. Also, the operationalization of quality dimensions especially in the service sector becomes difficult due to the differences between product and service characteristics. The distinct service characteristics of heterogeneity, intangibility and inseparability make quality more abstract and elusive concept.

In the context of healthcare services, quality refers "the degree to which health services for individuals and populations enhance the likelihood of desired health outcomes and are consistent with current professional knowledge" (Institute of Medicine, 2001). Quality dimensions can be categorized into two broad headings: functional quality and technical quality (Gronroos, 1984). Technical quality refers to the precision of the diagnostic treatments and procedures or the conformance to medical specifications. Functional quality relates to the means and ways in which the healthcare service is delivered to the customers i.e. patients (Lam, 1997). Prior researchers have shown that technical quality is not the accurate measure for evaluation of service quality encounter mainly because most patients don't have requisite knowledge about diagnostic practices and therapeutic intervention methods (Bowers et al., 1994; Ware & Synder, 1975). Hence, the bulk of quality evaluation from the customers' perspective is grounded on environmental and interpersonal factors, which healthcare professionals have always viewed as less important. A body of researchers (Barnes & Mowatt, 1986; Brown and

Swartz, 1989; Cronin & Taylor, 1994; Camilleri & O'Callaghan, 1998) has noted that customers' evaluation of healthcare quality depends mainly on functional aspects of infrastructural facilities, front-desk interactions, ease of medical care access rather than hard-to appraise technical aspects of service delivery process.

Generally customers cannot evaluate technical quality of healthcare services correctly and as these services are principal component in credence qualities (Zeithaml & Bitner, 2003), functional quality is often treated as the main determinant of customers' perceived quality (Donabedian, 1980). In the literature there is enough support to propose that perceived quality is the single most vital element impacting customers' perceptions of value which ultimately affects customer intention to avail the services.

### **1.3 Perceived service quality and customer satisfaction**

Customer perceived service quality and customer satisfaction is equated by researchers in the past in diverse contexts. The five service quality dimensions as suggested by Parasuraman et al. (1988) was used to measure customer satisfaction by many researchers like Howat et al. (1996). The fundamental basis of the service quality model is borrowed from the expectancy-disconfirmation paradigm which defines service quality as the difference or gap between customer expectation of service and customer perception of service (Parasuraman et al., 1988). It also focuses on the understanding of customer satisfaction as a process of matching or performing better than the customer expectation. However as the subject was further explored in various other dimensions it was felt by researchers that actually both customer satisfaction and perceived quality are distinctive construct and equating may be a concern. The argument was customer perceived service quality is generally assessed by the real service performance with respect to service attributes for a particular context; however customer satisfaction is evaluated by an individual customer's cumulative service experience which is a superset of service quality (Oliver, 1993).

Customer satisfaction therefore is not only dependent on perceived service quality but also other factors like customers' state of mind, social interactions, and other subjective factors (Rust and Oliver, 1994). In healthcare sector superior service quality may or may not produce customer satisfaction if there are negative emotions generated while interacting with service personnel or the service encounter was disturbing. Crompton and Love (1995) proved that that perceived service quality and customer satisfaction as constructs are more likely to be correlated significantly and positively, but

the likeliness of the equation to be linear is less. In majority of the literature related to service quality researchers have agreed on the uniqueness and definitions of perceived quality and customer satisfaction whereas their causal relationship is not resolved. There are two schools of thought. As one group of researchers' (Bitner, 1990; Bolton & Drew, 1991) argument is based on the premise that customer satisfaction is antecedent of customer perceived service quality and mediated by customers' expectation and assessment of service. Contrary to this the other school of thought says that both customers' perceived quality and customer satisfaction are reciprocal (Cronin and Taylor, 1992; Parasuraman et al., 1988). This necessarily means that perceived service quality is cognitive evaluation of service for every single service encounter whereas customer satisfaction is the accumulated effect on the customers' assessment of the services.

From the above discussion it is evident that the perception of service quality from the customers' perspective enables the healthcare service providers to identify different dimensions that lead to customer satisfaction. The effective measurement of service quality depends majorly on the customers' experience. In-depth knowledge and subsequent comprehension of customer experience regarding healthcare facilities may yield requisite inputs about their preferences of hospitals, measures for quality improvement, and evaluation of organizational performance. Moreover, health care quality perceptions of diverse groups of customers are inevitable for the smooth functioning of the healthcare organization. Subsequently, it determines organizational success due of its influence on customer satisfaction and organizational profitability (Williams & Calnan, 1991).

#### **1.4 Customer satisfaction and behavioural intentions**

Behavioural intention refers to the customers' perceived likelihood of carrying out certain behaviour (Fishben & Ajzen, 1975). Relating this to the firm perspective, the customer behaviour can be categorized into three aspects: (a) word-of-mouth, (b) repurchase intention, and (c) customer feedback. Word-of-mouth can be easily understood as a flow of information regarding products, services, or companies transmitted from one customer to another. Also, it aids the customers in the evaluation of product or services by providing a reliable external information source. Prior works relating to customer satisfaction and word-of-mouth have not reported uniform findings. Many researchers (Brown et al., 2005; Swan & Oliver, 1989; Holmes & Lwett, 1977) have ascertained that customer satisfaction directly and positively affects word-of-mouth. They have also emphasized on the

observation that satisfied customers generate more word-of-mouth. However, other researchers (Hart et al., 1990; Westbrook, 1987; Bearden & Teel, 1983) have highlighted a negative relationship between the respective constructs. Along the same lines, studies conducted by Engel et al. (1969) and Bettencourt (1997) have not determined any significant relationship between word-of-mouth and customer satisfaction. In addition, Wirtz & Chew (2002) explicated these contradictory findings with reference to an asymmetric U-shaped pattern, as per which more word-of-mouth is generated by both the groups of extremely satisfied customers and dissatisfied customers. Also, less word-of-mouth is generated by the moderately satisfied customers. Despite such mixed views regarding the type of relationship, there is a general consensus that bulk of positive word-of-mouth is generated by satisfied customers (Bitner, 1990). According to Richins (1983), negative word-of-mouth is mainly generated by the dissatisfied customers. Further, some research studies have concluded that satisfaction is vital but not enough for ensuring positive word-of-mouth, while, it is agreed that satisfaction leads to generating positive feedbacks. However, the elements of word-of-mouth are also dependent on other important factors such as culture, incentives, and customer emotions.

In light of the second aspect of behaviour mentioned above, the majority of researchers have supported the notion that satisfaction directly and positively affects repurchase intention (Bitner et al., 1990; Cronin & Taylor, 1992; Jones & Sub, 2000). However, the research study by Sivadas & Baker-Prewitt (2000) has not affirmed such a direct relationship. In order to explicate these contradictory findings, Rusk & Zahorik (1993) put forward the viewpoint that a satisfied customer might search and ultimately switch to an alternative supplier so as to enhance his/her current satisfaction level. Also, the lack of better alternatives might compel the dissatisfied customers to stick to the existing supplier. The third aspect of behaviour mentioned above- customer feedback- pertains to the type of information (positive and negative) transmitted from the customer to the service provider. The type of information can be in the form of compliments and complaints. Such kind of information can assist the service providers in identifying concern-areas that require immediate adjustments in terms of service performance. Limited research works (Soderlund, 1998, Alaska, 2014) have investigated the relationship between feedback and satisfaction. Also, the sample size of customers that have provided acceptable feedbacks has been small, limiting the generalizability of most studies in this respect. Nonetheless, Soderlund (1998) deduced that there is a higher

probability of getting negative feedbacks from dissatisfied customers in comparison to positive feedbacks from satisfied customers. In this regard, the general thought process of the customers who provide negative feedback might be seeking compensation for unmet quality of services, whereas, the customer as not being rewarded. In the same vein, empirical researches have supported the notion that there is a positive relationship between perceived service quality and behavioural intentions (Parasuraman et al., 1988; Zeithaml et al., 1996). Specifically, superior service quality can be evidently associated with positive word-of-mouth. Accordingly, Bitner (1990) determined that perceived service quality plays an influential role in determining behavioural intentions especially in connection with word-of-mouth and repurchase intention. In a similar manner, Dabholkar et al. (1996) delineated a positive association between service quality perceptions' and intentions to recommend product or service. Our research will try to add to the existing body of knowledge by validating a structural model that supports the transition of perceived service quality to customer satisfaction and then favourable behavioural intention as loyalty, positive feedback and revisit intention.

### **1.5 Choice of healthcare setting**

The healthcare sector in India has witnessed tremendous growth over the past two decades. In recent times, significant developments have been noticed offering it as a lucrative destination for availing medical services. The mechanics of Indian health care system is predominantly based on two levels: Public and private healthcare setting. The public domain accounts for 20% of Indian healthcare even though it is accessible to more than half of the total population (De Costa & Diwan, 2007). Despite its wide reach and inexpensive diagnostic services, multiple issues such as negligence of service providers, substandard equipment, shortage of medical supplies etc. have led to the gradual decline in the inclination of people towards public health care.

Encashing on this exact opportunity, Indian private health care sector has grown leaps and bounds and currently accounts for approximately 80% the total healthcare outlay (Loh, Ugarte-Gil, & Darko, 2013). The reason for the popularity of these establishments has been their ability to bring almost all types of health care services to the foray of customers. Most of these establishments use latest medical technologies in the provision of health services. The utilization surveys suggest that on an average three fourth of outpatients and one third of in-patients seek care from private healthcare providers (Maheswari & Bhat, 2004). In addition to this about 80 percent of the qualified doctors in



the country are employed in the private sector. Consequently, the sheer attractiveness coupled with advantages like easy accessibility, standardized procedures, world-class treatment stimulate the need for research in this field.

Referring to the above- mentioned stylized facts and lack of relevant research, it has become imperative to explore the private health care settings in the Indian context. Although private players offer superior facilities, advanced technology and better results but they charge higher prices for their offerings. This leads to a gap between customer expectation and the real perception with respect to performance. Repetition of service failure often leads to loss in customer base as well as business. This has called for investigating the issue of managing service quality which will result in favourable behavioural intention. We made an attempt to assess the preferred private health care settings out of three categories i.e. nursing clinics, corporate hospitals, and non-corporate hospitals. Through Analytical Hierarchy Process technique, we zeroed on non-corporate hospitals as the preferred choice of Indian customers and built up our research model on data and necessary inputs collected from the customers of the twelve private hospitals of three Indian states namely Odisha, Andhra Pradesh and Telangana.

## **1.6 Research objectives**

On the basis of the discussions presented in the previous sections, this section summarizes the issues and problems that the thesis attempts to address. The vital premise of this research is to propose a framework for providing guidelines for the decision makers, managers and healthcare sector in policy formulation with respect to perceived service quality. Succinctly, the research objectives of this thesis are as follows:

- To assess and examine the preferred healthcare setting in Indian private healthcare sector from customers' perspective.
- To investigate the diverse factors affecting customer perceived service quality and customer perceived value in Indian private healthcare sector.
- To examine the effect of perceived service quality and customer perceived value on customer satisfaction, loyalty and behavioral intention.
- To develop and validate a comprehensive empirical model to measure and manage the customer perceived service quality in Indian private healthcare sector.
- To prioritize customers perceived service quality and value dimensions that may suggest healthcare managers to initiate action for sustainable competitive advantage.

## **1.7 Research questions**

The following research questions are developed in alignment with the research objectives.

1. What are the preferred and better performing private healthcare settings in India as perceived by customers?
2. What are the diverse factors affecting the customer perceived service quality and customer perceived value in Indian private healthcare sector?
3. How is customer satisfaction related to perceived service quality and customer loyalty in Indian private healthcare?
4. What is the relationship between the perceived service quality of customers and behavioral intention in Indian private healthcare?
5. How is customer satisfaction related to customer perceived value and customer loyalty in Indian private healthcare?
6. How is customer satisfaction related to customer perceived value and behavioral intention in Indian private healthcare?

## **1.8 Contribution of this research**

The literature on service quality has acknowledged the importance of customer perceived service quality and their significant effects on loyalty and ultimately favourable behavioural intentions. Consequently, there is much to be gained from the understanding of how customers of private hospitals benefit from superior service quality offered. Despite decades of empirical research on service quality constructs vital for enhancing customer satisfaction, it lacks in developing a holistic model which can allow private healthcare service providers a degree of understanding as to how they will channelize essential efforts towards forming customer loyalty. There is major concern about the lack of a multilevel conceptualization of perceived service quality leading to positive intentions, whereas its importance has been acknowledged by various researchers. Through this study, it has been devised a holistic model, which can address the issues of identification of vital service quality dimensions as well as the interventions to manage perceived service quality resulting in sustainable business and prosperity for private hospitals and welfare for customers and beyond. Some of the major contributions of this thesis are summarized below:

- The importance of a customer-focused approach to private healthcare in India is established and need to determine the variables affecting customer satisfaction,

customer loyalty and behavioral intention is discussed which may be useful to healthcare managers.

- The importance of a holistic approach is established, ensuring that all stakeholders of the private healthcare are involved in the processes leading to the improvement of customer satisfaction.
- This research assesses and evaluates the different private healthcare setting in India on the basis of perceived service quality and perceived value dimensions through a robust prioritization technique that may help customers to choose the better service provider
- Additionally it tests and validate a proposed model of the relationships among perceived service quality, customer perceived value, customer satisfaction, customer loyalty and behavioral intentions in the Indian private healthcare industry. This may be useful for both researchers and practitioners of healthcare sector in corroborate the construct relationship.
- Finally, a framework is developed as a means to identify and improve ServQual dimensions instrumental in enhancing satisfaction using RIDIT analysis and Grey Relational Analysis. It also compares both the techniques to ascertain the ranking of dimensions which will be immensely useful for managers to incorporate and redesign their priority matrix.

## **1.9 Organization of the thesis**

In order to satisfy and meet the objectives of the study, the thesis is organized into eight chapters. Chapter one provides background and motivation for research as well as outlines the need to explore the Indian private healthcare sector. It also discusses the concept of perceived service quality, customer satisfaction, customer loyalty and behavioral intentions with respect to healthcare sector. This chapter also includes the research objectives and research questions. Chapter two comprises of the Indian healthcare scenario that has formed the basis of our research. It has narrowed down the theme from global health care outlook to current health status in the Asia pacific region to existing healthcare status in India. The chapter looks at the healthcare system of India from investment & expenditure perspective, existing and expected growth rate. It further introduces the private healthcare sector, its growth, contemporary market size of private hospitals and key corporate players in India. Chapter three details about the theoretical background and historical development concerning customer perceived service quality. It

begins with a discussion of the nature of service quality, perceived value, satisfaction, loyalty and behavioural intention. Next, service quality and perceived value is defined and research orientations for service quality, perceived value and factors affecting service quality discussed. The service quality measurement literature is summarized and application of external service quality dimensions to internal service quality measurement is examined. Chapter 4 discusses the data and methodology to be used for research to examine the research question. This chapter illustrates about the descriptive research design and the multivariate techniques which have been adopted for validation of the study. In this chapter we have briefly explained the data analysis techniques such as AHP analysis, EFA, CFA, SEM, RIDIT and Grey relational analysis. In addition to that data collection techniques, sampling size, research setting and ethical consideration of the research is also discussed. In chapter five AHP analyses was used for choosing preferred healthcare setting among the different types of private hospitals such as Nursing clinics, non-corporate hospitals and corporate hospitals with the support of three hundred seventy samples and nine service quality dimensions. The result of the analysis is also discussed with supported statistical values. Chapter six describes the perceived service quality enablers and interrelationship between them. The hypothesized research model is tested and relevant discussions are made. This chapter illustrates key findings to assist the managers and service providers of the healthcare industry and to develop strategies for improving satisfaction, loyalty and positive behavioral intention among the customers. Chapter seven assesses and prioritizes perceived service quality and value dimensions with the support of two robust techniques namely RIDIT analyses and Grey relational analyses. To ascertain the results priority ranks of both the test were compared and necessary implications are drawn. The final chapter eight discusses the findings in light of the research questions and hypotheses and the literature in general. This chapter concludes the study by showcasing the summary of findings, the implications of the study, future directions and limitations related to the study.

## Chapter 2

# Indian Healthcare Landscape

### 2.1 Introduction

Health and healthcare need to be distinguished from each other for no better reason than that the former is often incorrectly seen as a direct function of the latter (Srinivisan, 2010). Healthcare systems are complex in nature as the issues like customer care, quality, insurance, healthcare providers and legal issues often interact with each other. Healthcare is one of largest service sectors, which may be viewed as a glass half empty or half full. The healthcare sector's positive point is low-cost medical treatment. The rapidly growing middle-class, with its increasing purchasing power, has created a very well documented growth in the demand for goods and services in the emerging markets. This is especially true in healthcare, where the need for quality health care services has grown dramatically. Evolution and advancement of technology and communication systems is adding to the potential healthcare status and hence improving health literacy among people turning out to be more educated and modernized.

In spite of the growth and harmony in the health sector, there are trends that must not be ignored. Significant progress has happened in health and healthcare in the recent past has been unequal across geographies with numerous countries lagging behind the race. Secondly, the nature of health related issues are changing drastically and complexities increasing in an unexpected rate. Aging issue coupled with poorly managed urban life is accelerating the occurrence of communicable life globally. Third, the healthcare sector across the world is getting affected by the swift transition and transformation of globalization. Financial and economic crises are frequently challenging the healthcare access, delivery as well as financing. The gap between public and private healthcare sector is increasing thick and fast. Emergence of information and technology and public access to those has revolutionized the consumer demand and expectation. However the responses of the sector to the changing world have been inadequate particularly in third world countries. Another important issue is the lack of effective and efficient resources in many countries resulting inequitable access, impoverishing costs, and erosion of trust in health care constituting a threat to social stability. The call of the hour is to initiate structural changes and making health systems more equitable.

## **2.2 Global health care outlook**

The healthcare sector is facing uphill challenges globally which are capital intensive and health set up centric issues. This has result in expensive cost of healthcare, poor infrastructure; semi educated human resources, exposure to health risks and inadequate governance with improper documentation. In addition to this “only 20% of health outcomes depend on the strength of healthcare systems; the rest is a function of the health ecosystem and the broad determinants of Health” (World Economic Forum Report, 2016). The report also emphasizes that the orthodox healthcare system need to be replaced by modern and technology savvy healthcare space in order to keep the population healthy. It goes on to forecast that the global population will touch and surpass beyond 9.7 billion and in which about quarter of population will be well above 60. At present the world is not prepared to respond proactively to environmental forces that deter healthy and longer lives. In order to mitigate these challenges a uniform and proactive strategies are required to address the current challenges of the health ecosystem.

When the world economy prepares to recover from an unexpected slow down, “health spending of the population is expected to accelerate, rising an average of 5.2 percent a year in 2014-2018, to \$9.3 trillion” (2015 Global health care outlook, Deloitte). The sharp elevation of demand and expenses will be accelerated by an aging population, emergence of acute diseases, rapid globalization and improved information and communication technology. The demand for better health care is although intensifying still the cost of healthcare is significantly increasing. The growth in health spending cannot guarantee increased revenue and earnings because of cost of operation. In spite of cost containment few markets are estimated to undergo rapid spending growth as Govt. and private healthcare sector develop. The other key issues for overcoming challenges are adapting to market forces, transformation & digital innovation and Government regulation & compliance. The issue here is the priority which cannot be spelled out, the healthcare policy makers need to balance them to achieve common goals through innovative ways, scientific, quality care delivery, proper service quality that can improve the health of people globally. At the same time they need to invest strategically in response to available opportunities particularly in emerging markets where health infrastructure growth coupled with innovation and cost issues awaits as the next line of action.

## 2.3 Healthcare status in the Asia-Pacific

Like the rest of the world the Asia-pacific region is also facing several emerging health related problems resulting in decline of its health indicators in spite of economic growth of many countries of the region. The scarcity of capital and human resources is a major constraint for many other countries in the region. This is creating absolute hindrance to the achieving superior public health. The other vital issues are lack of technology, improper infrastructure and more importantly absence a formal strategic framework that can govern health service delivery in the region. The developing nations in the region are at varying stage of economic progress which leads to different level of healthcare systems. The issue here is on resource allocation & mobilization, equilibrium between public and private interventions relevant to health issues. In spite of the above mentioned challenges and economic slowdown, the rollout of public health care programs combined with increasing private wealth is expected to boost the region's health care spending by an annual average of 6.6 percent in 2015-2019. Among all the countries the most forecasted growth will be possible in India with a massive 16.1 percent per year. This will be possible because of the govt investment on public health expenditure has increased. The major portion of the investment will go to infrastructure improvements from its current equivalent of 1.2 percent of GDP to 2.5 percent of GDP within five years. China's healthcare budget growth in 2015-19 is estimated to be 8.8 percent a year. But this number may come down because of economic slowdown and uncertainty. The other notable country like Australia and South Korea are anticipating a rise of four percent growth a year. The developed economy like Japan continues to be one of the underperforming markets because of currency devaluation with to healthcare spending is not anticipated to recover until 2016, with an average growth in dollar terms of just one percent. The per capita healthcare spending of the Asia-Pacific is given in Table 2.1:

**Table 2.1: Global healthcare outlook**

Per-capita health care spending	
Australia	\$6,110
China	\$367
India	\$61
Japan	\$3,966
Southeast Asia (Singapore)	\$2,507

Source: Global health care outlook, Deloitte report, 2016

## 2.4 Healthcare status in India

India is one of the fastest-growing economies in the world and was ranked as sixth largest market globally in terms of size in 2014. The country is anticipated to be one of the top three healthcare markets in terms of growth by 2020. India's current spending on health care is expected to remain stable at the equivalent of 4.1 percent of GDP in 2015-2019 (Erumban & de Vries, 2014). At the same time as the growth is primarily driven by private sector players, govt. spending has continued to be low resulting in inadequate infrastructure, less manpower specifically in rural India. Some demographic and health related are furnished below.

**Table 2.2: Indian Healthcare Status**

<b>Indicator/Year</b>	<b>Statistics</b>
Total population (2015) (thousands)	1252140
Life expectancy at birth m/f (years, 2015)	67/70
Probability of dying under five (per 1 000 live births, 0)	NA
Probability of dying between 15 and 60 years m/f (per 1000 population, 2013)	239/158
Total expenditure on health per capita (Intl \$, 2014)	267
Total expenditure on health as % of GDP (2014)	4.7
Birth registration coverage (%) (2011)	84
Gross national income per capita (PPP INT \$)	5350
Total fertility rate (per woman) 2013	2.5
Number of live births (thousands) 2013	25595.2
Number of deaths (thousands) 2013	9944.9
WHO region	South-East Asia
World Bank income classification	Lower middle

Source: WHO report on healthcare sector, 2016

Some salient features of the sector are as follows:

- Among the entire sector, healthcare happens to be one of the fastest growing with a CAGR of 22.87% for the year 2015-2020 and is set to reach 280 billion US dollar.



This throws an immense opportunity and scope for making the healthcare services better and entering into virgin geographies which presents significant opportunity.

- The driving force that can boost the demand for healthcare services in India are as follows: a huge population and an ageing one, rising disposable income, changing lifestyles of Indians and enhanced focus on preventive healthcare.
- India is growing its reputation as a cherished destination for medical tourism thanks to the low cost medical services attracting customers around the globe. Again the 'Make in India' initiative of the present govt. has made India a R&D hub which can further reduce the cost of clinical research.
- The healthcare industry in India is also attracting angel investors, venture capitalist and private equity because of favourable investment climate, better tax regime and supporting govt. policies and practices.

The healthcare sector in India is dominated by private healthcare which constitutes more than 70% of the total market share. Hospital industry is the prime contributor with a total size of around USD 54.7 billion by 2017. This may contribute approximately 82% of the revenue generated as a whole by the healthcare industry (Oberth, 2013). Still there are considerable loopholes in terms of number of beds, doctors and paramedical staff. The patient to doctor ratio is far below than the WHO prescribed 1:250. The govt of India has initiated number of measures and programs to bring back the sector into the growth track by enhancing the budgetary allocation to 2.5% of the GDP but those are found to be too little and too late. Foreseeing 2016 and beyond, the health sector in India will have to flick the orthodox ideas into innovative business models by significantly improving access, service quality and technology. Many players have already incorporated creative models in order to expand their reach in smaller cities and towns by reducing cost of healthcare. Eventually the intelligent use of technology like telemedicine is serving care providers optimize limited resources at a low cost.

## **2.5 Indian healthcare system: investment & expenditure**

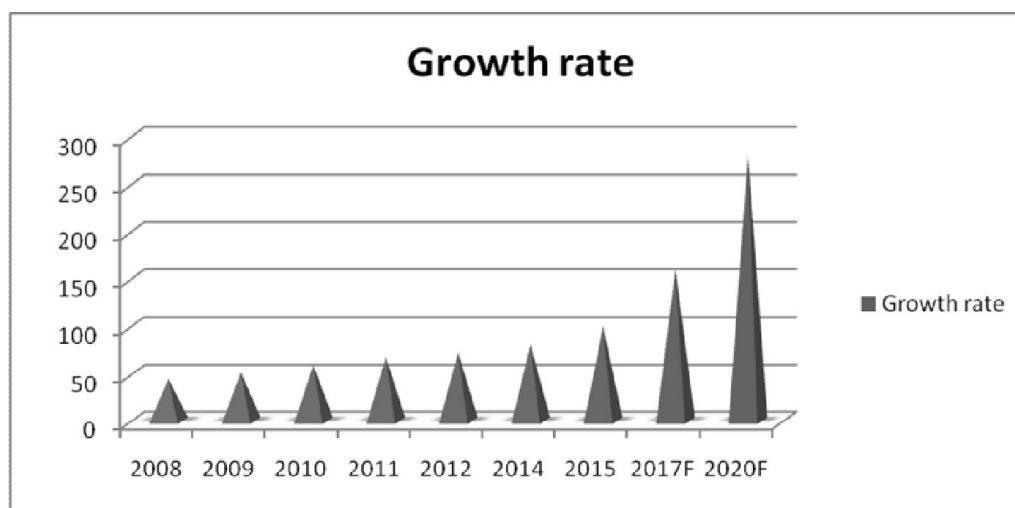
In India the healthcare industry is one of the largest industries both in terms of revenue and employment. The total size of the Indian healthcare industry is estimated to be US\$ 100 billion and this figure will go up to US\$ 280 billion by 2020 with cumulative average growth rate of 22.9 per cent (PWC report, 2015). The healthcare delivery system in India encompasses hospitals both public and private, smaller nursing homes, diagnostic centres

and pharmaceuticals those constitute 65% of the total market. As per the report, the technology driven healthcare is also picking steam and likely to grow at a CAGR of 23% to touch US\$ 160 billion by 2017 and US\$ 280 billion by 2020.

**Table 2.3: Healthcare sector growth trend (USD billion)**

Year	Value	Year	Value
2008	45	2014	81.3
2009	51.7	2015	100
2010	59.5	2017F*	160
2011	68.4	2020F*	280
2012	72.8	CAGR: 16.5%	

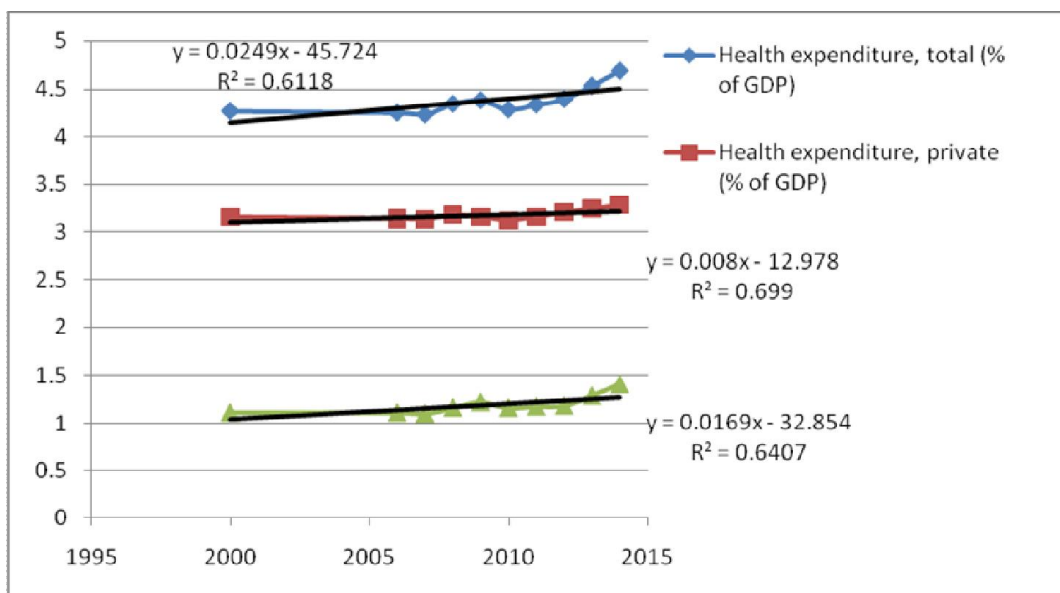
Source: Frost & Sullivan (2016), LSI Financial Services, Deloitte Report, \*F-Forecast



**Figure 2.1: Indian healthcare sector growth rate**

Healthcare expenditure in India as a percentage of Gross Domestic product has steadily positioned within the range of 4-5% since the year 2015 (Figure 2.2). The contribution of both public and private expenditure on healthcare has also been steadied during the period where the Govt spending on healthcare has marginally increased recently (Figure 2.2). Among all countries in the world India ranks 171<sup>st</sup> out of 175 as percent of GDP spending on healthcare. As per as healthcare spending per capita is concerned India ranks even lower with \$132. However this scene is likely to become better with increasing level of health spending which is expected to grow at 15-16% annually (Figure 2.1). The increase in healthcare expenditure from \$38 billion in 2007–08, the rise has gone up to \$54–62 billion in 2009 and then to \$76 billion in 2012–13 and projected to be \$154 billion in 2017–18 and, \$280 billion in 2020. It is expected that out of

the entire spending majority will come from the private sector healthcare. It has been witnessed that in last one and half decade the private healthcare has grown much faster than Government spending with a CAGR of 15% as compared to CAGR of 13%.



**Figure 2.2: Total health expenditure vis-a-vis Public & Private sector's as % GDP**

Source: <http://databank.worldbank.org/data/ddperror.aspx?aspxerrorpath=/data/reports.aspx> (2016)

It has been observed that India's household healthcare spending is continuously rising since the LPG post 1991. In a period of ten year between 1995 to 2005, the household spending has gone past 7% from 4% and in subsequent period to 9% in 2015 and a conservative estimation of 13% by 2025. This kind of growth will take the healthcare sector to the third position in Indian economy sector. A detail statistics on the sector is given in Table 2.4.

The government of India is presently focusing on couple of health sectors i.e. infrastructure development in both rural and urban area under National Rural Health Mission and National Urban Health Mission. The other area is providing insurance for mass that will encompass and cover costly hospital expenses through Rashtriya Swasthya Bima Yojna. The government of India has been the payer, provider and at the same time the regulator of healthcare business. In terms of payer, the government has initiated the health insurance policies, social security schemes and owned as well as managed government hospitals, primary health centres in both allopathic and traditional medicines. The govt. has also invested in medical colleges and subsidized medical education. At present the government has also invested in more than 42 programs which directly aims at

prevention and management of communicable and non communicable diseases. Health awareness and better healthcare practices promotion is also another dedicated area of the government through the ministry of health and family welfare. The newly formed NITI Aayog has prescribed USD55 billion for the ongoing five year plan to the Health and Family Welfare ministry which happens to be almost three times of that of the previous five year plan. Again in the 11<sup>th</sup> five year plan the healthcare allocation was 0.9% of GDP but in 12<sup>th</sup> five year plan it has been enhanced to 2.5%. This budget will primarily be dedicated towards building world class infrastructure, R&D facilities, mass healthcare support and laying down strong regulations for the sector. The universal health coverage to Indian population will ensure that they would be completely certain about their treatment and recovery at an affordable price.

**Table 2.4: Indian Healthcare expenditure scenario**

Series Name	2000	2006	2007	2008	2009	2010	2011	2012	2013	2015
Health expenditure, total (% of GDP)	4.26	4.24	4.22	4.33	4.37	4.28	4.33	4.38	4.52	4.68
Health expenditure, private (% of GDP)	3.15	3.13	3.12	3.17	3.15	3.11	3.15	3.20	3.24	3.27
Health expenditure, public (% of GDP)	1.11	1.11	1.10	1.16	1.22	1.16	1.17	1.18	1.28	1.40
Out-of-pocket health expenditure (% of total expenditure on health)	67.9	65.7	65.3	64.4	63.3	63.4	64.4	64.9	63.8	62.4
Out-of-pocket health expenditure (% of private expenditure on health)	91.8	89.0	88.2	88	87.8	87	88.4	88.9	89.1	89.2
Health expenditure per capita (current US\$)	19.6	34.6	43.2	46.9	48.2	59.2	65.7	64.9	68.5	75
Health expenditure, public (% of government expenditure)	4.38	4.39	4.42	4.34	4.36	4.29	4.42	4.48	4.65	5.04
Health expenditure, public (% of total health expenditure)	26.1	26.2	26.0	26.8	27.9	27.1	27.1	27	28.4	30.0

Source: Data from database: World Development Indicators; Accessed on: 19/07/2016

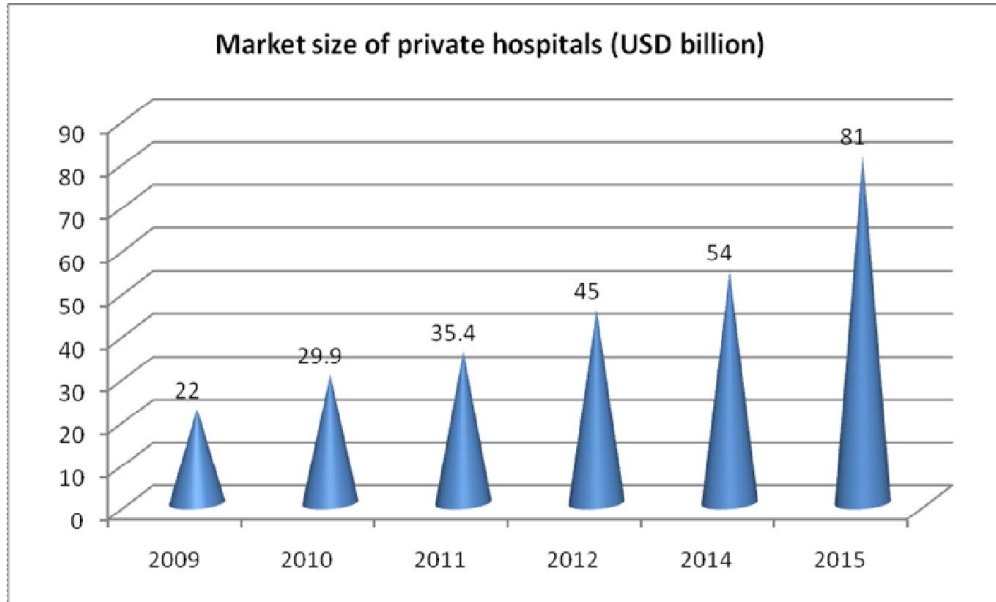
In India the scope for improving healthcare services is immense and significant as the spending as percentage of GDP is rising all the time. The biggest opportunity and ground for expansion is the rural Indian market which accounts for more than 70% of the country's total population. India needs approximately 7, 00,000/- beds in coming five years or so which calls for an investment of roughly US\$ 30 billion. If this will be the volume of investment expected in near future, then the volume of transaction is likely to witness a significant leap.

India as a medical tourism destination is inviting over US\$ 3 billion annually and the approximate tourist footfall is 230,000. At the same time the medical tourism sector is set to touch US\$ 6 billion by the end of 2018. This necessarily means that the number of foreign patients coming to India for treatment will exceed and be doubled in coming three years. The medical accreditation society is accrediting more number of hospitals in both large and medium healthcare set up the medical tourism sector is set to be in the global tourism map sooner than later. That's why private healthcare sector in India held promise in order to attract huge investment both from global and Indian investors as the investment in Indian healthcare has enhanced to US\$ 30 million from US\$ 15 million, as per PriceWaterHouseCoopers report, 2015.

## **2.6 Growth of the private sector and corporate hospitals: Key Players**

After India got independence in 1947, the health and healthcare sector was dominated primarily by govt funded institutions. But today the private sector has emerged as a vibrant force in India's healthcare industry, lending it both national and international repute. After the entry of private players in the healthcare sector has gained momentum and gathered national and global recognition. In the year 2005, the private healthcare providers' share to the total share was 66%, but in 2015 it has risen to 81%. In terms of number of bed the share of private hospitals were 40% and all set to rise in near future. Private healthcare players are investing in large volume which will drive the development of infrastructure, facilities and services in the healthcare scene. The expenditure that is taking place in this sector is also ruled by the private sector accounting for more than 74%. The momentum of the growth of these players is contributed by cheap labour, educated staff and more importantly they can understand and speak English proficiently in private hospitals and diagnostic centres. As the govt sector is concentrating more on primary healthcare, the private sectors' presence is more felt in secondary and tertiary care but primarily located in top cities of India. The services and facilities in these hospitals is the

prime reason for customers to even spend beyond their reach to avail quick response therapy. All this will help the sector to cross over USD280 billion by 2020 which is at present valued at USD81.0 billion with the size of the private hospitals market from 2009 to 2015 was having a CAGR of 24.2%



**Figure: 2.3: Indian private healthcare sector market size**

The emergence of corporate hospital has happened when Apollo hospital was set up in Chennai in 1983. Apollo was the first to be registered as a publicly listed company and the first to receive funding from public financial institutions. This followed the acknowledgement in 1982 by the MoHFW’s National Health Policy that private providers played a role in helping the country reach its goal of “health for all.” The central government conferred on the hospital sector “infrastructure status” (in 2002–03 Union Budget) and “industry status” (in 2003–04 Union Budget), which facilitated loans from public financing bodies like the Industrial Development Bank of India at favorable interest rates. An additional spur came from liberal reforms enforced by the World Bank, International Monetary Fund, and other international financing bodies in the 1990s to facilitate economic restructuring and ensure debt repayment. This had the consequence of reducing public expenditures on social services such as healthcare in developing countries as well as encouraging the private sector to promote greater competition in healthcare financing and delivery. Some of the top performing corporate healthcare providers are as follows:

**Table 2.5: Key corporate players in Indian healthcare setting**

Company/Group	No of beds	Presence (City wise)
Apollo Hospitals Enterprise Ltd	9,215	Chennai, Madurai, Hyderabad, Karur, Karim Nagar, Mysore, Visakhapatnam, Bilaspur, Aragonda, Kakinada, Bengaluru, Delhi, Noida, Kolkata, Ahmedabad, Goa, Mauritius, Pune, Raichur, Ranipet, Ranchi, Ludhiana, Indore, Bhubaneswar, Dhaka, Bachel, Bellary, Lavasa, Nashik, Nellore, Trivunnamalai, Trichi.
Aravind Eye Hospitals	3,649	Theni, Tirunelveli, Coimbatore, Puducherry, Madurai, Amethi, Kolkata, Dindigul, Tirupur, Salem, Tuticorin, Udumalpet
CARE Hospitals	2,100	Hyderabad, Vijayawada, Nagpur, Raipur, Bhubaneswar, Surat, Pune, Visakhapatnam, Jabalpur, Raigarh
Fortis Healthcare Ltd	10,000	Mumbai, Bengaluru, Kolkata, Mohali, Noida, Delhi, Amritsar, Raipur, Jaipur, Chennai, Kota, Faridabad, also the company present in Singapore, Dubai, Mauritius and Srilanka
Max Hospitals	2016	Delhi, NCR, Punjab, Uttarakhand
Manipal Group of Hospitals	4,900	Udupi, Bengaluru, Manipal, Attavar, Mangalore, Goa, Tumkur, Vijayawada, Kasaragod, Visakhapatnam
Narayana Health	7452	Ahmedabad, Bengaluru, Berhampore, Davangere, Dharwad, Durgapur, Guwahati, Hyderabad, Jaipur, Kolar, Jamshedpur, Kolkata, Kuppam, Mahuva, Mysore, Raipur, Shimoga, Bellary, Palanpur

Source: Company websites, Fortis Red Herring Prospectus, TechSci Research, 2016

## 2.7 Conclusion

It is evident from the above discussion that there has been significant improvement taken place in modernizing healthcare sector in India but still much has to be done and left untouched. Majority of the changes has taken place after the Indian economy got open in 1991 which set free many aspirations to bring on the much needed energy that can solve gigantic problems in public health and, especially, healthcare delivery. But the gap

between healthcare supply and demand issues remains a million dollar question to be answered. The healthcare infrastructure in India is seriously been ignored by multiple governments thanks to low public financing by the ruling govt and even lower utilization by the state govt. The govt hospitals have always under the constraints of poor facilities and human resources to take good care of both the internal and external customers. What add to these miseries are the healthcare spending inequalities between urban and rural areas, as well as between allopathic/curative and public health/preventive services. Availability of beds for patients in urban area is far more than that of the rural area more importantly this gap is even wider comparing govt and private hospitals. At the same time there is severe scarcity of doctors and specialist in rural areas in public sector units as many doctors are unwilling to stay and serve in villages lacking resources for family. With regard to the quality of drugs, India is deprived to have a sub standard system of drug management and delivery. This sincerely showcases the poor or in other words absence of a formal regulation that controls and regulates manufacturing and testing drugs.

In India the health insurance sector is growing steadily in last decade with approximately 15% of Indian population has some form of health insurance. The compounding issue of public healthcare and an opportunity that is provided by health insurance has opened the door for private players to milk the market. Although the cost of care is significantly higher in private sectors, customers still prefer them over govt hospitals because of service quality. The quality of services in private healthcare also varies with respect to size, sector and locations. As customers expectations grow towards the private health care service providers it is more important to fulfill them so that the customers can be retained. The private sector is also getting intensely competitive and calls for stringent measures from players relating to continuously upgrading service quality. Eventually higher consumer spending on healthcare alone will not solve the acute problems that engulf the healthcare sector. The healthcare issues are by products of some social and political factors. This calls for drastic steps where more investment is needed across variety of quality care dimensions that may improve the structure of healthcare, its processes and delivery.

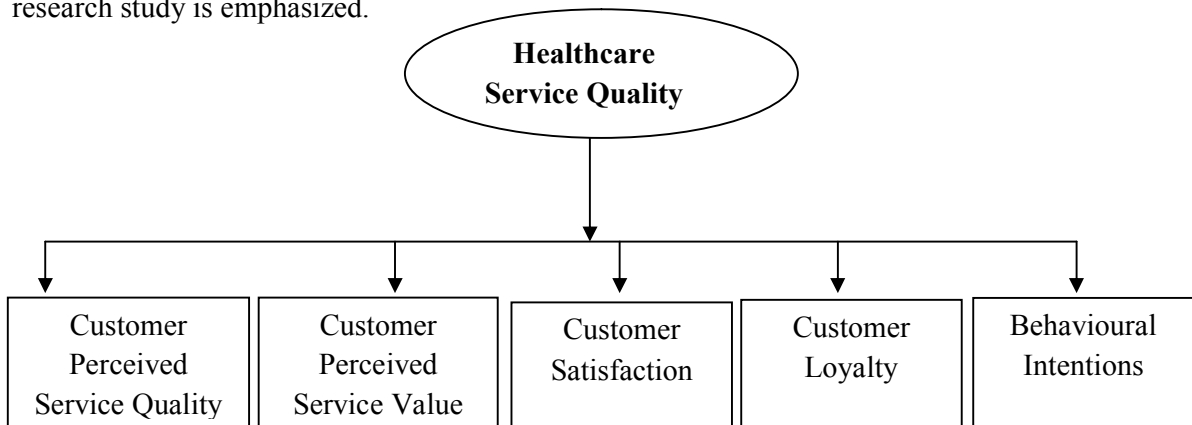


## Chapter 3

# Review of Literature

### 3.1 Introduction

This chapter looks at existing theory and findings of previous research work done on the customer perceived service quality in both Indian and global contexts. The literature review furnishes adequate confidence to recognize a pertinent gap and procedural weaknesses in the existing literature to crack the research problem. The literature is classified into five categories: each dealing with specific issues associated with managing customer perceived service quality as demonstrated in Figure 3.1. The next sections provide a brief discussion on research issues and critical investigation of literature. Finally, this chapter is concluded by summarizing the customer perceived service quality aspect in India and probable literature gaps and then the relevance of the research study is emphasized.



**Figure 3.1: Systematic review of literature through constructs**

### 3.2 Service Quality

A service has been defined as ‘any activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything...’ (Kotler et al., 2013). A widely accepted definition of quality in healthcare, as given by the Institute of Medicine (IOM), is “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (Lohr 1990). Service quality is defined as consumers’ (patients) judgement about the overall excellence or superiority of a mobile health service (Zeithml, 1987). Service quality has been defined as measuring performance against expectations

(Gronroos, 1982) or the gap between expected and perceived service (parasuraman et al. 1988) or performance only measures (Brady & Cronin 2001; Babakus, 1992; Dabholkar et al. 1996; Cronin & Taylor 1992). Quality in any service oriented organization is a measure of the degree to which the service delivered should meet the customer's expectations. The important characteristic of most services is that the customer almost always is available/present in the service delivery process. This indicates that the perception of service quality is influenced not only by the "service outcome" but also by the "service process". The perceived service quality can be represented as follows:

Perceived Service Quality (PSQ) = Prior Service Customer Expectations (PSCE) + Actual Service Process Quality (ASPQ) + Actual Service Outcome Quality (AOQ).

Service quality has become an important topic in relationship to profit, cost saving and market share (Devlin and Dong, 1994). Health and economic development are so closely related that it is impossible to achieve one without the other. While the economic development in India has gained momentum over the past few decades, its health system is at a cross-road (Ramani & Dileep, 2006). Research links service quality to customer satisfaction (Taylor & Baker, 1994) and purchaser intentions (Zeithaml et al., 1996). Researchers suggest that customer service quality perception is a key determinant in the healthcare organisation's success owing to its primary role in achieving customer satisfaction and hospital profitability (Donabedian, 1966).

According to Bitner & Hubbert (1994) service quality is "the consumer's overall impression of the relative inferiority/superiority of the organization and its services". Service quality assessments are not a single dimensional (Choi et al., 2004) and are defined as how well the service meets/exceeds customer expectations on a consistent basis (Parasuraman et al., 1985). Another research study by O'Connor et al. (1994) customers' perspectives defined as "a meaningful indicator of health services quality" and could represent the most vital perspective. Service consistency varies between one to another regions and sector to sector. Unlike product quality, service quality is hard to define and measure as interrelationships between user expectation and the impact on specific features in service such as intangibility, inseparability, heterogeneity and perishability (Parasuraman et al., 1985; Zeithaml et al., 2006). The Service Quality Gaps Model and SERVQUAL scales proposed by Parasuraman et al. (1985, 1988) are widely accepted tools for measuring service quality (Sohail, 2003; Ladhari, 2008). Dabholkar (1995) suggested that service quality and satisfaction antecedents are situation specific and if a

consumer is cognitive oriented then s/he will perceive the relationship as service quality causing satisfaction, whereas if a consumer is affective oriented then s/he will perceive the relationship as satisfaction causing service quality. There is ample evidence that service quality affects perceived value, customer satisfaction and behaviour intentions including word-of-mouth, loyalty, personal recommendation and willingness to pay more (Baker & Crompton, 2000).

### **3.3 Healthcare service quality**

In this section we aim to cover quality from healthcare service quality point of view and various dimensions those influence its degree of intensity. We start with elaborating why service quality in healthcare needs to be defined and managed. Then different approaches toward dimensions of service quality in healthcare that present in the literature will be discussed a thorough list of the constructs of healthcare service quality will be narrated on the basis of previous research study.

Quality issues taking into focus to healthcare services, there is no regular perceptiveness concerning who should play the lead role in identifying service quality. It could argue that central focus should be through on customers, because they are the main disk of the consumption pattern. Consumers' presence is an essential part for healthcare organization. In today's highly competitive healthcare, public and private organisation managers need to measure their financial and non-financial performance to improve function and increase their competitiveness. Service quality therefore interests service marketing researchers. Superior service quality helps differentiate itself from its competition, gain a sustainable competitive advantage and enhance efficiency. Many empirical studies have investigated the relationships among service quality, customer satisfaction and loyalty in many service sectors. Grönroos (1984) defined service quality as a perceived judgement resulting from an evaluation process where customers compare their service expectations with what they perceive to have received. The general outcome of healthcare is viewed as service quality. Another research concept on a quality focused in healthcare was initiated by Sower et al. (2001) and they articulated that quality characteristics should be recognized mutually by customers and service providers, as both have "valuable insights" on characteristics may create superior quality in hospitals. So, making assessment with customers-oriented focus in service quality, it is visible that healthcare service quality focus is distinctive to some extent as some researchers incorporate not only customers' perception of quality but service providers' perception as

well. In healthcare, there are limited tools available for assessing service quality in different categories such as an acute care hospital, independent dental offices, AIDS service agencies, with physicians and nurses and hospitals (Taner & Antony, 2006). Premium service quality in healthcare enables hospital managers to differentiate the hospital and gain a sustainable competitive advantage and enhance efficiency (Olorunniwo et al., 2006). According to Aagja & Garg (2010) hospital service quality is the discrepancy between customer perceptions and their expectations about hospitals offering such services. Some studies on patient perception conducted in developing countries show that customers are able to assess and evaluate service structure, process and outcome (Haddad et al., 1998; Andaleeb, 2001; Baltussen et al., 2002).

### **3.3.1 Customer perceived service quality in healthcare**

In the extremely competitive healthcare atmosphere, healthcare organisations cannot be champions based on yesterdays/previous standards of quality. Every-day the standards of quality in healthcare sector is rapidly changing. Perceived service quality in healthcare initiates by customer expectations. As consequence, it is necessary to recognize customers' expectations of service quality and its may incorporate into a service delivery process. Health care generally comprises systems that undertake actions that aim to sustain and enhance the health and well being of societies (Campbell et al., 2000). The health care sector is one of the most essential yet complex systems in society (Brahmbhatt et al., 2011) given that actual lives of people are being dealt with. With this, the concept of quality in the health care services becomes greatly imperative. Healthcare service quality, as most health institutions and professionals would define it, means rendering services that amplify the chances of achieving better health outcomes (Kapoor, 2011; Buyukozkan, 2011) and accordingly promote the welfare of the people. Customer perceived service quality refers to the customers' decision about a health-care service provider's overall excellence (Parasuraman et al., 1988). This decision is the result of the gap between what a customer feels that a health care service provider should offer and his perception of the actual performance of the health care service (Parasuraman, et al., 1988). It is also a fundamental task to continue follows today's quick changes and generate innovative standards of healthcare services to meet future demands. Researchers found that perceived service quality plays a important role in creating a satisfied and loyal customer support (Ostrowski, O'Brien, & Gordon, 1993). Different approaches have been used to assess perceived service quality in health care context (Table 3.1). Enhanced

service quality make higher in client retention rates, in addition to take advantage of market value. Various research studies have adapted the SERVQUAL scale; whereas different researchers have developed some new instruments (Arasli, Ekiz, & Katircioglu, 2008; Ramsaran-Fowdar, 2008; Kondasani & panda, 2015). The constructs of healthcare service quality were differed in number of dimensions and nature of dimensions among various research studies such as Reliability and Responsiveness (Anderson, 1995; Kilbourne et al., 2004; Baker et al., 2008;), Physical Environment (Karassavidou et al., 2009; Arasli et al, 2008; Rose et al., 2004), Empathy (Arasli et al., 2008; Headly & Millet, 1993; Gabott & Hogg, 1994;), Efficiency (Sower et al., 2001), Timeliness (Donabedian, 1980; Barden et al., 2002; Evans & Lindsay, 2009;Scobie et al, 2006), Transparency (David, 2003), affordability (Lim & Tang, 2000;), communication (Andaleeb, 2001, Gross & Nirel, 1998; ), and consistency (Evans et al., 1999).

Researchers and industry experts accept that delivery of premium quality services in any service based firms is a relevant strategy for continued existence and success of the organisation (Brown & Swartz, 1989; Parasuraman et al., 1988; Thompson et al., 1985). According to Bolton and Drew (1994) the mainstream of the investigation in services sector depends on customer satisfaction and perceived service quality for classification of customer appraisals of services. Another key researcher (Cronin & Taylor 1992) disagrees with that perceived service quality and customer satisfaction are exceptional dimensions that carve up a close relationship. Babakus & Boller (1992) also establish that perceived service quality can be engaged for measure the height of customer satisfaction. Instead of more advantages in SERVQUAL approach some researchers have been disparaged the SERVQUAL model. Two disparages are notable in that one by Peter et al. (1993) links to the indirect differentiation score approach. According to them “the difference score approach causes poor reliability and problems of variance restriction associated with the component scores”. Brown et al. (1993) observed that difference scores formed theoretically lesser reliabilities than their component scores. Controlled variance is an additional usual outcome of difference among two direct instruments, undermining the predictive validity of the model.

**Table 3.1: Diversity of Healthcare Service Quality Measurements**

Author & Year	Industry/ Domain	Country	N	Original items and analysis method	Dimensions (number of items)
Babakus & Mangold (1992)	Hospital service quality	USA	443	15 items: (expectations and perception scores)	One-dimensional structure for expectations and perception scores
Nelson et al (1992)	General/ surgical hospital	USA		41 Items	Medical/billing, nursing/daily care, admissions and discharge
Headley & Miller (1993)	Clinic service quality	USA	159	22 items (expectations perception scores)	Dependability (6), empathy (4), reliability (4), responsiveness (4), tangibles (2), presentation (2)
Vandamme & Leunis (1993)	Hospital service quality	Belgium	70	28 items expectns/ perception scores	Tangibles (4), medical responsiveness(3), assurance I (3), assurance II (3), nursing staff (2), personal beliefs/values (2)
Taylor & Cronin (1994)	Health services	USA	343	22 items	Reliability (5), assurance (4), tangibility (4), empathy (5), responsiveness (4).
McAlexander et al., (1994)	Dentist Practicing	USA	346	15 items perception expectation score	Tangibles (3), reliability (3), responsiveness (3), assurance (3) and empathy (3).
Anderson (1995)	University health Clinic	USA	431	15 items perception & expectation score	Tangibles(3) reliability(3) responsiveness (3) assurance(3) and empathy(3)
Tomes & Ng (1995)	NHS Hospital	UK	128	49 Items perception and expectation score	Empathy (10), Relationship of mutual respect (9), Dignity (9), Understanding of illness (5) Religious needs (1) food (6) Physical Environment (9)
Butler et al., (1996)	Private Hospital	USA	473	Perception scores	Perceived human performance (4), perceived facilities quality (5)

Lam (1997)	Hospital service quality	Hong Kong	84	22 items (expectations and perception scores)	One-dimensional structure for expectations and perception score
Angelopoulos et al., (1998)	Private and public hospital	Greece	40	32 items (expectations and perception scores)	Professional competence and interpersonal skills, cost of medical care, surroundings (temperature, noise, decoration), quality of food and administrative services offered
Camileri & O'Callaghan (1998)	Public and Private hospitals	Malta		16 Items (perception and expectation score)	Catering (2), Hospital Environment (3) professional and technical quality (3) patient amenities (3) service personalization (3)
Shemwell & Yavas (1999)	Hospital service quality	USA	218	14 items perception only score	Search attributes (5), credence attributes (4), and experience attributes (5)
Fuentes (1999)	Public Hospitals	Spain	170	20 items perception expectation score	Tangibles (12), reliability (6), process of performance (2)
Lim & Tang(2000)	General practitioner	Singapore	252	25 items (expectations and perception scores)	Tangibles (5), Empathy (4), Responsiveness (4), Reliability (5), Assurance (4), accessibility and affordability (3).
Andaleeb (2001)	Hospital and clinic service quality	Bangladesh	207	33 items (perception only scores)	Responsiveness(6), discipline(6), assurance(6), communication(5), baksheesh(2)
Sower et al., (2001)	Not for profit hospital	USA	663	75 items (perception only score)	Respect and caring (26), effectiveness and continuity (15), appropriateness (15), information (7), efficiency (5) effectiveness meals (5), first impression (1), and diversity
Baltussen et al., (2002)	Urban and rural healthcare centres	Burkina Faso	1081	22 items (perception only score)	Employee practices and conduct (6), sufficient resources (5), healthcare delivery (4), care (5)

Sohail (2003)	Private hospital service quality	Malaysia	150	15 items	Tangibility (4), reliability (2), assurance (4), responsiveness (2), and empathy (3).
Baldwin & shoal (2003)	Dental care services	Australia	354	22 items	Responsiveness (6), empathy and assurance (8), reliability (4), tangibles (4)
Kilbourne et al (2004)	Nursing home	USA and UK	294	13 items	Tangibles (3), reliability (3), responsiveness (3), empathy (4).
Rose et al., (2004)	Private and public hospitals	Malaysia	523	72 items (perception-only scores)	Social support (11), patient education (10), technical (8), interpersonal (11), overall quality (5) cost (6), amenities/environment (7), access/waiting time (8), outcome (6),
Wisniewski & Wisniewski (2005)	General hospital	Belgium	70	17 items	Tangibles (4), medical responsiveness (3), assurance-I (3), Assurance-II (3), nursing staff (2), personal beliefs and values
Kara et al., (2005)	Non-profit healthcare firms	Turkey	139	34 items (expectations and perception scores)	Tangibility (9), reliability (5), responsiveness (8), assurance (5), courtesy (5) empathy (2).
Rao et al., (2006)	PHC's & CHC's	India	2480	16 items (perception scores only)	Medicine availability (2) medical information (3) staff behaviour (2) doctor behaviour (5) clinic infrastructure (4)
Taner & Antony (2006)	Public and private hospital	Turkey	200	40 items (expectations and perception scores)	Tangibility (8) reliability (4), responsiveness (7), competence (5), credibility (1), security (1), access (2), communication (6), cost (1), understanding (2).
Wan-I Lee et al., (2007)	Public and private hospital	Taiwan	193	26 items	Admissions and convenience (4), Bill (2), Comfort and Cleanliness (8), Nursing Care (6), Physician Care (6).



Arasli, et al., (2008)	Public and private hospitals	Northern Cyprus	454	48 items (expectations and perception scores)	Relationships between staff and patients (9), empathy (10), professionalism of staff (5), giving priority to inpatients' needs (9), food (6), and physical environment (9)
Bakar et al., (2008)	University hospital	Turkey	472	15 items (expectations and perception scores)	Tangibility(3), assurance (4) reliability(3), responsiveness (3) and Empathy (2)
Fowdar (2008)	Private hospital	Mauritius	257	45 items (expectations and perception scores)	Measure of service adequacy(MSA):responsiveness/tangibility (15), image/fair and equitable treatment(4), assurance/empathy (19), core medical services/ professionalism/skill/competence (5), and reliability (2)
Karassavidou et al., (2009)	Public hospitals	Greece	137	25 items (expectations and perception scores)	Human aspect (16), physical environment and structure (7), and access (2)
Raposo et al., (2009)	PHC's	Portugal	414	27 items (perception scores only)	Staff (4), facilities (10), medical care (7), nursing care (6),
Narang, (2010)	Govt and Non for profit hospitals	India	500	20 items (perception scores) Exploratory factor analysis	Health personnel practices and conduct (6), Adequacy of resources and services (5), Health care delivery (5) and Access to services (4)
Agaja & Garg (2010)	Public hospitals	India	400	expectations and perception scores	Admission (4), medical services (4), overall service (9), discharge (4), social responsibility (3)
Aqel & Al-Tarawneh, (2013)	Private hospitals	Jordan	300	35 items (perception scores only)	Essential health services (8), Non-health services (9), Nursing and medical staff (8)

Peprah, (2014)	Public hospital	Ghana	214	25 items (perception scores only)	Empathy (9), reliability (6), Tangibility (5), Communication/interpersonal relationship (4), responsiveness (1),
Kondasani & Panda, (2015)	Private hospitals	India	475	44 items (perception scores only)	Physical environment (11), reliability (7), customer friendly staff (5), communication (7), responsiveness (4), privacy and safety (4), customer satisfaction (3), loyalty (3).
Padma et al., (2015)	Public and private hospital	India	408	50 items (perception scores only)	Infrastructure (10), personnel quality (12), process of clinical care (6), administrative procedures (8), safety signs (8), hospital image (3).
DonHee Lee (2016)	Patients & public respondent	South Korea	636	26 items (perception scores only)	Empathy (7), tangibles (5), safety (4) efficiency (4) & degree of improvement of care services (6)

In the literature, it is generally accepted that perceived service quality has a positive impact on customer satisfaction (Cronin & Taylor, 1992; Cronin, Brady, & Hult, 2000; Brady et al., 2005; Bei & Chiao, 2006; Kim, 2011; Rha, 2011; Shukla, 2010). Cronin et al. (2000) found such a positive relationship in service settings, including health care services. In terms of specific health-service research, Kondasani & Panda (2015) developed and empirically tested a six dimensional model of patient satisfaction with customer loyalty in Indian hospital services: Physical Environment, Reliability, Customer Friendly Staff, Communication, Responsiveness and Privacy & Safety. The result of the author's empirical study indicated that the six dimensions explained 59% of the variation of patient satisfaction and customer loyalty, and that the dimension of "physical environment" had the greatest impact on satisfaction. Dagger et al. (2007) found that overall healthcare service quality had a positive impact on customer satisfaction and behavioural intentions. Dagger & Sweeney (2006) reported that customers perceptions of technical service quality had a significant influence on their level of satisfaction with clinic services; however, functional service quality had a lesser influence on customer satisfaction.

**Table 3.2: Measurement items of customer perceived service quality**

Authors & year	Frequently used measurement items for PSQ: Reliability and responsiveness (1); Physical Environment (2); Empathy (3); Efficiency (4); Timeliness (5); Transparency (6); Affordability (7); Communication (8) and Consistency (9).								
	1	2	3	4	5	6	7	8	9
Arasli et al., 2008	×	*	*	×	×	×	×	×	×
Baker et al., 2008	*	×	*	×	×	×	×	×	×
Brady et al.,	×	*	×	×	*	×	×	×	×
Carmen, 1990	*	×	*	*	×	×	×	×	×
Akter et al., 2008	*	×	×	×	×	×	×	*	×
Anderson, 1995	*	×	*	×	×	×	×	×	×
Karassavidou et al. 2009	×	*	×	×	×	×	×	×	×
Kim & Choi, 1999	*	×	*	*	×	×	×	×	×
Lim & Tang, 2000	*	*	×	×	×	×	*	×	×
Tomes & Ng, 1995	×	*	*	×	×	×	×	×	×
Taner & Antony 2006	*	×	×	×	×	×	×	*	×
Sower et al., 2001	×	×	×	*	×	×	×	×	×
Yourssef et al., 1995	*	×	*	×	×	×	×	×	×
Zifko-Baliga & Kramph, 1997	×	×	×	×	×	*	×	*	×
Rose et al., 2004	×	*	×	×	*	×	×	×	×
Gross & Nirel, 1998	×	×	×	×	*	×	×	*	×
Evans et al., 1999	×	×	×	×	×	×	×	×	*
Reidenbach et al., 1990	×	*	*	×	*	×	×	×	×
Donabedian, 1980	×	×	×	*	*	×	×	×	×

Wicks & Chin (2008) reported that overall customer satisfaction with an outpatient centre's services was influenced by eleven factors (assurance, empathy, communication, competence, confidentiality, convenience, courtesy, reliability, responsiveness, security, and tangibles). Customers experience has been categorised into three different satisfactions i.e. (i) pre-process satisfaction (ii) process satisfaction and (ii) post-process satisfaction. In this three stages of satisfaction, the second one i.e., (process

satisfaction) had the highest impact on the customers overall satisfaction with the entire service process. According to Wu, Liu & Hsu (2008) reported that in the scenario of health care services both perceived service quality and customer perceived value are decessor of satisfaction and behavioural intentions. Hardeep & Madhu (2012) found that perceived service quality and customer loyalty have optimistic influence on brand equity in healthcare sector. Perceived quality has direct and indirect (through perceived value and satisfaction) impacts on behavioural intentions. In the same way, perceived value has direct and indirect (through satisfaction) effects on behavioural intentions.

### **3.4 Customer perceived value**

Zeithaml (1988) defined customer perceived value as “overall assessment of consumers towards product/services utility, based on varied benefits and sacrifices”. In layman’s language, we can say that consumer’s overall appraisal of the function of a product/service, depends on sensitivity of what is received and given. Since what is received and given varies across consumers, consumer perceived value represents a exchange between sacrifice and benefit components of a product. The sacrifice component relates to the sacrifice made by consumers in terms monetary and non-monetary elements such as time, energy, or efforts. Researchers have used variety of words to describe the theory of customer perceived value. These include perceived value (Chang & Wildt, 1994), value for the customer (Reichheld, 1996), value (Ruyter et al., 1997) customer perceived value (Gronroos, 1997), customer value (Woodruff, 1997; Holbrook, 1999; Oh, 2003), value for money (Sweeney et al., 1999), perceived service value (LeBlanc & Nguyen, 1999), buyer value (Slater & Narver, 2000) and perceived customer value (Chen & Dubinsky, 2003). All these theories are interrelated and positive similarities. Value is measured as natural in service/product handling by buyer. Later, it is somewhat perceived by consumers and instinctively determined.

Although influential contributions by Holbrook & Corfman (1985), Monroe and Krishnan (1985), and Zeithaml (1988) had already existed for some time, the concept of customer perceived value did not emerge as an issue of growing interest to academia and practice until the early 1990s. However, founded as it is on the notion of value per se (“theory of value” by Holbrook, 1999; Oliver, 2010), customer perceived value is far from being a new concept (Eggert & Ulaga, 2002), with roots in diverse research fields and theoretical perspectives (Graf & Maas, 2008; Payne & Holt, 2001; Salem Khalifa, 2004). In fact, considerable links to psychology and social psychology (Holbrook, 1994), as well

as to marketing research (Zeithaml, 1988) exist, which contribute to strong terminological heterogeneity. Most commonly used (Woodall, 2003) are “customer value” (Salem Khalifa, 2004; Woodruff, 1997), “perceived value” (Agarwal & Teas, 2001; Patterson & Spreng, 1997; Sanchez-Fernandez et al., 2007), or “value” alone (De Ruyter, et al., 1997; Desarbo, et al., 2001). Examples for demand-side notions of value, with roots in both marketing and consumer behavior research (Woodall, 2003), are “value for the customer” (Reichheld, 1996; Woodall, 2003), “customer perceived value” (Eggert & Ulaga, 2002; Yang & Peterson, 2004), “perceived customer value” (Chen & Dubinsky, 2003; Sinha & DeSarbo, 1998), “consumption value” (Sheth, et al., 1991), “consumer value” (Jensen, 2001; Sánchez-Fernández et al., 2009), “consumer surplus” (Anderson & Narus, 1995), “subjective expected value” (Bolton, 1998), and “net customer value” (Butz & Goodstein, 1996). Along with this terminological heterogeneity, contradictory and inconclusive views persist regarding the conceptualization and measurement of customer perceived value (Gallarza, et al., 2011; Patterson & Spreng, 1997; Sánchez-Fernández & Iniesta-Bonillo, 2006; Ulaga & Chacour, 2001). In this regard, Payne & Holt (2001) state: “More work needs to be done in the whole area of measurement and development of metrics around the value process, including the further development of specific tools for value measurement for each activity in the value process. We view this as one of the most important areas for future research.” or as LeroiWerelds et al. (2014) recently put it “there is a pressing need for further understanding of how value should be measured.” Such a stringent measurement requires the clear conceptualization of customer perceived value. However, up to now, categorizations into both uni- and multidimensional concepts (Boetsch, 2008; Leroi-Werelds & Streukens, 2011; Lin, et al., 2005; Petrick, 2002; Ruiz, et al., 2008; Sánchez-Fernández & Iniesta-Bonillo, 2006; Sanchez-Fernandez & Iniesta-Bonillo, 2007).

### **3.4.1 Customer perceived value in healthcare**

More number of investigators and academicians has examined the role of customer perceived value in consumption of service contexts. As pointed out by Bolton & Drew (1991) perceived value is a “richer, more comprehensive measure of customers’ overall evaluation of a service than service quality”. Zeithaml (1988) defines perceived value as the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given and his research provide evidence to support a dominant role of perceived value in consumers’ purchase decision making. Customer perceived value is widely regarded as a key source of competitive advantage in the twenty-first century

(Eggert & Ulaga, 2002; Gale, 1994; Payne & Holt, 2001). According to the Zeithaml's (1988) end model customer perceived value is a direct antecedent of a service consumption decision and a direct consequence of perceived service quality. Dodds et al. (1991) described customer perceived value as a trade-off between perceived quality and perceived psychological as well as monetary sacrifice (Dodds & Monroe, 1985; Monroe & Chapman, 1987; Teas & Agarwal, 1997). Their model suggests that customer perceived value is a direct antecedent of consumer purchase intention. Another research Woodruff (1997) laid out a customer value hierarchy model in which customer perceived value was viewed as a hierarchically structured construct at levels of consumption goals, consequences, and attributes. According to Woodruff, customer perceived value resides in every stage/level of customers' expectancy-disconfirmation process. Slater (1997) and Parasuraman (1997) provided support for the role of customer perceived value in understanding consumer behaviour. Some other research literature has reported on customer perceived value based on economic value and consumer behavioural theories, Jayanti & Ghosh (1996) formulated customer perceived value as a direct consequence of perceived service quality as well as of cost-based transaction and acquisition utilities. A subsequent investigation of their hypotheses in the service sector supported the role of value for understanding customers. Bojanic (1996) also examined the relationship of customer perceived value with price, quality, and satisfaction.

In recent years, customer perceived service value has been emphasized due to its role as a mediating variable in the relationship between service quality and customer satisfaction (Bolton & Drew, 1991). They also support the idea that there is a strong relationship between perceived value and customer satisfaction. Consequently, it would be seem that service value plays a key role in the relationship between service value and customer satisfaction as a mediating variable. Perceived value has been known as a mediating variable in the relationship between service quality and customer satisfaction. The relationship between customer perceived value and customer satisfaction is also critical as they are linked to market share, relationship marketing, and future re-purchase intentions (Patterson & Spreng, 1997). Moreover, service value is critical for marketing scholars since it may change the direction (satisfied/dissatisfied) and the degree or intensity of satisfaction/dissatisfaction experienced (Spreng et al., 1993). Accordingly, there appears to be a consensus that perceived service value has a positive effect on overall customer satisfaction (Fornell et al., 1996; Lee & Kim, 1999; Zins, 2001).

**Table 3.3: Customer perceived value dimensions**

Author	Year	Dimensions
Zeithaml	1988	Salient intrinsic attributes, extrinsic attributes, perceived quality, other relevant high level abstractions, price (monetary and non monetary)
Sheth et al.	1991	Functional, social, emotional, epistemic and conditional value
Dodds et al.	1991	Acquisition value, willingness to buy, transaction value
De Ruyter et al.	1997	Emotional value (5), practical value (5), logical value (5)
Grewal et al.	1998	Acquisition value, transaction value
Vigneron & Johnson	1999	Prestigious brand selection, conspicuous value, unique value, social value, emotional value, and quality value
Holbrook	1999	Efficiency, excellence, play, aesthetics, esteem, status, esthetics, spirituality
Phau & Prendergast	2000	Perceived quality, brand awareness and brand identity
Parasuraman & Grewal	2000	Acquisition value, transaction value, redemption value and in-use value
Yoo & Donthu	2001	Brand loyalty, perceived quality, and brand awareness/association
Corbin et al.	2001	Benefit value, cost value
Sweeney & Soutar	2001	Emotional value (5), social value (4), functional value (quality) (6), functional value (price) (4)
Mathwick et al	2001	Visual appeal (3), entertainment (3), escapism (3), enjoyment (2) efficiency (3), economic value (3)
Mathwick et al.	2002	Economic value, efficiency value, enjoyment, escapism, entertainment, visual appeal and service excellence
Arnold & Reynolds	2003	Adventure, gratification, role, value, social idea shopping
Wang et al.	2004	Functional value (4), emotional value (5), social value (3), perceived sacrifices (6)
Liu et al	2005	Core service (3), support service (4), economic value (3)
Lin et al	2005	Acquisition value, service value, and value for money.

Pura	2005	Social value (3), emotional value (2), epistemic value (3), conditional value (2)
Carlos Fandos Roig et al.	2006	Functional value establishment (4), functional value contact personnel (4), functional value service (4), functional value price (3), emotional value (5), social value (2)
Sánchez-Fernández & IniestaBonillo	2006	Functional value establishment (4), functional value personnel (4), functional value product (4), functional value price (3), emotional value (5), social value (4)
Whittaker et al.,	2007	Functional value (6), epistemic value (3), image (5), emotional value (3), price/quality (3), social value (2)
Ekrem & Fazil	2007	Functional value, emotional value, social value
Philström & Brush	2008	Monetary value (3), convenience value (6), emotional value (4), social value (3)
Sánchez-Fernández et al.	2009	Efficiency (5), quality (4), social value (3), play (4), esthetics (4), altruistic value (4)
Kim, et al.,	2010	Physical value, economic value, expressive/social value, emotional value, and service value.

### 3.4.2 Consumers' perceived value in Indian scenario

Organizations, working in Indian healthcare service sector, experience much more difficult market dynamics. Particularly with increasing number of refined consumers on one hand and the extant heterogeneous market with deviate consumer characteristics on the other hand. The upcoming educated consumer segment in Indian scenario are seem to be more value alert and are willing to pay premium price to get non-economical value benefits. In this context, Moser et al. (2010) remarked that “Indian consumer has grown from being a price driven buyer to a more sharp consumer who needs to be convinced about the product/service quality” and hence wary off with the straight wisdom that Indian consumers consider the cost of the service/product as the main criterion for purchase decision. Recently international strategic consultants, Customer Value Foundation (2012) also find that Indian consumers see value when providers/sellers offered services that complement their own value systems on physical, rational and emotional planes. To



understand this competitive market, it becomes utmost for the service providers to go beyond delivering services via understanding consumers' needs and expectations, and providers should offer them high value as per customer expectations as considerate their perception is critical for their success in the extant heterogeneous but competitive market.

### **3.5 Customer Satisfaction**

The concept of customer satisfaction has drawn the interest of academics and research scholars for more than three decades and the fact is that customers are the primary source of any organisations' revenue. Customer satisfaction is a necessary precondition for customer loyalty, which is in turn a key driver of profit growth and performance (Reichheld & Aspinall 1993; Heskett et al. 1997). Churchill & Surprenant (1982) define customer satisfaction as an outcome of purchase and use resulting from the buyers' comparison of the rewards and costs of the purchase in relation to the anticipated consequences. It has also been viewed as an emotional state that occurs in response to the evaluation of services (Westbrook 1981). The former conceptualisation recognises that satisfaction is determined by a association process of comparing what customers receive (rewards) against what they give up to acquire the service (costs) whereas the latter views satisfaction as an emotional feeling resulting from an evaluative process. Consistent with this view, customer satisfaction is defined as an emotional response, which results from a cognitive process of evaluating the service received against the costs of obtaining the service (Woodruff et al. 1991; Rust & Oliver 1994).

Customer satisfaction is explained as a measurement of various dimensions in healthcare. It is considered as central outcome of care, which provides vital information to measure and improving healthcare quality (Naidu 2009). According to Alrubaiee & Alkaa'ida (2011), "Patient's satisfaction can be studied in the context of their overall experience in a healthcare setting ... a psychological notion that can be easily understood but is difficult to define." The role of customer satisfaction in healthcare industry is very significant as it leads to positive results, such as high customer retention rates, positive word-of-mouth publicity, and increased profits (Peyrot, Cooper & Schnapf 1993; Zeithaml 2000). The satisfaction level of customers and their accompanying persons or relatives is a very effective indicator to analyze the performance of a hospital setup so it is required by the hospital management to take the necessary efforts to retain the old customers, as it is very difficult to gain new customers (Desai, Nahar & Bansal 2012). For private healthcare

service providers, customer satisfaction is an important aspect to benefit the high competitive advantage (Kondasani & Panda 2015).

Customer satisfaction work of Hulka et al. (1970) started the initial steps to measure satisfaction in the healthcare area with the development of the “Satisfaction with Physician and Primary Care Scale”. This was followed by Ware & Snyder (1975) with their “customer Satisfaction Questionnaire”, aimed at assisting with the planning, administration and evaluation of healthcare service delivery programs. At the end of the 1970s, the “Customer Satisfaction Questionnaire” was developed by Larsen et al. (1979) as an eight-item scale for assessing general customer satisfaction with healthcare services, and was superseded by their “Patient Satisfaction Scale” (1984). Since that time, numerous instruments have been developed but the question remains as to how valid and reliable those instruments really are. Further, the measurement of satisfaction varies depending on the assumptions that are made as to what satisfaction means (Gilbert et al., 2004) and a number of approaches to measurement can be identified: expectancy-disconfirmation; performance only; technical-functional crack; satisfaction versus service quality; and customer attribute importance (Gilbert & Veloutsou, 2006). The health care sector has experienced dynamic and dramatic changes. The future of the health care industry is even unpredictable. However, there are certain factors that will be continuously important in health care in the future. One of them is to emphasize customer satisfaction. In any competitive industry, customer satisfaction is critically important, and patient satisfaction is now considered as customer satisfaction in health care. Even though some argue that patient satisfaction is influenced by a bedside manner and patients cannot evaluate the true quality of care, patient satisfaction studies receive more and more attention for several reasons. First, satisfied patients bring business. They are now more empowered, and express their preference over health care providers. Most customer satisfaction studies put an emphasis on finding key dimensions to increase overall customer satisfaction. However, it is not clear how much health care managers need to improve certain dimensions to attain the target overall customer satisfaction level.

### **3.5.1 The application of customer satisfaction in healthcare**

The application of customer satisfaction in healthcare has drawn the interest of academics and practitioners for more than two decades and the fact is that customers are the chief source of hospitals revenue. Customer satisfaction is a necessary precondition for customer loyalty as well as positive behavioural intentions, which is in turn a key driver of

profit growth and performance (Reichheld 1993; Heskett et al. 1997). The need for the measurement of customer satisfaction has been largely driven by the underlying politics of “new public management” (Hood, 1995) and the concomitant rise in the health consumer movement, with customer satisfaction being one of the articulated goals of healthcare delivery. With the advent of the customer privileges movement (Williams, 1994), the debate over the relationship between customer satisfaction as a valuation of the process of care versus the standard of technical care was well established. As a result, the use of customer satisfaction measures in the health sector became increasingly widespread. For example, assessing and managing customer satisfaction has been mandatory for some developed countries hospitals like French hospitals since 1998, which was used to improve the hospital environment, customer amenities and facilities in a consumer perspective sense, but this may not necessarily to lead to high care (Boyer et al., 2006).

Whilst there is numerous specific customer satisfaction studies published in peer reviewed journals, there is a smaller body of work which critically reviews the literature and analyses the construct and its use. Most studies of the determinants of patient satisfaction have focused on the cognitive attributes of health care service, such as tangible hospital facilities (Wicks & Chin, 2008); responsiveness (Andaleeb, 2001); assurance (Wicks & Chin, 2008); and communication (Andaleeb, 2001). This work highlights agreement that customer satisfaction suffers from inadequate conceptualisation of the construct, a situation that has not changed significantly since the 1970s, and there is no agreed definition (Hawthorne, 2006). Crowe et al. (2002) identified 37 studies investigating methodological issues and 138 studies investigated the determinants of customer satisfaction. They indicated that there is agreement that the definitive conceptualisation of satisfaction with healthcare has still not been achieved and that understanding the process by which a customer becomes satisfied or dissatisfied remains unanswered. They suggest that customer satisfaction is a relative concept and that it only implies adequate service. Further, both Crowe et al.(2002) and Urden (2002) separately point out that customer satisfaction is a cognitive evaluation of the service that is emotionally affected, and it is an individual perception. Crowe et al. (2002) also highlight that there is consistent evidence across settings that the most important determinants of satisfaction are the interpersonal relationships and their related aspects of healthcare. What is agreed is that satisfaction has become an endpoint in customer outcome research and it is the benchmark for service sector. Customer satisfaction has come to be seen as a part of

health outcome quality which also encompasses the clinical results, economic measures and health related quality of life (Heidegger et al., 2006).

### **3.5.2 Customer satisfaction and perceived service quality in healthcare**

Dimensions of customers' perceptions of perceived service quality has been limited (Clemes et al., 2001), research studies seeking to measure the components of the quality of care in healthcare services predominately continue to measure customer satisfaction (Lee et al., 2006). There is no compromise on how to best conceptualise the relationship between customer satisfaction and perceptions of the quality of private healthcare. According to O'Connor & Shewchuk (2003) emphasised that much of the work on customer satisfaction is based on descriptive and correlation analyses without theoretical structure. They concluded that, with regard to health services, the focus should be on measuring two types of quality i.e. technical and functional quality and not customer satisfaction. A study by Gotlieb et al. (1994) on customer discharge pattern, hospital perceived service quality and satisfaction offered evidence of a clear division between these constructs. They found that customer satisfaction mediated the effect of perceived service quality on behavioural intentions, which included loyalty to treatment regimes and following service provider recommendation. Cleary & Edgman-Levitan (1997) pointed out that "satisfaction surveys in the health care sector did not measure quality of care as they did not include important aspects of care items such as being treated with respect and being involved in treatment decisions". In addition, Bansal & Taylor (1999) highlighted that "confusion continued in healthcare sector regarding the differentiation of service quality from satisfaction" and reported by some researchers like, Kleinsorge & Koenig (1991), referred to them as synonymous terms. Nevertheless customer satisfaction continues to be measured as a proxy for assessment of service quality (Turriss, 2005).

### **3.6 Customer Loyalty**

In our research study's another dependent variable was loyalty, which indicates whether a customer will return or not to that particular hospital. Customers frequently develop an attitude towards purchasing based on a prior service experience. They also undergo a cognitive decision-making process about whether to stay with or leave a service (Zeithaml, 2000). Oliver (1997) referred to loyalty as the stated likelihood to engage in a particular behaviour. Loyalty is considered to include a willingness to revisit and positive word-of-mouth (WOM) intentions. Zeithaml et al. (1996) grouped behavioural intentions into favourable: positive feedback, recommending, remaining loyal and paying more, and

unfavourable loyalty as negative feedback, switching to another organisation, complaining to external agencies and doing less business with a company. Positive WOM is proven to be the strongest predictor for shaping future behaviour and attitudes, which includes oral, person-to-person communication between a receiver and a communicator whom the receiver perceives as non-commercial, regarding a brand product or service (Buttle, 1998). Willingness to pay more is the customer's intention to pay a higher price than competitors charge for the benefits that the customer currently receives from the service provider. Zeithaml et al. (1996) use willingness to pay as a behavioural proxy for value. A customer who has a stronger bond with a specific provider (e.g. loyal customer) will be willing to pay (WPM) higher prices based on value provided by that provider's products and services (Bigné et al., 2008). Several studies investigated service quality and satisfaction's direct effect on loyalty. Findings indicate that service quality and satisfaction has a direct relationship with WOM and WPM (Ladhari, 2009; Hanzae & Shojaei, 2011)

Customer loyalty is approached as both an attitudinal and a behavioral concept. As an attitudinal concept, it denotes the degree to which a consumer's disposition toward a service is favourably inclined. This is reflected, for instance, in the consumer's willingness to recommend a service provider to other consumers consistently over a certain period. Similarly, as a behavioural concept, "it reflects the consumer's commitment to using a preferred service provider despite the existence of financial and location barriers" (De Ruyter et al., 1998). Peltier, Boyt & Sehibrowsky (2000) "considered using the provider again for the same services (UPAS), using the provider again for different services (UPAD), and recommending provider to others (RPO) as three elements of customer loyalty". In contrast, DeRuyter et al. (1998) recognized "preference loyalty, price indifference loyalty, and dissatisfaction response as important determinants of customer loyalty. Preference loyalty includes UPAS and UPAD". Dissatisfaction response and price indifference loyalty are another two elements that relate to loyalty. Hirschman and Holbrook (1982) argued that "dissatisfied consumer has three options for responding to a negative (service) experience: communicate dissatisfaction (voice), continue using the services without communicating to the concerned authority, or discontinue the relationship (exit)". Consumers who voice against their dissatisfaction may complain to the service providers, or to its workforce, or external agencies such as consumer organizations and those customers' may remain with the organization if the problem is solved. In the healthcare sector, "the majority of consumers simply remain inactive and do not undertake

any action following a negative service experience” (Day, 1994). Furthermore, it has been argued that actually responding to dissatisfaction by complaining directly to the hospital management or complaining to a third party agencies is negatively correlated to the point of service quality and also influence loyalty. Lastly, price unresponsiveness loyalty is the willingness to pay a premium price for a service (DeRuyter et al., 1998). Zeithaml (1988) reported that “positive relationship between service quality and the willingness to pay a higher price and the intention to remain loyal in case of a price increase”. In the healthcare sector, particularly private healthcare organizations, price indifference loyalty is preferred for the same hospital over competitors even if the fees for medical services/treatment are high. A five-factor model comprising customer perceived service quality, customer perceived value, customer satisfaction, loyalty and behavioural intention was used to measure and manage service quality in the present study.

### **3.7 Behavioural Intention**

In our research study we proposes behavioural intentions to be another dependent variable as this indicates whether a customer will recommend this hospital to others or not. Behavioural intentions are the most important indicators of customer future behaviours for any service or product oriented organisations. Zeithaml et al., (1996) grouped behavioural intentions into favourable behavioural intentions—positive WOM, recommending, remaining loyal and pay more—and unfavourable behavioural intentions—negative WOM, switching to another organization, complaining to external agencies and less business with company. Positive WOM communication is one of the strongest predictors for change the consumers’ behaviours in favour of the organization. In the context of the health care if a customer is satisfied with a hospital he might recommend the hospital to other patients or friends. If the customer is highly satisfied with the paper work like registration process, admissions formalities, discharge documentations and other similar activities related to treatment, it will lead to customers suggesting to that hospital to others (Kessler & Mylod, 2011). In India peer groups and family members have high influence on customers when it comes to making decisions to patronize a services institution and particularly private hospitals. In this context if a customer has a stronger bond with a specific health care service provider will be willing to pay more otherwise called as WPM. WOM and WPM are considered to be post-consumption effects.

### **3.8 Relationship between perceived service quality, customer perceived value, satisfaction, loyalty and behavioural intentions**

The importance of customer loyalty is achieving organisation ambitions and its force on business feat is widely acknowledged by researchers (Anderson et al., 1994). “Customer loyalty is an outcome of customer perceived value and is a fundamental indicator of a organisation past, current, and future performance” (Lam et al., 2004). According to the “disconfirmation paradigm, a consumer’s degree of overall loyalty is a function of the value the consumer expects in relation to the value actually received” (Gounaris et al., 2007). Although the disconfirmation theory been deeply criticized, particularly when it comes to methodology and measurement issues (Cronin & Taylor, 1994; Teas, 1993), its conceptual value and involvement to consider the impact of perceived value upon consumer satisfaction and loyalty remain unquestioned. The “consumer first forms specific expectations regarding the value he or she wishes to receive and anticipates receiving from the service and becomes satisfied when receiving adequate doses of value from the products/services that customers may buys”. Post-purchase experiences reveal the level of value each individual accumulates from the choice he or she has made (CPV). When customer perceived value exceeds their expectations, the consumer is satisfied (Anderson et al., 1994; Oliver, 1981), and the same thing over a period of time leads to loyalty (Ravald & Gronroos, 1996). Findings from Wang, Lo, Chi, and Yang (2004) revealed in their research that satisfaction and loyalty are related to customer perceived value. However, customer perceived value comprises fundamentals that carry positive and negative value for the consumer, it follows that positive utility elements will serve as satisfaction drivers, whereas the negative utility elements will decrease the overall consumer’s satisfaction with the service.

Although many researchers and academicians have scrutinized the relationship between customer satisfaction, perceived service quality and behavioural intentions throughout the world, but there is no research work that investigates the declared relationship in the Indian private healthcare sector was found. Thus, this piece of research work attempts to examine the mediation effect of customer satisfaction towards the relationship between perceived service quality and behavioural intention. Smith and Swinehart (2001) found that “there is very strong link between service quality and satisfaction”. It was also believed that “customer service is a prerequisite for customer satisfaction” (Newman, Maylor & Chansarkar, 2001). According to Ahmad Azmi &

Norzalita (2008), found that hospital services known as “HOSPIQUAL”. They also noted that HOSPIQUAL affects the customer satisfaction of public and private health care services in Kuala Lumpur and Johore, Malaysia. Research in UAE revealed that perceived health care quality has a positive weight on customer satisfaction (Badri, Attia, & Ustadi, 2009). Navid et al., (2010) who conducted a research among the international patients who received treatment in Penang private hospitals in Malaysia concluded that “all service quality dimensions have a positive relationship with customer satisfaction”. According to Mpinganjira (2011), “overall perceived service quality has a positive relationship with patient satisfaction”. The effect of service quality on behavioural intention takes on different forms: direct effect, indirect effect and total effect through satisfaction, or moderating effect by satisfaction (Falk, et al., 2010; Bou-Llusar et al., 2001; Woodside et al., 1989). For the direct effect, various research studies in various industries and sectors have shown that service quality is an antecedent to behavioural intentions (Li, et al., 2011; Boshoff & Gray, 2004; Bou-Llusar et al., 2001); Parasuraman et al., 1985, 1988; Zeithaml et al., 1996). In health care settings, many confirmations have shown that the direct impact exists between quality, satisfaction and behavioural intention (Wu, Liu, & Hsu, 2008; O’Connor, et al., 2000; Gooding, 1995). Whenever the customers’ perception of service quality was high, the behavioural intentions of them was favourable, which build up their relationship with the hospital. In the other industries like banking, financial services, insurance etc, “the perceived service quality constructs are directly and positively related with repeat purchase intention, customer loyalty and willingness to pay more money” (Baker & Crompton, 2000).

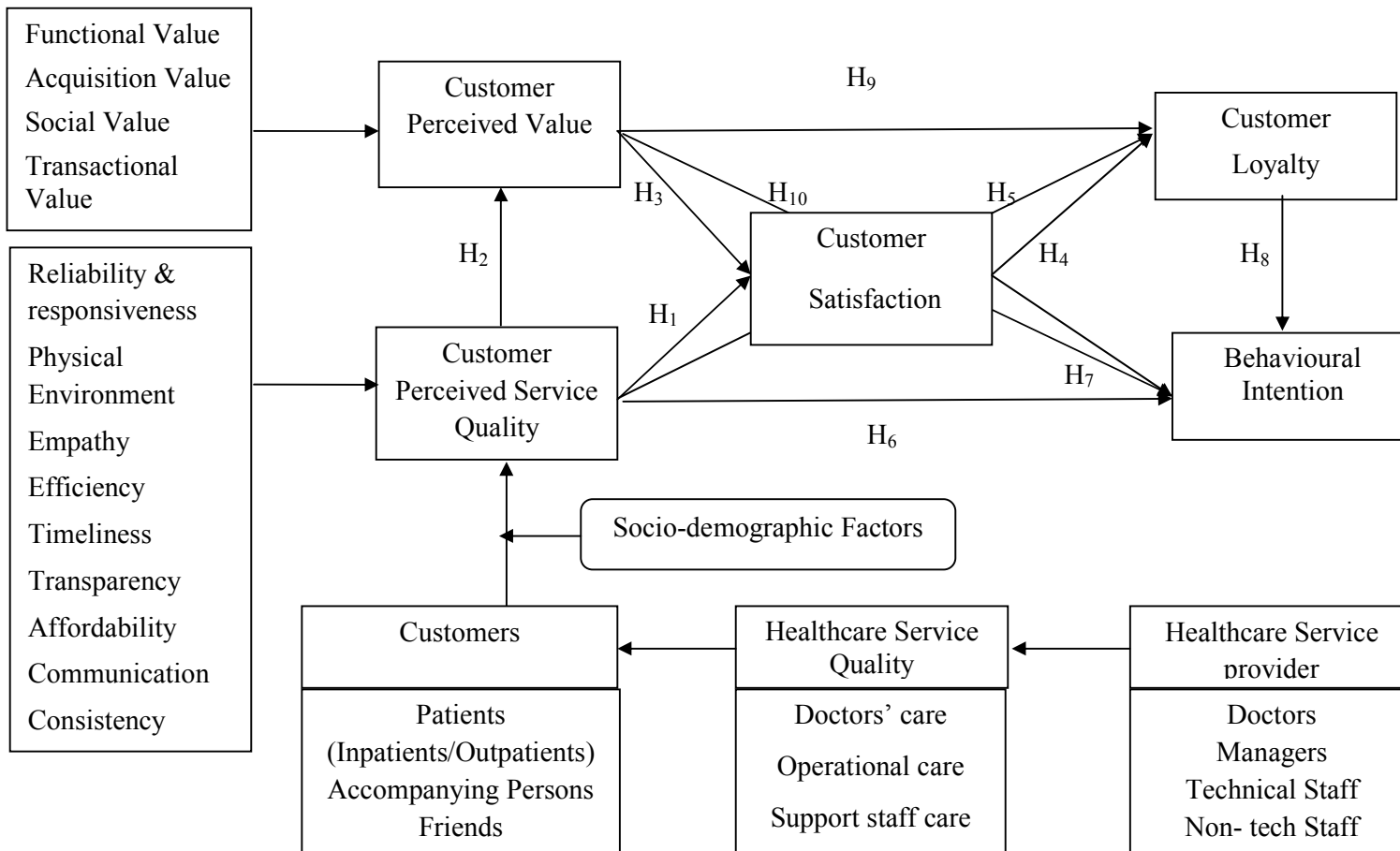
Satisfaction is found to positively affect behaviour intentions (Bendall-Lyon & Powers, 2004; Otani & Harris, 2004). “Satisfied customers are willing to re-visit to the same service provider and to strongly recommend services to families and friends” (Elluech, 2008). Mpingajira (2008) indicated that “patients overall satisfaction is a good mediating variable between service quality perceptions and positive behavioural intentions”. The results provide further support to research findings by other researchers such as Anderson, et al., (1994); Brady & Robertson, (2001) and Dagger and Sweeney, 2007. Bou-Llusar et al. (2001) to test the relationships among quality perception, satisfaction, and behavioural intentions. The results showed that customer satisfaction mediate the relationship between perceived service quality and behavioural intentions. Evidence of the mediating effect of satisfaction has been found in many service industries including healthcare setting (O’Connor, et al., 1991; Shemwell, et al., 1998; Zeithaml et



al., 1996; Olsen, 2002; Gonzalez, et al., 2007; Wu et al., 2008;). Other researchers however agreed that service quality is a cognitive dimension while satisfaction is a cognitive as well as affective dimension. They suggested that “satisfaction is a construct that mediates the effect of service quality perception on behavioural intentions and other outcomes such as customer trust” (Brady & Robertson, 2001; Bigne et al., 2003; Choi et al., 2005; Alrubaiee & Alkaa'id, 2011). In other study (Lo, Osman, et al., 2010), the researchers found that “satisfaction has a mediating effect on the relationships between service quality dimensions and customer loyalty”. This result is similar with studies done by Butcher et al., (2001), Caruana (2002), Ehigie (2006) and Lam & Burton (2006). In 2011, Alrubaiee & Alkaa'ida who found their research in Jordan suggest the mediating effects of customer satisfaction in the association of healthcare quality and customer trust.

### **3.9 Gap in literature**

Majority of research studies on customer perceived service quality (Carman, 1990; Andaleeb, 1998; Baltussen, et al., 2002;) were carried out in the developed countries (USA, UK, Malaysia etc) context, which cannot be generalised into Indian scenario. Very less number of research work in Indian context (Rao et al, 2006; Aagja & Garg, 2010; D'Souza & Sequeira 2012;) were carried out where they found that service quality analysis gives an opportunity to customers to voice their view about the perceived healthcare services in private sector. There is a lack of evidence in understanding the customer perceived service quality; customer perceived value with mediating role of customer satisfaction to customer loyalty and behavioural intention in the context of e private healthcare sector in India. Although few studies have explored service quality issues in private healthcare sector, no study has bring forward the preferred private healthcare setting and the issues of customer loyalty and behavioural intentions in smaller healthcare set up like non corporate hospitals. Prioritization of service quality dimensions is also being explored in very few studies whereas we have used robust mathematical tools and techniques to do so. Our study also adequates that perceived service by customer in healthcare present inputs for the healthcare organisation to advance its aspects of service quality. This piece of research work investigates the diverse factors affecting service quality in private healthcare sector by a new conceptual model based on Indian private hospitals quality. It further attempts to explore the direction of relationships between perceived service quality, customer perceived value customer satisfaction, customer loyalty and behavioural intentions of service providers through customers' perspective.



**Figure 3.2:** Proposed hypothesized model for managing customer perceived service quality

### **3.10 Conclusion**

The literature on customer perceived service quality has acknowledged the importance of healthcare service quality dimensions along with their positive effects on customer perceived value, customer satisfaction, loyalty and behavioural intention of the customers. Consequently, there is much to be gained from the understanding of how customer of hospital benefits for appropriate identification of quality dimensions. Despite decades of scientific research on various service quality dimensions are essential for continuous quality improvement, it lacks in developing a customer perceived service quality dimensions which can allow healthcare providers and hospitals in the way of degree of flexibility to the hospital and customer specific manner.

Perceived service quality concern in private healthcare have caught escalating alertness since last three decades. But, in the last two decades the theory has been shifted to customer's perspectives particularly in private healthcare. Thus, service providers identify different construct of service quality that fluctuate from the traditional service quality constructs. Healthcare service quality as a role of customers' self-reported experience of care is considered as a valuable quality measurement metric. The widespread survey recognizes numerous models of perceived health care quality worldwide. In India, empirical studies have been conceded out to recognize the customer's perception (Rao et al, 2006; Senthil & Prabhakaran, 2011; Padma et al., 2009; Kondasani & Panda, 2015; etc). Few research studies have taken case method in Indian healthcare organizations to measure the customer perceived service quality (D'souza & Sequeira, 2012; Sodani et al., 2010). Most of the research on managing customer perceived service quality in the private healthcare sector has been limited to developed countries. There is a lack of evidence in understanding the customer perceived service quality; customer perceived value with mediating role of customer satisfaction to customer loyalty and behavioural intention in the context of exclusive private healthcare sector in India.

## **Chapter 4**

# **Research Methodology**

### **4.1 Introduction**

Literature review on customer perceived service quality and customer perceived value based on Indian private healthcare setting was described in the previous chapter. The importance of customer satisfaction, customer loyalty and behavioral intention to influence and improve the overall hospital performance and capabilities was also highlighted. This chapter of the thesis summarizes research methodology which reflects about research setting, the universe of the study, sampling method, and determination of sample size, data sources and questionnaire design. It is followed by the essential research tools and techniques that have been applied to successfully validate the research objectives and hypotheses.

### **4.2 Research Setting**

Research is an art of scientific investigation, which deals with the systematized effort to gain new knowledge and information. It comprises of numerous systematic activities such as; defining and redefining problems, formulation of hypotheses, collecting, organizing data, evaluating and interpreting data, making deductions and reaching to a conclusion. The research design and methodologies for the research process needs to be pre-set before the real execution. For systematic implementation of research, this section has been subdivided into the following five sub-sections.

#### **4.2.1 Research Design**

To thoroughly investigate the research problem in our research, descriptive research design has been used. Auberbach & Silverstein (2003), has described “The descriptive research attempts to describe, explain and interpret conditions of the present i.e. ‘what is’. The purpose of a descriptive research is to examine a phenomenon that is occurring at a specific place and time. A descriptive research is concerned with conditions, practices, structures, differences or relationships that exist, opinions held processes that are going on or trends that are evident”. Descriptive work consists of three main categories such as; observational research, case methods and survey research. These works have been used in previous research work to analyze the factors of the research problem effectively.

The present work adopts exploratory research methods, as we are seeking to generate meaningful hypothesis by examining collected dataset and looking for building relations between the variables. When the purpose of research is to gain familiarity with a phenomenon or acquire new insight into it, in order to formulate a more precise problem or develop hypothesis, the exploratory research come in handy. If the theory happens to be too general or too specific, a hypothesis cannot be formulated. Exploratory research is also helpful in formulating relevant hypotheses for more definite investigation (Shields & Rangarjan, 2013).

#### **4.2.2 Research Universe**

The purpose of our empirical study is to manage and assess the customer perceived service quality in private healthcare sector, so the service providers can absorb and examine the essential service quality dimensions that the healthcare managers of the private healthcare sector can implement so as to enhance performance. In addition to get an insight on this area which is relatively less explored in Indian context, twelve private hospitals were surveyed. These private healthcare service providers are located in eastern Indian state of Odisha and southern states of Andhra Pradesh and Telangana. Both primary and secondary data sources along with various multivariate techniques were applied together to analyze and validate the hypotheses proposed in the study.

#### **4.2.3 Development of the Questionnaire**

The process of designing the questionnaire is as follows. Whenever previously used scales were available, they were first screened by the researcher for their easy interpretability in the Indian private healthcare context. Where appropriate scales were not found, new ones were designed subjected to the scrutiny of the hospital acquaintances. This was followed by a formal test run in one hospital of each ownership type. During the test run, in addition to an intensive questionnaire survey supplemented with occasional interviews, several respondents sat with the researcher and answered each question. This process helped the researcher not only to know how respondents understood the questions, but also to appreciate how this understanding differed across ownership types and between doctors and support staffs. The analysis of the test run results pointed to the need for further changes. A changed format was then prepared and tried out on a different set of hospital acquaintances. In order to further ensure its easy understandability, this changed format was translated into a colloquial form of the vernacular (Odiya and Telugu). When this was

difficult to do, it was assumed that the wording was too abstract. The question was then recast till it could be satisfactorily translated into colloquial Odiya and Telugu.

#### 4.2.4 Sampling Plan

Selection of samples and data collection is the most important part of research study as it is not feasible to contain all populace in the study. Thus, it is significant to draw out data samples that can take the satisfactory size of population. Simple random sampling method is used as probability sampling for availing respondents opinion on the subject whereas convenience and judgmental sampling is used as non-probability sampling for selection for hospitals. The simple random sampling method is fitting for this research as it undertakes to limit the possible data to those which are “less extreme” by insuring that all sections of the populace are corresponding to the data in order to increase the effectiveness, by minimizing the error of probability (Agresti & Finlay, 2008). The respondents of the structured questionnaire were mainly the customers (patients) of the Indian private healthcare setting. As a group of sample data was brought into reflection therefore, it was important that the data collected for the purpose were enough for interpreting the research results. Data size refers to the number of elements to be included in the study. Determining the sample size is difficult and it involves numerous qualitative as well as quantitative reflections to the research study. Some important qualitative dimensions that should be measured in formulating the data size includes the significance of the judgment, environment of the investigation, number of items, nature of the analysis, data size used in familiar works and resource constraints. The final sample size for customers is determined using the following formula by Charan & Biswas, 2013.

$$N = (Z\text{-score})^2 * \text{Std. Dev.} * (1\text{-Std.Dev.}) / (\text{margin of error})^2$$

In our study, 95 percent confidence level is taken for which the Z value is 1.96 according to the normal distribution table. In this research 0.5 to be assumed value of standard deviation and the margin of error would be  $\pm 5\%$ . Therefore, we have calculated N, we have assumed (Z-score = 1.96, Standard Deviation = 0.5, margin of error =  $\pm 0.5$ ).

$$\begin{aligned} N &= \{(1.96)^2 \times .5(.5)\} / (.05)^2 \\ &= (3.8416 \times .25) / .0025 \\ &= 0.9604 / .0025 \\ N &= 384.16 \end{aligned}$$

Based on the above formula interpretation of lowest amount of sample size should be 384. It would enable the estimation and influence of customer perceived service quality on private healthcare setting on a 5 point Likert scale, with 95 percent confidence level and standard error level maintained within  $\pm 0.5$  of the value.

#### **4.2.5 Data Collection Procedure**

A number of field research methods namely, e-questionnaire, questionnaires, interviews, systematic observation and analysis were used for collecting data from the respondents. Over a period of five months, June-2013, April – May 2014, September 2015 and April-2016, twelve private hospitals of each ownership type in Odisha (four hospitals), Andhra Pradesh (four hospitals) and Telangana (four hospitals) were visited by the researcher for an average of ten days each. The measuring instrument was used for capturing customers' perceptions of quality of services in the respective hospitals. The questionnaire was translated in Odiya and Telugu using translation and retranslation method along with English version. During the pre-test, the participants were told that the study was a part of a doctoral level research. The participants were told that their participation in this study was voluntary and confidentiality was assured. The complete filling of questionnaire takes about 15 to 20 minutes. The research sample was selected from twelve different private hospitals customers (inpatients, outpatients & accompanying persons) who have been discharged or survived from the disease have been selected for filling questionnaire. Respondents inclusion criteria comprised of customers aged 18 years and above who were admitted at least 24 hours in the hospital (for inpatients) and at least two visits for the hospital (for out-patients) and willing to participate in the filling questionnaire. The sample respondents were chosen randomly in each private hospital and the questionnaires were filled on face to face fashion, where as few e-questionnaires were also sent to respondents after fifteen days of discharge (inpatients) and seven days for outpatients who were not able to fill the questionnaire on the spot.

### **4.3 Research Methods**

#### **4.3.1 AHP analysis**

The AHP is an insightful and relatively straightforward method for formulation and analysis of critical decisions. It illustrated with three key concepts behind it, those are analytic, hierarchy and process. The philosophy behind these three components are briefly described into the following heads:

### ***Analytic***

The AHP analysis simply uses numbers but in the decision making process decision makers using limited numbers in order to arrive at a decision; simply choose the alternative that is most desired. However, there should be a very good reason, why the researcher would like to use mathematical models to identify and/or describe respondent choice to others. In this sense of the word, all mathematical methods which seek to briefly elaborate a decision should be analytic. Hence the researcher should use mathematical/logical reasoning.

### ***Hierarchy***

The AHP structures the decision problem in levels which correspond to one's understanding of the situation: goals, criteria, sub-criteria and alternatives. In our choosing better healthcare setting consists only three levels. The literature (Bard, 1986; Golden, Wasil & Levy; Hamalainen & Seppalainen, 1986; Saaty, 1980; 1982; 1986; Saaty & Vargas 1981; Wind, 1987; Wind & Saaty, 1980; Zahedi, 1986) shows the tremendous complexity which can be dealt with in a hierarchy. By breaking the problem into levels, the decision maker can focus on smaller sets of decisions; evidence from psychology suggests that humans can only compare  $7 \pm 2$  items at a time; the so-called Miller's Law (Miller 1956; Stevens, 1957). Thus, it is vital if we are to deal with complex situations that we use a hierarchy.

### ***Process***

As we know, most decisions which are truly important cannot be made in a single meeting; one cannot expect the AHP to counteract this basic human tendency. People need time to think about a decision, gather new information, negotiate if it is a group decision, etc. Thus, any real decision problem involves a process of learning, debating and revising one's priorities. As envisioned by Saaty, the AHP analysis meant to be used to aid and hopefully cut down this decision procedure through the insights which this analysis can breed; it will never alternate the overall decision practice. The AHP analysis points to where more information is needed, where major points of disagreement lie, etc. also, when one goes through the structured process as in the better healthcare selection example in our research, final result may not agree with customer feelings/thinking. Customers may want to go to corporate hospital or any other. The decision maker must return to the hierarchy at this point in order to see if any true feelings have been misrepresented or it may be that intuitive feelings will change after considering the problem in detail. This process is



necessary and is in fact quite healthy; the AHP analysis is meant to support and not to destroy the natural process of decision making. Therefore, the overall philosophy of AHP analysis is to provide mathematical approach (the analytic part) to aid in the creative, artistic formulation and analysis of a decision problem. Saaty (1980) provides a great deal of insight into both the scientific and artistic nature of this process.

#### 4.3.1.1 Mathematical foundations of the AHP

The first major task in the AHP analysis involves the estimation of the weights of a set of objects (criteria or alternatives) from a matrix of pairwise comparisons  $A = (a_{ij})$  which is positive and reciprocal. Thus given the matrix

$$A = \begin{pmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{nk} & a_{nk} & \dots & a_{nn} \end{pmatrix}$$

where  $a_{ij} = 1/a_{ji}$  for all  $i, j = 1, 2, \dots, n$ ,

then we would like to compute a vector of weights or priorities  $W = (W_1, W_2, \dots, W_n)$ . Note that by using ratio scales, the weights we estimate are only unique up to multiplication by a positive constant; i.e.,  $W$  is equivalent to  $CW$  where  $C > 0$ . Thus we typically will normalize  $W$  so that it sums to 1 or 100 for convenience.

If the judgments were perfectly consistent, i.e.,

$$a_{ik}a_{kj} = W_i W_k / W_k W_j = W_i / W_j = a_{ij} \text{ for all } i, j, k = 1, 2, \dots, n.$$

However, errors in judgment are typically made and, therefore, the final result using the column normalization would depend on which column was chosen. Two competing methods exist for estimating the weights when errors in judgment exist (Fichtner, 1986; Saaty & Vargas, 1984). Logarithmic least squares (LLS) and Saaty's (1977) eigenvector method. LLS estimate the weights  $W$  as those which minimize the following objective:

$$\sum_{i=1}^n \sum_{j=1}^n (1/a_{ij} - W_i/W_j)^2.$$

Saaty's method calculates  $W$  as the prime eigenvector of the matrix  $A$ :

$A_w = \lambda_{\max}$  where  $\lambda_{\max}$  is the highest eigenvalue of the matrix, or

$$W_i = \frac{\sum_{j=1}^n a_{ij} W_j}{\lambda_{\max}} \text{ for all } i = 1, 2, \dots, n.$$

The eigenvector method has the interpretation of being a simple averaging process by which the final weights  $w$  are taken to be the average of all possible ways of comparing the alternatives. Thus, the eigenvector is a “natural” method for computing the weights. Furthermore, some theoretical evidence suggests by Saaty (1986 & 1987) that this method is the best at uncovering the true rank-order of asset of alternatives.

The eigenvector method also yields a natural measure for inconsistency. As shown by Saaty (1977, 1980)  $\lambda_{\max}$  is always greater than or equal to  $n$  for positive, reciprocal matrices, and is equal to  $n$  if and only if  $A$  is a consistent matrix. Thus,  $\lambda_{\max} - n$  provides a useful measure for the degree of inconsistency. Normalising this measure by the size of the matrix, Saaty defines the consistency index (C. I.) as:

$$\text{Consistency Index (C. I.)} = \frac{\lambda_{\max} - n}{n - 1}$$

For each size of matrix  $n$ , random matrices were generated and their mean C.I. value, called the Random Index (R.I.), was computed; these values are shown in below table-4.1.

**Table 4.1: Random Inconsistency Index (R. I.)**

$n$	1	2	3	4	5	6	7	8	9	10
R. I.	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

Using these values, the consistency ratio (C.R.) is defined as the ration of the C.I. to the R.I.; thus, C.R. is a measure of how a given matrix compares to a purely random matrix in terms of their C.I.’s therefore,

$$\text{Consistency Ration (C.R.)} = \frac{\text{Consistency Index (C.I.)}}{\text{Random Inconsistency Index (R.I.)}}$$

A value of the C. R.  $\leq 0.1$  is typically considered acceptable; larger values require the decision maker to reduce the inconsistencies by revising judgments.

### 4.3.2 Exploratory Factor Analysis

Since its inception a century ago (Spearman, 1904, 1927), factor analysis has become one of the most widely used multivariate statistical procedures in applied research endeavors across a multitude of domains (e.g., psychology, education, sociology, management, healthcare etc). The fundamental intent of factor analysis is to determine the number and

nature of latent variables or factors that account for the variation and covariation among a set of observed measures, commonly referred to as indicators. Specifically, a factor is an unobservable variable that influences more than one observed measure and that accounts for the correlations among these observed measures. In other words, the observed measures are inter-correlated because they share a common cause (i.e., they are influenced by the same underlying construct); if the latent construct was partially out, the inter correlations among the observed measures would be zero to one. Thus, factor analysis attempts a more parsimonious understanding of the covariation among a set of indicators because the number of factors is less than the number of measured variables.

In social science and management research, factor analysis is most commonly used in psychometric evaluations of multiple-item testing instruments. It is a data reduction technique. In the early stages of scale development, researcher might use factor analysis to examine the plausibility of this assumption i.e., the ability of a single factor to account for the inter correlations among the different variables and to determine if all variables are reasonable indicators of the underlying construct of particular dimension or factor i.e., how strongly is each item related to the factor?.

In our research, factor analysis was used to find the risk factors influencing the perceived service quality and customer perceived value dimensions for private healthcare sector. The factor analysis is an interdependence technique and is used to find the underlying structure among the variable under consideration. The main objective of factor analysis is to reduce the number of items and to notice construction of the relationships between various items; i.e., to segmentation of variables. Hence, the factor analysis is applied as a item reduction or structure detection method (the term factor analysis was first introduced by Thurstone, 1931). Therefore factor analysis has been classified into two categories. Those are Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Both EFA and CFA aim to reproduce the observed relationships among a group of variables with a smaller set of latent variables, but they differ fundamentally by the number and nature of a priori specifications and restrictions made on the factor model. EFA is a data-driven approach such that no specifications are made in regard to the number of latent factors (initially) or to the pattern of relationships between the common factors and the indicators.

### **4.3.2.1 Terminologies of Factor Analysis**

#### **4.3.2.1.1 Factor Loadings**

It is the matrix representing the correlation between different combinations of variables and factors.  $L_i(j)$  is the factor loading of the variable  $j$  on the factor  $i$ , where  $i = 1, 2, 3, \dots, k$  and  $j = 1, 2, 3, \dots, k$

#### **4.3.2.1.2 Communality Coefficients**

In the factor analysis, the amount of variance in the indicator, explained by the common factors is often referred to as the communality. As such, a variable that has no specific variance (or random variance) would have a communality of 1; Thus, for the construct 1 indicator, the factor model estimates that some  $x$  value of its total variance is common variance (variance explained by the latent variable of dispersion), whereas the remaining value (i.e.,  $1 - x = k$ ) is unique variance. Variable that shares none of its variance with any other variable would have a communality of 0. If a measured variable had a communality coefficient close to 0%, this would mean that this variable is not being represented within the factors. It may explain that unique variance is some combination of specific factor and measurement error variance. It is important to note that EFA and CFA do not provide separate estimates of specific variance and error variance.

#### **4.3.2.1.3 Eigenvalue >1 Rule**

The Kaiser–Guttman rule (also referred to as “the Kaiser criterion,” or “the eigenvalues > 1.0 rule”) is very straight forward. Obtain the eigenvalue derived from the input correlation matrix, determine how many eigenvalues are greater than 1.0; and use that number to determine the number of nontrivial latent dimensions that exist in the input data; then, the Kaiser–Guttman rule would suggest a unidimensional latent structure. The logic of the Kaiser–Guttman rule is that when an eigenvalue is less than 1.0, the variance explained by a factor is less than the variance of a single indicator. Researcher should note that eigenvalues represent variance, and that EFA standardizes both the latent and observed variables (e.g., the variance that each standardized input variable contributes to the factor extraction is 1.0). Thus, because a goal of EFA is to reduce a set of input indicators (the number of latent factors should be smaller than the number of input indicators), if an eigenvalue is less than 1.0, then the corresponding factor accounts for less variance than the indicator (whose variance equals 1.0). The Kaiser–Guttman rule has wide appeal because of its simplicity and objectivity.

#### **4.3.2.1.4 Scree plot or test criterion**

Another popular approach, called the scree test (Cattell, 1966), also uses the eigenvalues that can be taken from either the input or reduced correlation matrix. The scree test employs a graph in which the eigenvalues form the vertical axis and the factors form the horizontal axis. The scree plot graph is inspected to determine the last substantial decline in the magnitude of the eigenvalues or the point where lines drawn through the plotted eigenvalues change slope. The limitation of this screen plot or test criterion is that the results may be ambiguous i.e., no clear shift in the slope and open to subjective interpretation. However, noted by Gorsuch (1983), the scree test performs reasonably well under conditions when the sample size is large and well defined factors are present in the data i.e., factors defined by multiple items with high communalities. This approach is purely visual, not invoking statistical significance.

#### **4.3.2.1.5 Factor Rotation**

Once the appropriate number of factors has been determined, the extracted factors are rotated, to foster their interpretability. In instances when two or more factors are involved (rotation does not apply to one-factor solutions), rotation is feasible because of the undefined nature of the common factor model i.e., for any given multiple-factor model, there exist an infinite number of equally good-fitting solutions, each represented by a different factor loading matrix. In the factor loading each factor is defined by a subset of indicators that load highly on the factor and each indicator has a high loading on one factor (often referred to as a primary loading) and has a trivial or close to zero loading on the remaining factors (referred to as a cross loading or secondary loading). In social science and management research, factor loadings greater than or equal to 0.3 or 0.4 are often interpreted; i.e., the item or variable is meaningfully related to a primary or secondary factor. There is no widely accepted guidelines exist. It is important to emphasize that factor rotation does not alter the fit of statistical solution. Factor rotation is a mathematical transformation (i.e., rotation in multidimensional space) that is undertaken to foster interpretability by maximizing factor loadings close to 1.0 and minimizing factor loadings close to 0.0. In multi factorial models, rotate the solution to obtain simple structure by using an oblique rotation method (e.g. promax, Quartimin).

#### **4.3.2.1.6 Possible Numbers of Factors**

In the factor analysis it is also important to note that the number of factors ( $m$ ) that can be extracted by exploratory factor analysis is limited by the number of observed measures ( $p$ )

that are submitted to the analysis. The maximum limit on the number of factors differs across estimation techniques. For instance, in EFA, the maximum number of factors can be extracted is  $p - 1$  and the number of parameters that are predictable in the factor solution ( $a$ ) must be equal to or less than the number of elements and in the covariance matrix (i.e.,  $a \leq b$ ). Maximum number of factors is mathematically showed as

$$a = (p \times m) + [(m \times (m + 1)) / 2] + p - m^2$$

Where  $p$  = number of observed variables (indicators), and  $m$  = number of factors.

#### 4.3.2.1.7 Factor Scores

After an appropriate factor solution has been established, the researcher may wish to calculate factor scores using the factor loadings and factor correlations. Factor scores are used for various purposes such as to serve as proxies for latent variables, and to determine a participant's relative standing on the latent dimension. Conceptually, a factor score is the score that would have been observed for a person if it had been possible to measure the latent factor directly. The most frequently used process of getting factor scores ( $F_N \times V$ ) is called regression method. Calculated variables are each transformed into z scores with means of zero and Standard Deviations of 1.0. Then the following algorithm is applied:

$$F_{N \times F} = Z_{N \times V} R_{V \times V}^{-1} P_{V \times F}$$

The right most portion of the formula can be re-represented as:

$$W_{V \times F} = R_{V \times V}^{-1} P_{V \times F}$$

#### 4.3.2.2 Fundamental steps and procedural recommendations for EFA:

##### 4.3.2.2.1 Factors extraction

Use an estimator based on the common factor model such as *Principal factors* as no distributional assumptions, less prone to improper solutions than maximum likelihood and *Maximum likelihood* as assume multivariate normality, but provides goodness of fit evaluation and in some cases, significance tests and confidence intervals of parameter estimates.

##### 4.3.2.2.2 Factor selection

Determine the appropriate number of factors by Screen plot of eigenvalues from the reduced correlation matrix, Parallel analysis and/or Goodness of model fit ( $\chi^2$ , Root Mean Square Error Approximation (RMSEA)).

#### **4.3.2.2.3 Interpret the factors and evaluate the quality of the solution**

Consider the meaningfulness and interpretability of the factors; factors should have substantive meaning and conceptual/empirical relevance comprised of reverse and non-reverse-worded items. Eliminate poorly defined factors such as: factors on which only one or two items have salient loadings (low communalities); factors with low factor determinacy (poor correspondence between the factors and their factor scores). Eliminate poorly behaving items such as; items with high loadings on more than one factor (cross loadings); items with small loadings on all factors (low communalities).

#### **4.3.2.2.4 Re-run and replicate the factor analysis**

If items or factors are dropped in preceding step, re-run the exploratory factor analysis with the same sample; replicate the final exploratory factor analysis solution in an independent sample. Consider further replications/extensions of the factor solution by developing tentative confirmatory Factor Analysis (CFA) models.

### **4.3.3 Confirmatory Factor Analysis (CFA)**

The objective of CFA is to identify latent factors that account for the variation and covariation among a set of indicators. EFA and CFA both models are based on the common factor model and thus many of the concepts and terms that were discussed in EFA like factor loadings, unique variances, communalities and residuals. In CFA the researcher must prespecify all aspects of the factor model: the number of factors, the pattern of indicator, factor loadings and so forth. CFA requires a strong empirical or conceptual foundation to guide the specification and evaluation of the factor model. Accordingly, CFA is typically used in later phases of scale development or construct validation after the underlying structure has been tentatively established by prior empirical analyses using EFA, as well as on theoretical grounds. EFA and CFA often rely on the same estimation methods like maximum likelihood approach. CFA is strongly driven by theory or prior research evidence. Thus, whereas in EFA the researcher can only prespecify the number of factors, the CFA researcher usually tests a much more parsimonious solution by indicating the number of factors, the pattern of factor loadings and an appropriate error theory. Thus every aspect of the CFA model is specified in advance. The acceptability of the specified model is evaluated by goodness of fit, the interpretability and strength of the resulting parameter estimates. CFA is more appropriate than EFA in the later stages of construct validation and test construction, when prior

evidence and theory support more risky a priori predictions regarding latent structure. In addition to this CFA offers a very strong analytic framework for evaluating the equivalence of measurement models across distinct groups such as demographic groups like sex, race, culture or economic conditions of the respondents. CFA is a very important component within a broader class of methods called Structural Equation Modeling (SEM) or covariance structure analysis. Generally, CFA is used as a precursor to SEM, which specifies structural relationships among the latent variables.

Most of the numerical methods require at least one statistical test to establish the significance of an analysis. However, in CFA, many statistical tests are used to determine, how well the model fits to the data (Suhr, 2006). While reporting the results of a confirmatory factor analysis; Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) are narrated. These model fit indices are described as follows:

#### **4.3.3.1 Goodness of Fit Index:**

The goal of goodness-of-fit approach is to identify the solution that reproduces the observed correlations considerably better than parsimonious models (i.e., models involving fewer factors). The GFI is able to reproduce these observed relationships equally or nearly as well as more complex solutions (i.e., models with more factors). Its measure indicates how well a specified model reproduces the covariance matrix among the indicator variables. The GFI was an early attempt to produce a fit statistic that was less sensitive to sample size. This statistic is still indirectly sensitive to sample size due to the effect of N on sampling distributions (Maiti & Mukherjee, 1991). The possible range of GFI values is zero to one with superior values indicating better fit, the GFI value of greater than .95 considered good.

#### **4.3.3.2 Adjusted Goodness of Fit Index (AGFI)**

The AGFI tries to take into account different degrees of model complexity. It does so by adjusting GFI by a ratio of the degrees of freedom used in a model to the total degrees of freedom available. The AGFI penalizes more complex models and favors those with a minimum number of free paths. AGFI values are typically lower than GFI values in proportion to model complexity.



#### **4.3.3.3 Normed Fit Index (NFI)**

The NFI is one of the original incremental fit indices. It is a ratio of the difference in the  $\lambda^2$  value for the fitted model and a null model divided by the  $\lambda^2$  value for the null model. It ranges between zero and one and a model with perfect fit would produce an NFI of 1. The CFI was derived from this index in an effort to include model complexity in a fit measure.

#### **4.3.3.4 Comparative Fit Index (CFI)**

Comparative fit indices is also referred to as incremental fit indices (Bentler, 1990; Hu & Bentler, 1998) which evaluate the fit of a user-specified solution in relation to a more restricted, nested baseline model. Typically, this baseline model is null or independence model in which the covariances among all input indicators are fixed to zero, although no such constraints are placed on the indicator variances. As you might expect, given the relatively liberal criterion of evaluating model fit against a solution positing no relationships among the variables, comparative fit indices often look more favorable i.e., more suggestive of acceptable model fit than indices from the preceding categories. The value of CFI ranges from zero to one with values closer to one implying good model fit.

#### **4.3.3.5 Root Mean Square Error of Approximation (RMSEA)**

A widely used and recommended index from this category is the Root Mean Square Error of Approximation (RMSEA) (Steiger & Lind, 1980). The RMSEA is a population base index that relies on the non-central  $\chi^2$  distribution, which is the distribution of the fitting function when the fit of the model is not perfect. The non-central  $\chi^2$  distribution includes a non-centrality parameter (NCP), which expresses the degree of model mis-specification. The NCP is estimated as  $\chi^2 - df$  (if the result is a negative number,  $NCP = 0$ ). When the fit of the model is not perfect, the NCP is greater than zero and shifts the expected value of the distribution to the right of that of the corresponding central  $\chi^2$ . The RMSEA is an error of approximation index because it assesses the extent to which a model fits reasonably well in the population (as opposed to testing whether the model holds exactly in the population of  $\chi^2$ ). In the RMSEA it is rare to see exceeding value greater than one. As with the SRMR, RMSEA values of zero indicates perfect fit and values close to zero suggest good model fit.

#### **4.3.4 Structural Equation Modeling**

Structural equation modeling is a statistical methodology used by many different sector researchers like economists, educational researchers, marketing researchers, medical researchers, healthcare professional and a variety of social and behavioural scientists.

Structural equation modeling (SEM) uses various types of models to depict relationships among observed variables, with the same basic goal of providing a quantitative test of a theoretical model hypothesized by the researcher. More specifically, various theoretical models can be tested in SEM that hypothesize how sets of variables define constructs and how these constructs are related to each other. One reason for its pervasive use in many scientific and social research fields of study is that structural equation modeling provides researchers with a comprehensive method for the quantification and “testing of theories”. Other major characteristics of structural equation models are that they explicitly take into account the measurement error that is ubiquitous in most disciplines and contain latent variables.

SEM models essentially combine path models and confirmatory factor models; i.e., SEM models incorporate both latent and observed variables. In the management and behavioural sciences, researchers are often interested in studying theoretical constructs that cannot be observed directly. These abstract phenomena are termed as latent variables or factors. Because latent variables are not observed directly, it follows that they cannot be measured directly. Thus, the researcher must operationally define the latent variable of interest in terms of behaviour believed to represent it. As such, the unobserved variable is linked to one that is observable, thereby making its measurement possible. Assessment of quality, then, constitutes the direct measurement of an observed variable, albeit the indirect measurement of an unobserved variable (i.e., the underlying dimension). It is important to note that the term quality used here in the broad sense to include scores on a particular measuring instrument.

Due to the mathematical complexities of estimating and testing the proposed assertions, computer programs are a must in applications of structural equation modelling methodology. The hypothesized model can then be tested statistically in a simultaneous analysis of the entire system of variables to determine the extent to which it is consistent with the data. If goodness-of-fit is adequate, the model argues for the plausibility of postulated relations among variables; if it is inadequate, the tenability of such relations is rejected. It takes a confirmatory rather than an exploratory approach to the data analysis (although aspects of the latter can be addressed). Furthermore, by demanding that the pattern of inter variable relations be specified a priori, SEM lends itself well to the analysis of data for inferential purposes. By contrast, most other multivariate procedures are essentially descriptive by nature (e.g., exploratory factor analysis), so that hypothesis

testing is difficult, if not impossible. Secondly, whereas traditional multivariate procedures are incapable of either assessing or correcting for measurement error, SEM provides explicit estimates of these error variance parameters. The model-fitting process can therefore be summarized as follows:

$$\text{Data} = \text{Model} + \text{Residual}$$

where data represent score measurements related to the observed variables as derived from persons comprising the sample. Model represents the hypothesized structure linking the observed variables to the latent variables and, in some models, linking particular latent variables to one another. Residual represents the discrepancy between the hypothesized model and the observed data. SEM follows a logical sequence of five steps or processes: model specification, model identification, model estimation, model testing, and model modification. These basic building blocks are essential in conducting SEM models.

#### **4.3.4.1 Model Specification**

Model specification involves using all of the available relevant theory, research, and information to develop a theoretical model. Thus, prior to any data collection or analysis, the researcher specifies a particular model that should be confirmed using variance-covariance data. In other words, available information is used to decide which variables to include in the theoretical model (which implicitly also involves which variables not to include in the model) and how these variables are related. Model specification involves determining every relationship and parameter in the model that is of interest to the researcher. Cooley (1978) indicated that this was the hardest part of structural equation modeling.

A given model is properly specified when the true population model is deemed consistent with the implied theoretical model being tested, i.e., the sample covariance matrix  $S$  is sufficiently reproduced by the implied theoretical model. The goal of the applied researcher is, therefore, to determine the best possible model that generates the sample covariance matrix. Ultimately, an applied researcher wants to know the extent to which the true model that has generates the data, deviates from the implied theoretical model. If the true model is not consistent with the implied theoretical model, then the implied theoretical model is misspecified. The difference between the true model and the implied model may be due to errors of omission and/or inclusion of any variable or parameter. The exclusion or inclusion of unimportant variables will produce implied models that are misspecified. The problem is that a misspecified model may result in

biased parameter estimates, in other words, estimates that are systematically different from what they really are in the true model. This bias is known as specification error. In the presence of specification error, it is likely that one's theoretical model may not fit the data and be deemed statistically unacceptable.

#### **4.3.4.2 Model Identification**

In structural equation modeling, it is necessary estimation of intercepts associated with the observed variables, in addition to those associated with the unobserved latent constructs, it is evident that the attainment of an over identified model is possible only with the imposition of several specification constraints. Indeed, in SEM it is complicated issue, and ultimately renders impossible, the estimation of latent means in single-group analyses. On the other hand multi-group analyses provide the mechanism for imposing severe restrictions on the model such that the estimation of latent means is possible. More specifically, because more than two groups under study are tested simultaneously, evaluation of the identification criterion is considered across groups. As a consequence, although the structured means model may not be identified in one group, it can become so when analyzed within the framework of a multi-group model. This outcome occurs as a function of specified equality constraints across groups. More specifically, these equality constraints derive from the underlying assumption that both the observed variable intercepts and the factor loadings are invariant across groups. It is difficult that the researcher resolve the model identification issues prior to the estimation of dimensions. In the identification issue, On the basis of the data sample contained in the sample covariance matrix and the hypothetical model implied by the populace covariance matrix  $\Sigma$ , can a unique set of construct estimates be noteworthy or not. Because there are an unlimited number of feasible solutions for this issue, i.e., there is indeterminacy or the likelihood that the sample fits more than one implied imaginary model uniformly well. Traditionally, model identifications are classified into three categories. These classification are firstly is a model unidentified or identified if any structure may not be exclusively determined because unavailability of sufficient information in the matrix. Secondly the structured model is identified if all the dimensions are distinctively determined because sufficient information available in the matrix. Lastly, the model is more notorious when there is more estimated parameters because there is more than an adequate amount of information in the matrix. If model is in the category of second or final, then the model is well-known. If a model is first stage, the researcher should not trust on the estimated dimension, i.e., the degrees of freedom for the model is negative.

#### **4.3.4.3 Model Estimation**

The structured model estimation or prediction process contains the use of appropriate fitting function to minimize the difference between  $\Sigma$  and model matrix. Several estimation procedures are available in the statistical procedure. Some of the prior estimation techniques such as Un-weighted or Ordinary Least Squares (ULS or OLS), Generalized Least Squares (GLS) and Maximum Likelihood (ML). In addition to that recent simulation research conducted by Lei and Lomax (2005) found that the “ML and GLS estimators are quite comparable in the case of small to moderate non-normality for interval data”. The ULS or OLS estimates are consistent, have no distributional assumptions or associated statistical tests, and are scale dependent, i.e., changes in observed variable scale yield different solutions or sets of estimates.

#### **4.3.4.4 Model Testing**

An important result of any path analysis is the fit of the specified model. If the path model fits well, then the specified model has been supported by the sample data. If the model fit of the estimated path model is not so good, then the specified model has not been supported by the sample data, and the researcher typically attempts to modify the path model to achieve a better fit. Statistical analysis provides modification indices and expected parameter changes values to guide modifying a model to obtain better model-fit criteria. There are different methods to test the model fit indices. Researcher can consider some universal edition test of the fit of the structured model. After that researchers should examine the every parameter in the structured model. Researcher should consider the universal tests in SEM known as model-fit criteria such as F-test in ANOVA. In SEM, there is large number of model-fit indices. The measurement model in SEM is assessed through CFA, as it permits to load on multiple dimension and latent constructs. In social science and management research investigator frequently uses the chi-square ( $\chi^2$ ) statistics, Root-Mean-Square Error of Approximation (RMSEA) values, tabled t-value for validation of significant out comes and substantive meaning of hypothetical model. SEM model-fit indices have no single statistical test of significance that identifies a correct model, given the sample data, especially since equivalent models or alternative models can exist that yield exactly the same data to model fit.

**Table 4.2: Model-Fit Criteria and Acceptable Fit Interpretation**

Model-Fit Criterion	Acceptable Level	Interpretation
Chi-square	Tabled $\chi^2$ Value	Compares obtained $\chi^2$ value with tabled value for given <i>df</i>
Goodness-of-fit index (GFI)	0= not fit 1=perfect fit	Value close to .90 or .95 reflect a good fit
Adjusted Goodness of Fit Index (AGFI)	0= not fit 1=perfect fit	Value adjusted for <i>df</i> , with .90 or .95 a good model fit
Root-Mean square Residual (RMR)	Researcher defines level	Indicates the closeness of $\Sigma$ to S matrices
Standardized Root-Mean square Residual (SRMR)	< 0.05	Value less than .05 indicates a good model fit
Root-mean-square error of approximation (RMSEA)	.05 to .08	Value of .05 to .08 indicate close fit
Tucker–Lewis Index (TLI)	0= not fit 1=perfect fit	Value close to .90 or .95 reflects a good model fit
Normed fit index (NFI)	0= not fit 1=perfect fit	Value close to .90 or .95 reflects a good model fit
Parsimony fit index (PNFI)	0= not fit 1=perfect fit	Compares values in alternative models

**Table 4.3: Formulas for model fit indices**

Goodness-of-Fit Index (GFI)	$1 - [\chi^2_{\text{model}}/\chi^2_{\text{null}}]$
Normed Fit Index (NFI)	$(\chi^2_{\text{null}} - \chi^2_{\text{model}}) / \chi^2_{\text{null}}$
Relative Fit Index (RFI)	$1 - [(\chi^2_{\text{model}}/\text{df}_{\text{model}}) / (\chi^2_{\text{null}}/\text{df}_{\text{null}})]$
Incremental Fit Index (IFI)	$(\chi^2_{\text{null}} - \chi^2_{\text{model}}) / (\chi^2_{\text{null}} - \text{df}_{\text{model}})$
Tucker-Lewis Index (TLI)	$[(\chi^2_{\text{null}}/\text{df}_{\text{null}}) - (\chi^2_{\text{model}}/\text{df}_{\text{model}})] / [(\chi^2_{\text{null}}/\text{df}_{\text{null}}) - 1]$
Comparative Fit Index (CFI)	$1 - [(\chi^2_{\text{model}} - \text{df}_{\text{model}}) / (\chi^2_{\text{null}} - \text{df}_{\text{null}})]$
Model Akaike Information Criterion	$\chi^2_{\text{model}} + 2q(\text{number of free parameters})$
Null Akaike Information Criterion	$\chi^2_{\text{null}} + 2q(\text{number of free parameters})$
Root Mean Square Error Approximation	$\sqrt{[(\chi^2_{\text{model}} - \text{df}_{\text{model}}) / ((N - 1)\text{df}_{\text{model}})]}$

#### **4.3.4.5 Model Modification**

The final step in structural equation modeling is model modification. In other words, if the fit of the model is less than satisfactory, then the researcher typically performs a specification search to seek a better fitting model. If the fit of the implied hypothetical model is not as strong as one would like, then the next step is to modify the model and subsequently evaluate the new modified model. In order to find out how to modify the structured model, there are different procedures available for the researcher to detection of specific errors. One may eliminate parameters that are not significantly different from zero and/or include additional parameters to arrive at a modified model. For the elimination of dimensions, the most frequently used method in SEM is to distinguish the t-statistic for each parameter to a tabled t-value  $> 1.96$  to conclude statistical significance. For the inclusion of additional parameters, the most commonly used techniques in SEM are the modification index and the expected parameter change statistic. Model modification reinforces confidence in the implications, and provides strong implications for conceptual development and realistic application. The data analysis was done using SPSS AMOS-21.

#### **4.3.5 RIDIT Analysis**

RIDIT analysis was first proposed by I. Bross in the year of 1958 and has been applied to the study of automobile accidents, cancer, schizophrenia various business management and behaviour studies. The term “RIDIT” elaborated as “Relative to an Identified Distribution” and is a probability transformations base on some empirical distributions that is taken as a reference class. RIDIT analysis is a “distribution free” in the sense that it makes no assumption about the distribution of the population under study (Fleiss et al. 2003). RIDIT is a weight assigned to a response category that reflects the probability of that category appearing in the reference distributions. RIDIT is a statistical technique deliberate to assist in the analysis of sample involving various items that are more than dichotomous classifications and are disciplined, but that do not attain the principles of advanced measurement systems such as those meet the criteria for equality-interval or ratio scales (Panda & Sreekumar, 2012). It is particularly useful form of mathematical analysis for items related ratings on a three or more point scale, indices made up of a number of variables and ratings based on global ratings (Beder & Heim, 1990). The RIDIT is a number assigned to a particular category of the variable that is equal to the proportion of in the reference class who have a lower score on that variable, plus one-half of the proportion of individuals in the category itself. Then RIDIT is a weight assigned to a

response category that reflects the probability of that category appearing in the reference distributions. RIDIT has a range that approaches the limits of zero and one at two sides. Once the RIDIT values for each category of the dependent variable have been computed, then the individual scores of RIDIT values transformed into dependent variable. Then we compute an average RIDIT value for a class rather than the proportion of respondents giving each of the responses in the dependent variable. There are  $m$  items and  $n$  ordered categories listed from the most favoured to the least favoured in the scale.

**4.3.5.1 Computation of RIDITs for the mention data set**

- i. Choosing the populace to serve as a mention data set. For a Likert scale analysis, the mention data set can be all samples of the study, if the respondents cannot be easily acknowledged.
- ii. Calculating occurrence  $f_j$  for each group/category of samples, where  $j=1, \dots, n$ .
- iii. Finding out mid-point accumulated occurrence  $F_j$  for each category of samples.

$$F_1 = \frac{1}{2} f_1 \dots \dots \dots (1)$$

$$F_j = \frac{1}{2} f_j + \sum_{k=1}^{j-1} f_k \text{ where } j = 2, \dots, \dots, n$$

- iv. Calculating RIDIT value  $R_j$  for each group/category of responses in the mention data set is as follows:  $R_j = F_j / N$  where  $J = 1, \dots, \dots, n$

$N$  is whole amount of responses from the scale analysis of concern. According to Bross (1958), the usual value of  $R$  for the concern data set is always 0.5.

**4.3.5.2 Calculate RIDITs and mean RIDITs for relationship data sets**

Comparison data set is included of the frequencies of samples for each class of a Likert scale item. There are  $m$  items in this work, there will be  $m$  number of related sample sets.

- i. Calculating RIDIT value  $r_{ij}$  for each class of scale items

$$r_{ij} = \frac{R_j \times \pi_{ij}}{\pi_i} \text{ where } i = 1, \dots, m$$

$\pi_{ij}$  is the occurrence of category  $j$  for the  $i$ th scale item, and  $\pi_i$  is a short form for the summation of frequencies for scale item  $i$  across all categories, i.e.  $\pi_i = \sum_{k=1}^n \pi_{ik}$

- ii. Calculating mean RIDIT  $\rho_i$  for each response item scale  $\rho_i = \sum_{k=1}^n r_{ik}$
- iii. Calculating confidence interval for  $\rho_i$ . When the volume of the collected data set is huge relative to that of any association sample set, the 95% confidence interval of any  $\rho_i$  is  $\rho_i \pm \frac{1}{\sqrt{3n\rho_i}}$

- iv. Testing the hypothesis using Kruskal-Wallis statistics i.e.,  $W. H_0 : \forall_i, \rho_i = 0.5$



$$H_a : \exists i, \rho_i \neq 0.5; \quad W = 12 \sum_{i=1}^m \pi_i (\rho_i - 0.5)^2$$

W follows a  $\chi^2$  distribution with (m-1) degree of freedom. If  $H_0$  cannot be accepted, then examine the relationships among confidence intervals of  $\rho$ .

#### 4.3.6 Grey Relation Analysis

Deng (1982) developed the grey system theory to deal with uncertainty in system. Grey relational analysis is an effectual means of analysing the relationship between two series. GRA is a quantitative analysis to explore the similarity and difference of development trends among elements used to measure the relation among elements, it can be used to capture the correlations between the reference factors and other compared factors of a system (Deng, 1989). In this study, the GRA is applied to construction an evaluation method for predict healthcare service quality indicators in Indian private healthcare sector. GRA has been successfully applied to various decision problems and the algorithm includes two steps (Lin & Juan, 2007; Lin et al., 2007; Lin & Hsu, 2003; Lin et al., 2005; Deng, 1989). The GRA can be used to capture the correlations among factors and candidates of a system. One of the advantages of GRA is that the quantitative and qualitative relationships can be identified from numerous factors with insufficient information. The GRA relational analysis introduced in the following is a method in grey system theory for analysing discrete data series. A procedure for the grey relational analysis, that is appropriate for Likert scale data consists of the following steps.

##### 4.3.6.1 Process of Grey Relational Analysis

- a. Generating reference data series  $x_0$ .

$$X_0 = (b_{01}, b_{02}, \dots, b_{0n}) \quad \dots \quad (1)$$

where n is the number of respondents. In general, the  $x_0$  reference data series consists of n values representing the most favoured responses.

- b. General comparison data series  $x_i$ .

$$X_i = (b_{i1}, b_{i2}, \dots, b_{in}) \quad \dots \quad (2)$$

where  $i = 1, \dots, k$ . k is the number of scale items. So there will be k comparison data series and each comparison data series contains n values.

- c. Computing the difference data series  $\Delta_i$ .

$$\Delta_i = (|b_{01} - b_{i1}|, |b_{02} - b_{i2}|, \dots, |b_{0n} - b_{in}|) \dots \quad (3)$$

- d. Finding the global maximum value  $\Delta_{\max}$  and minimum value  $\Delta_{\min}$  in data series.

$$\begin{aligned} \Delta_{\max} &= \max (\max \Delta_i) \\ \Delta_{\min} &= \max (\max \Delta_i) \quad \dots \quad (4) \end{aligned}$$

e. Transforming each data point in each difference data series to grey relational coefficient. Let  $\Upsilon_i(j)$  represents the grey relational coefficient of the  $j^{\text{th}}$  data point in the  $i^{\text{th}}$  difference data series, then

$$\Upsilon_i(j) = \frac{\Delta_{\min} + \rho \Delta_{\max}}{\Delta_i(j) + \rho \Delta_{\max}} \dots\dots\dots (5)$$

where  $\Delta_i(j)$  is the  $j^{\text{th}}$  value in  $\Delta I$  difference data series,  $\rho$  is a value between 0 and 1. The coefficient  $\rho$  is used to compensate the effect of  $\Delta_{\max}$  be an extreme value in the data series. In general the value of  $\rho$  can be set to 0.5.

f. Computing grey relational grade for each difference data series. Let  $\Gamma_i$  represent the grey relational grade for the  $i^{\text{th}}$  scale item and assume that data points in the series are of the same weights <sup>1</sup>,

$$\Gamma_i = \frac{1}{m} \sum_{n=1}^m \Upsilon_i(n) \dots\dots\dots (6)$$

The magnitude of  $\Gamma_i$ , reflects the overall degree of standardized deviance of the  $i^{\text{th}}$  original data series from the reference data series. In general, a scale item with a high value of  $\Gamma$  indicates that the respondents, as a whole, have a high degree of favoured consensus on the particular dimension.

Sorting  $\Gamma$  values into descending or ascending order to facilitate the managerial interpretation of the results

#### 4.4 Ethical Considerations

This particular research is based on survey of customer perception of service quality in private healthcare sector and was conducted according to the principles of the Declaration of Helsinki as revised in 2013. At the same time prior oral permission was taken from the respondents about their willingness to participate in the survey.

#### 4.5 Conclusion

This chapter outlines the different research methodologies such as AHP analysis, EFA and CFA, SEM and RIDIT and Grey Relational Analysis. The methodologies have been executed for meaningful and systematic outcome of the research carried out in this study. Data was collected through primary and secondary sources. The customers who have taken treatment from selected private hospitals have been considered as valid sample for the research. The selection of data for this research work was based on simple random sampling method and an attempt was made for equal representation of respondents from different types of hospitals. The succeeding chapter would examine different techniques and the motivation for selection of research techniques in detail for data analysis.

## Chapter 5

# Precedence for Healthcare Setting: Customers' Perspective

### 5.1 Introduction

The objective of this chapter is to assess and compare different private healthcare settings based on perceived service quality in Indian context using Analytical Hierarchy Process (AHP). Indian Private healthcare sector is predominantly controlled by three categories of healthcare settings *viz.* Nursing Clinics, Non-Corporate Hospitals and Corporate Hospitals. It will be biased to mix the opinions of customers of all the three set up and draw conclusion as they differ significantly from each other interms of price, quality, professionals etc. So we decided to find out the preferred healthcare set up and then try to build up the further discussions and analysis on the research issue. Analytical Hierarchy Process (AHP) was used to rank order healthcare setting with respect to the service quality dimensions and relative standings of every service provider with respect to its competitors. We proposed a feasible appraising approach based on AHP to decide the sustainability priority of dimensions like Reliability, Physical Environment, Empathy, Efficiency, Timeliness, Transparency, Affordability, Communication and Consistency in Indian private healthcare industry. The result demonstrates that Indian Non-Corporate Hospitals are performing better based on customers' perceived service quality followed by Corporate Hospitals and then Nursing Clinics. The comparative performance of healthcare setting is an attempt to establish a performance ranking. Hence, it assesses dimensions of the service quality that needs urgent attention. The results may provide insight to healthcare managers as to how they can improve their service quality in order to match customer expectation and improve business performance.

### 5.2 Measurement constructs for Perceived Service Quality

Parasuraman et al (1985, 1988) defined service quality as “the difference between perceived service level and customer expectations”. The dimensions used in this study for evaluating healthcare service quality are determined as Reliability and Responsiveness, Physical Environment, Empathy, Efficiency, Timeliness, Transparency, Affordability, Communication, Appropriateness and Consistency. These dimensions are described as:

### **5.2.1 Reliability and responsiveness**

Reliability (Error free) is determined as the ability to execute the promised service dependably and accurately. It is the most important dimension of perceived service quality. For Reliability and responsiveness the ultimate standard is either ‘right service first time’ (correct service delivery to the customer), or ‘right service on time’ (doctor keeps to the patient’s scheduled appointment time).

### **5.2.2 Physical Environment**

Physical Environment includes neatness, physical facilities, infrastructure, hospital functions, medical apparatus, devices and instruments, medical staff appearance and patient room, etc. It also includes basic workplace design features, such as obstacles, physical layout, and distance from different departments in the hospital. The tangible facets of service facility such as equipment, machinery, signage, employee appearance, etc., or man-made physical environment popularly known as ‘service scapes’ (Sureshchandar et al., 2002).

### **5.2.3 Empathy**

It refers to the ability of the service provider to provide a caring and personalised attention to each customer. Empathy denotes-caring and understanding of the customer needs. Caring (Bowers & Kiefe 2002) establishes personalised customer service and attention to customers and focus on understanding needs of customers.

### **5.2.4 Efficiency**

Efficiency is the system’s optimal use of available resources to yield maximum benefits or results (JCAHO, 1997). It speaks about a system’s ability to function at lower costs without diminishing attainable and desirable results (Donabedian, 2003). Efficiency also refers to the “value for money” realised with available resources (reduce the waste and cost of treatment; better utilisation of healthcare equipment etc.) and desired outputs (sound health of the patients). In an efficient health care system, resources are meant to yield the best value for the money spent (Palmer & Torgerson 1999). There are two ways to improve efficiency such as reduce quality waste, and reduce administrative or production costs.

### **5.2.5 Timeliness**

Timeliness is a related concept that is used in several country frameworks and refers to the degree to which patients are able to obtain care promptly (IOM, 2001). It includes both

timely access to care means people can get care when needed (Aday & Anderson 1975) and coordination of care (once under care, the system facilitates moving people across providers and through the stages of care) (Shortell 1976). A hospital ability to provide timely treatment for illness/injury is a key element in a patient-centered healthcare system.

### **5.2.6 Transparency**

Transparency in healthcare services offers a better instrument for engaging service providers and communicating consumer choices. Consumers are underprivileged when it comes to the lack of transparency around the price of healthcare services. Many strategies aimed at private healthcare setting for improving quality and decreasing costs, transparency has become a central focus of both public and private efforts (Marshall et al. 2000). However, greater transparency in service quality and price information might improve the value of healthcare. Healthcare service providers are advised to make information available to patients and their families or accompanying persons that allows them to make informed decisions when selecting a physician, hospital, healthcare plan, clinical practice or choosing among alternatives. Transparency would improve the credibility of hospitals, but the service providers do not offer much in Indian hospitals.

### **5.2.7 Affordability**

Affordability can be defined as a measure of someone's or something's ability to purchase a goods or a services (David, 2003). If hospital services are premium, and the patient has no insurance coverage, then that patient may not afford to visit a hospital/doctor or pay for treatment which leads to inadequate access to healthcare. Cost of healthcare in recent years has become a highly debated and sensitive issue not only in developing economies, but also in developed economics. Even economically advanced countries are spinning under the pressure of escalating healthcare costs and lack of ideas to contain them at affordable levels.

### **5.2.8 Communication**

Communication contains all the personnel involved in delivering the service, i.e. physicians, clinical staff, and supporting staff, etc. It consists of all the interactions between service providers, managers and customers (Huang et al. 2014). Extensive research (Asnani, 2009) has shown that no matter how experienced a physician/supporting staff might be, if they are not able to facilitate good communication with the customer, patients may be helpless.

### **5.2.9 Consistency**

Consistency of care should have least variability in healthcare from time to time, doctor to doctor, staff to staff and customer to customer. High variability among doctors/hospitals is a major problem throughout the Indian private healthcare setting. The perception and expectation gap can reduce through providing effective and efficient healthcare services according to the clinical guidelines and standards, which meet the patients' needs and satisfies the provider (Artemis, 2006).

### **5.3 AHP Analysis**

Analytic Hierarchy Process (AHP), was invented (1970) by Thomas L. Saaty, who had designed a tool for decision makers, scientists and researchers, and it is one of widely used Multiple Criteria Decision-Making (MCDM) tool. However, hospital selection criteria in India depends on the trust between service provider and service receiver and past experience or positive word of mouth. In this research work, we have adopted nine service quality dimensions of healthcare, these dimensions will help to overcome the scope of hospital selection criteria. This piece of research may enable the customers for perfect decision making in the selection of better service provider. AHP aims to solve the problems that are very complex and require the consideration of too many influential factors. AHP is one of the most popular Multi Criteria Decision Making (MCDM) method. Many research works had been done about applying decision support systems to healthcare tasks, but some of them have been published about the complex problem of quality optimization in healthcare (De Felice, 2012).

In our study, AHP is used to support the evolution of decision making in quality optimization in healthcare system. AHP was applied in the service quality measurement process as an effective tool for identifying and prioritizing relevant criteria to develop a systematic service quality measurement process (Pecchia et al. 2011). AHP is designed to cope up with both the rationale and intuition to select the better from multiple alternatives assessed with respect to several criteria. In this alternative assessment process, the respondents carry out simple pairwise comparison judgments, which will be used to develop overall priorities for ranking the alternatives. AHP analysis allows inconsistency in the judgments and provides a means to improve consistency.

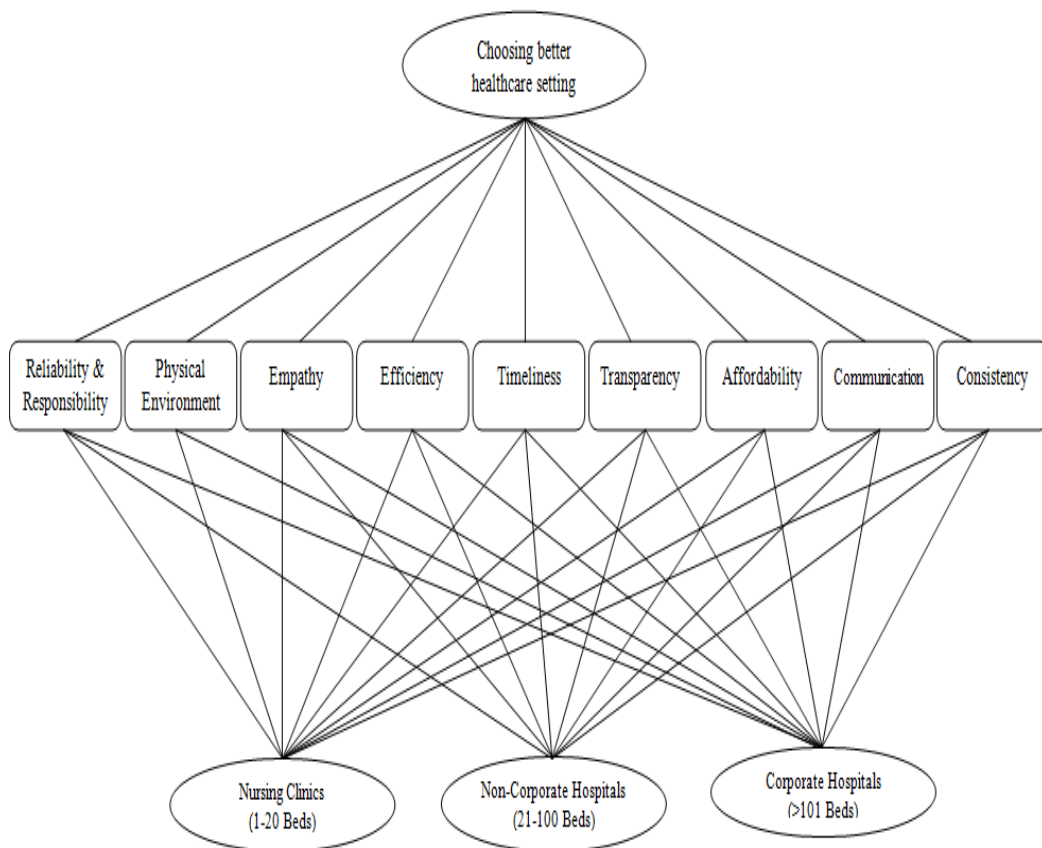
### 5.3.1 Scale Development for AHP

The aim of conducting opinion surveys through a structured questionnaire is to examine the hypothesized model developed to this work (Figure-5.1). The questionnaire was systematically prepared considering literature reviews and personal interviews with the respondents. In order to find reliability and validity of the AHP questionnaire consistency ratio and consistency was validated. Two separate questionnaires were developed for the study. The first set is for checking the precedence of customers towards healthcare setting through AHP that consists of a 9-point scale (Saaty, 1980) for CPSQ dimensions. The second set of questionnaire is to taking consideration into each CPSQ dimension with private healthcare setting i.e. nursing clinics, non-corporate hospital and corporate hospital. Demographic profile of the respondents participated and filled the questionnaire completely for AHP analysis was shown in table 5.1.

**Table: 5.1: Demographic characteristics of the respondents (n=370)**

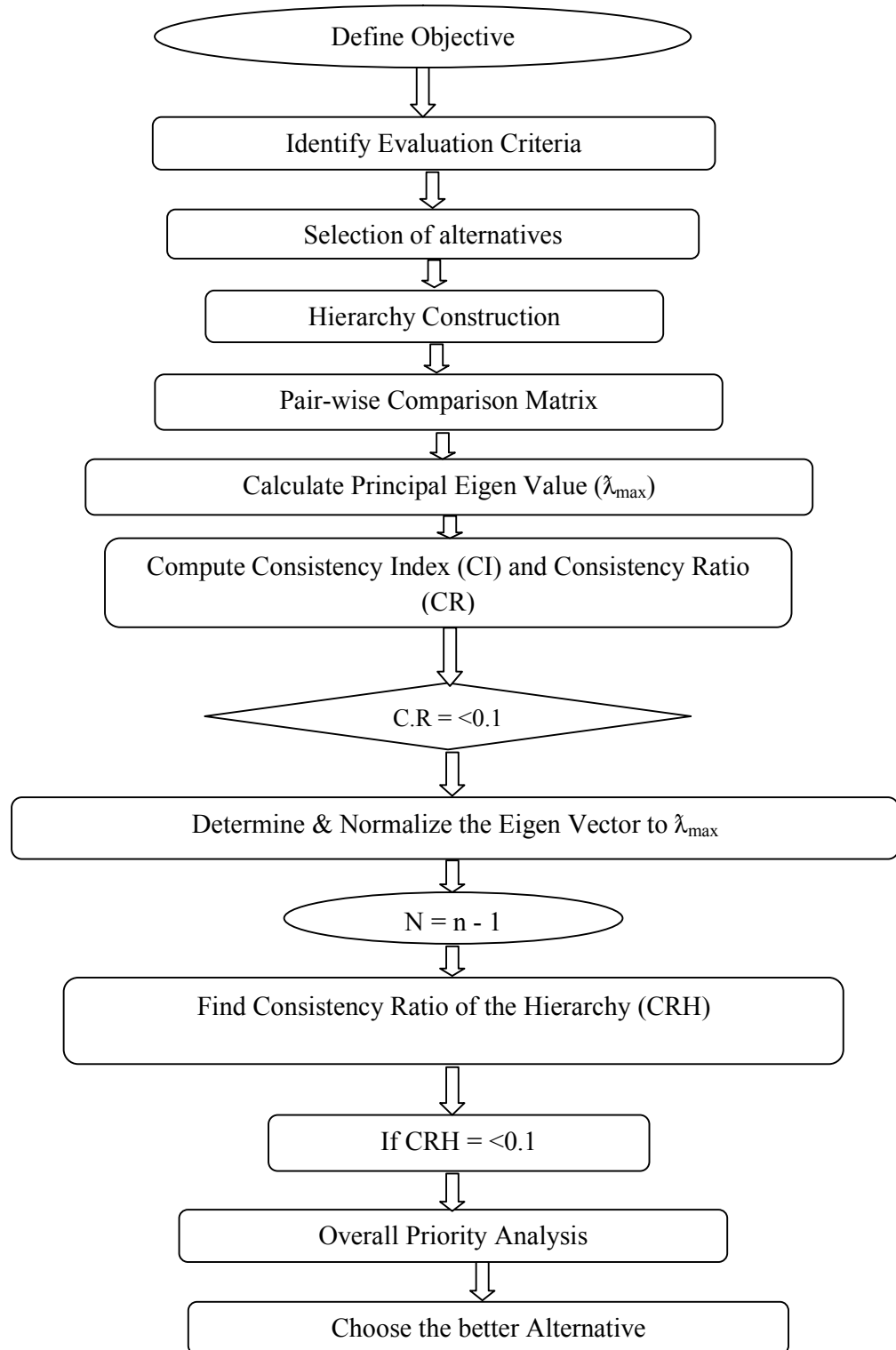
Demographic Characteristics	Variable	Frequency	%
Gender	Male	166	44.86
	Female	204	55.14
Age group	18 to 35 years	84	22.70
	36 to 50 years	126	34.05
	51 to 65 years	63	17.02
	>65 years	97	26.22
Treatment type	Inpatient	233	62.97
	Outpatient	137	37.03
Level of Education	Primary level	19	5.13
	Secondary level	103	27.84
	Graduates	137	37.03
	Above post graduation	111	30
Employment status:	Unemployed/House wife	44	11.89
	Government employee	118	31.89
	Private employee	126	34.05
	Self-employed	59	15.95
	Retired	23	6.21
Income group Per Annum	Low (< Rs.1,00,000)	151	40.81
	Middle (Rs. 100000 to 5,00,000)	179	48.38
	High (> Rs. 5,00,000 PA)	40	10.81
State wise distribution	Odisha	130	35.13
	Andhra Pradesh	115	31.08
	Telangana	125	33.78
Hospital wise classification	Nursing Clinics	124	33.51
	Non-corporate hospitals	123	33.24
	Corporate hospital	123	33.24

The response rate was found to be 68% with 370 valid responses. AHP questionnaire was divided into two sections. The first section contains the pair wise comparison items for customer evaluation of the importance of service quality dimensions in Indian private hospital setting. To minimize understanding bias, respondents were provided with descriptions of each service quality dimension. The judgments were based on a nine-point relational scale similar to AHP instrument (Saaty 1980). The scale used in this research paper briefly described in the table 5.2. The second section of the questionnaire contains the second level of the hierarchy, which has nine service quality dimensions i.e., reliability and responsiveness, physical environment, empathy, efficiency, timeliness, transparency, affordability, communication, appropriateness and consistency to evaluate perceived service quality in the private healthcare settings i.e., Nursing Clinics, Non-Corporate Hospitals and Corporate Hospitals. With each of these nine dimensions are taken as sub-sections which compared Nursing Clinics with Non-Corporate Hospitals, Nursing Clinics with Corporate Hospitals and Non-Corporate Hospitals with Corporate Hospitals.



**Figure: 5.1: Proposed Model for Choosing Better Healthcare Setting**





**Figure: 5.2: Process of AHP**

## 5.4 Statistical Analysis and Results

Each respondent's weight and scores are computed using Microsoft EXCEL. Applying the AHP analysis to hospital selection involved four steps referred as "AHP for better selection". The first step is to obtain customers' judgments in the pairwise comparison Matrices. Second step is consistency checking. Thirds step includes calculating weights of every response. Final step calculate the mean of overall weights for decision making. These steps was briefly describes as follows:

**Table 5.2: Pair-wise Comparison scale for AHP preferences**

Verbal Judgment	Numerical ratings
Equally important or Equally preferred	1
Moderately more important or Moderately preferred	3
Strongly more important or Strongly preferred	5
Very strongly more important or Very strongly preferred	7
Extremely more important or Extremely preferred	9
Intermediate values to reflect compromise	2,4,6,8

*Step-1: Get customer trade-off judgments for the customer perceived service quality dimensions showed in the paired Correlation Matrix:*

As portrayed over, a questionnaire was utilized to assemble the customers' Paired correlation responses for the two levels in the progression (as in Figure-5.1). The responses were utilized as inputs for the Paired Correlation Matrix—for the perceived service quality dimensions. The Paired Correlation Matrix for the "customer perceived service quality dimensions" shows properties at the top of the left corner (Table-A). In view of the judgments of the customers, the matrix shows numbers (in the nine-point scales) signifying the magnitude of the trait on the left with respect to the properties at the top. A higher esteem indicates that the characteristics on the left are more imperative than the traits at the top. For the "perceived service quality dimensions" of the order, the activities were contrasted with one another with focus relative fulfillment with every quality dimension regarding each of the dimensions. Three paired correlation matrices were developed at this level – one for each of the attributes. Be that as it may, because of the restrictions of space, stand out matrix is shown for "service quality dimensions with respect to quality provided by private hospitals" (as in Table 5.3). The cell values in the matrix meant as  $\alpha_{ij}$  and  $\beta_{ij}$  speak to the customers' judgments. The remaining cells of the Paired Correlation Matrix were set with the opposite of the customers' comparing attributes (signified as  $1/\alpha_{ij}$  and  $1/\beta_{ij}$ ).

**Table 5.3: Pair-wise comparison Matrix of Service quality dimensions with respect to quality provided by private hospitals**

Dimensions	Reliability & responsiveness	Physical Environment	Empathy	Efficiency	Timeliness	Transparency	Affordability	Communication	Consistency
Reliability Responsiveness	1	0.87784	0.73752	0.92005	0.95973	0.82944	0.83307	0.79444	0.62956
Physical Environment	1.65638	1	0.80240	0.78662	0.81197	0.70249	0.77311	0.84507	0.64437
Empathy	2.01988	1.79132	1	0.75396	0.83353	0.85816	0.75271	0.84057	0.77309
Efficiency	1.55767	1.80685	1.95862	1	0.95017	0.96072	0.84214	0.89458	0.79370
Timeliness	1.50283	1.76134	1.70984	1.46874	1	0.78395	0.78320	0.88444	0.84239
Transparency	1.72960	2.04600	1.62688	1.43042	1.79835	1	0.93470	0.97244	0.87473
Affordability	1.70734	1.81196	1.86866	1.63762	1.78391	1.45717	1	0.99999	0.87139
Communication	1.79957	1.64215	1.65236	1.53427	1.56101	1.39828	1.24841	1	0.74112
Consistency	2.09163	2.00055	1.65578	1.60247	1.51655	1.44852	1.44773	1.78749	1
	15.0646	14.7380	12.9520	11.1342	11.2156	9.43876	8.61505	9.01908	7.17034

Initial objective of the research was discussed with the customers after that overall structure of the decision hierarchy was agreed upon. At this point researchers assisted the customers in determining the hospital's service quality dimension needs in developing the relationships of the objectives and finalizing the decision hierarchy. The decision hierarchy was shown in figure-5.1. From this figure, we can see that the overall focus of the research was to choosing better healthcare setting in the private sector in India. The researchers acted as moderator for eliciting the judgements of the decision-making. The customers of the private healthcare setting responded to qualitative questions such as reliability & responsiveness and physical environment, which is more important, and by how much based on saaty nine point comparison scale, to choose better service provider in private healthcare setting. To illustrate the process, The raw data of preference matrix for a hypothetical set of nine dimensions of service quality is shown in table-5.3. The pairwise comparison matrix for the service quality dimensions are analyzed based on the judgment of the respondents. Research scale was shown in table-5.2. Later on to normalize pairwise matrix, each entry in each column was divided by the sum of the entries in that column. The normalized matrix is shown in table-5.4.

*Step-2: Consistency estimation and checking:* After the customers' judgments had been recorded, it was vital to check the consistency of each customer's trade off judgments.

This was measured by a Consistency Ratio (implied as CR), proportionate to the measure of Consistency Index (CI) upon Random Index (RI).

$$CR = CI / RI$$

CI is computed as  $(\lambda_{max} - N) / (N - 1)$  where "N" stays for number of measurements and  $\lambda_{max}$  demonstrates the greatest eigenvalue.

$$CI = (\lambda_{max} - N) / (N - 1)$$

Eigenvalues are the scalars associated with an immediate course of action of numerical values (or a network correlation).

$$\lambda_{max} = CJM1 * RPM1 + CJM2 * RPM2 + CJM3 * RPM3$$

where,  $\lambda_{max}$  = Highest Eigen Value

CJM1 = Column total of Judgemental Matrix of 1st Column

RPM1 = Row average of Priority Matrix of 1st Row

CJM2 = Column total of Judgemental Matrix of 2nd Column

RPM2 = Row average of Priority Matrix of 2nd Row

CJM3 = Column total of Judgemental Matrix of 3rd Column

RPM3 = Row average of Priority Matrix of 3rd Row

They are the square relations of judgments, and a consistency list was compared by Saaty (1980) to check for any clashing judgments. Likewise the Random Consistency Index (RI) has been organized in Table C. Prof. Saaty recommended that we utilize this table by differentiating it and the best possible one. The suitable Consistency record is called Random Consistency Index (RI). He haphazardly created equal grid utilizing 9 point scale and got the arbitrary consistency record to check whether it was around 0.10 or less. For every customer, the CR was registered for every Paired correlation network. A CR estimation of 0.10 was received as the suitable cutoff (Saaty, 1990). The responses with a CR score comparable to or lesser than 0.10 were recognized for examination.

*Step-3: Figure the weights of the service quality dimensions and relevance for the healthcare setting of every customer:*

In the wake of examination for the consistency of the customers' responses, the result of the customer's significance responses for every dimension measurement acquired in stage-1 was documented, and the third base of the product was figured to get the comparative weights. The columns in the Paired correlation framework were then included. The weights were standardized by calculating the total of the row and after that dividing individual row element upon the corresponding aggregate.

**Table 5.4: Normalized Matrix of paired Comparisons and Calculation of Priority Weights Composite priorities of the service quality dimensions in private hospitals**

	Reliability & responsiveness	Physical Environment	Empathy	Efficiency	Timeliness	Transparency	Affordability	Communication	Consistency	Priority Vector
Reliability & responsiveness	0.05373	0.04820	0.04881	0.06804	0.07236	0.07349	0.08520	0.07202	0.06954	0.06571
Physical Environment	0.09560	0.05692	0.05395	0.05688	0.05759	0.06071	0.07647	0.07719	0.08524	0.06895
Empathy	0.12129	0.11073	0.06650	0.05471	0.05746	0.08166	0.06737	0.07698	0.09644	0.08146
Efficiency	0.09209	0.10995	0.13864	0.07657	0.06838	0.08575	0.08683	0.07810	0.09467	0.09233
Timeliness	0.08325	0.10708	0.12024	0.11802	0.07542	0.06970	0.07368	0.08310	0.10237	0.09254
Transparency	0.10132	0.11527	0.10801	0.11024	0.15393	0.09055	0.09541	0.09456	0.10648	0.10842
Affordability	0.09628	0.10766	0.12445	0.13867	0.14017	0.14112	0.09713	0.11226	0.09967	0.11749
Communication	0.09523	0.09596	0.10658	0.12322	0.12532	0.13365	0.13472	0.09600	0.09562	0.11181
Consistency	0.13696	0.12396	0.10857	0.12940	0.12511	0.13910	0.15893	0.18553	0.12571	0.13703
	1	1	1	1	1	1	1	1	1	

*Step-4: Figure the mean global weights and prioritize the Environmental Activities over all clients:*

The outcomes obtained in stage-3 were then synthesized. The general global weight (GW) was obtained by multiplying the local weights (LW) of the service quality dimensions with the local weights of each healthcare setting. The mean global weight was utilized to rank the quality dimensions.

**Table 5.5: Composite Priority Weights**

Dimensions	AVG/LW	Type of Hospital	AVG/LW	Global Weight
Reliability & responsiveness	0.065717	NC	0.19606	0.012885
		NCH	0.429781	0.028244
		CH	0.374159	0.024589
Physical Environment	0.068957	NC	0.206998	0.014274
		NCH	0.396774	0.02736
		CH	0.396227	0.027323
Empathy	0.081469	NC	0.290458	0.023663
		NCH	0.415996	0.033891
		CH	0.293546	0.023915
Efficiency	0.092339	NC	0.239302	0.022097
		NCH	0.384527	0.035507
		CH	0.376171	0.034735
Timeliness	0.092541	NC	0.229517	0.02124
		NCH	0.365743	0.033846
		CH	0.40474	0.037455
Transparency	0.108427	NC	0.277495	0.030088
		NCH	0.398603	0.043219
		CH	0.323903	0.03512
Affordability	0.117498	NC	0.249948	0.029368
		NCH	0.382775	0.044975
		CH	0.367277	0.043154
Communication	0.111815	NC	0.28564	0.031939
		NCH	0.285616	0.031936
		CH	0.428744	0.04794
Consistency	0.137036	NC	0.245096	0.033587
		NCH	0.43229	0.059239
		CH	0.322614	0.04421

*Stage-5: Rank the Indian private healthcare setting by finding out the mean Global weights of private healthcare setting:*

All the customers global weights were then found the middle value of to acquire mean global weights for each Attribute in the row. The mean global weight was utilized to rank the perceived service quality Attributes. The three different private healthcare settings

were ranked depending upon the mean global weights and accordingly strategies can be formulated in the way of customer perspective. It concludes that pair-wise comparison to obtain attribute weights is reasonably consistent. In other contrast, if the CR values are larger than the standard value, the matrix results are inconsistent; those values should be exempted from further analysis.

**Table 5.6: Summarizes of priority weights of each alternative**

	Reliability & responsiveness	Physical Environment	Empathy	Efficiency	Timeliness	Transparency	Affordability	Communication	Consistency
NC	0.19606	0.20699	0.29045	0.23930	0.22951	0.27749	0.24994	0.28564	0.24509
NCH	0.42978	0.39677	0.41599	0.38452	0.36574	0.39860	0.38277	0.28561	0.43229
CH	0.37415	0.39622	0.29354	0.37617	0.40474	0.32390	0.36727	0.42874	0.32261

In our research Reliability and responsiveness-0.200519; Physical Environment-0.105316; Empathy-0.054608922; Efficiency-0.006699; Timeliness-0.011731; Transparency-0.009885, Affordability-0.042007; Communication-0.01877; and Consistency-0.000466 there are no such values in all factors of service quality, which is greater than random index, all values in our research is less than random Index Values those values are statistically significant. For this research we calculated three alternative decisions as:

$$N.C=0.19606*0.065717+0.206998*0.068957+0.290458*0.081469+0.239302*0.092339+0.229517*0.092541+0.277495*0.108427+0.249948*0.117498+0.28564*0.111815+0.2693*0.124202+0.245096+0.137036$$

$$NCH=0.429781*0.065717+0.396774*0.068957+0.415996*0.081469+0.384527*0.092339+0.365743*0.092541+0.398603*0.108427+0.382775*0.117498+0.395497*0.111815+0.395497*0.124202+0.43229*0.43229$$

$$CH=0.374159*0.065717+0.396227*0.068957+0.293546*0.081469+0.376171*0.092339+0.40474*0.092541+0.323903*0.108427+0.367277*0.117498+0.428744*0.117498+0.335203*0.124202+0.322614*0.137036$$

These alternatives are ranked in the Table-5.7.

**Table 5.7: Ranking of the Hospital Selection**

Hospital Type	Customer weighted Score	Ranking
Nursing Clinics (1-20 Beds)	0.252588	3
Non-Corporate Hospital (21-100 Beds)	0.38734	1
Corporate Hospital ( $\geq 101$ Beds)	0.360073	2

### **5.5 Conclusion and Managerial Implication**

Based on this chapter, it is observed that in general patients consider nine factors to be important while choosing their choice of private hospitals. This study exploits significant implications for the hospital administrators, healthcare providers, and marketers. In a fiercely competitive, complex and dynamic health care environment, it is extremely critical for them to discern what factors are important to a patient while making choice of hospital. A comprehensive understanding of how patients make their choice of hospitals can help the service providers to develop appropriate marketing strategies in order to attract more customers. It can also help the hospital administrators to find innovative ways to offer value added services at an affordable cost. Healthcare service providers are required to regularly monitor healthcare service quality and pledge endless quality improvement programmes accordingly in order to maintain premium level of customer satisfaction. Healthcare service quality can be improved by supportive leadership, accurate planning, effective administration of resources, employee education, research and training. Healthcare managers are advised to implement these service quality dimensions and decision making tools to get result based quality management metrics.

Customers are desperately searching for high quality healthcare service providers. If service providers have better understanding about the quality dimensions, then it will improve hospital service quality, enhance patient care, and expand processes in order to reduce the frequency and severity of service blunders. The healthcare organizations may focus to overcome the resource limitations by designing and implementing a justifiable healthcare system. Further, reduced costs, latest healthcare technologies, and increased efficiency in the private healthcare organizations may contribute towards a holistic system for better healthcare delivery.



## Chapter 6

# Managing Customer Perceived Service Quality Enablers

### 6.1 Introduction

The need to maintain and improve service standards is common to all industries, and is particularly vital in healthcare. Healthcare services that take part in the subject of health care constitute a part of marketing services and are a set of activities that interact with each other and come together by creating the customer experience (Akyüzl & Ayyildiz, 2012). Hospital services are comprised of a number of interacting elements that make up a health service episode or experience for the customers (Ashill, et al., 2005). Health services is important service area which is directly related to human life and offered with the aim of improving people's physical, mental and social aspects of health protection, and ensure continuity of this situation for the development of welfare and happiness of society. Compared with many other public services, it is understood that there is a need to focus on it as it is more sensitive and it should be produced with high-quality (Aslantekin et al., 2007). Like in all other service-based industries, frontline issues are the determinant of success in healthcare such as satisfaction, loyalty, and quality management.

Before generating a general score that will gauge the overall service quality and perceived value of the hospitals, the proposed framework was validated using IBM SPSS Amos 21. SEM was used to determine the relationships of each proposed service dimensions to the perceived service quality and customer perceived value, which was measured through the average satisfaction ratings obtained from the customers' survey. The proposed model was analyzed with each variable following the five point scale, similar to that used in the survey. With this, the collected data were transmitted to the same rating scale for consistency in running the model using AMOS. With the use of a structured model, SEM was able to simultaneously run several regression equations, which gave way to analyzing the unobservable variables in the proposed framework. Upon validating the framework, the significance of the relationships between variables was determined. The relevance of the service quality and customer perceived value dimensions proposed was established and measured through the observed variables in the generated structural equation model. Given that all variables have been translated to a five point

scale, the average score of the individual variable scores was used to obtain the significance.

## **6.2 Demographic Profile of the sample**

To determine the healthcare service quality dimensions and their relationships with satisfaction, loyalty and behavioral intention, a questionnaire survey was conducted. The questionnaire was finalized using focus group discussion with healthcare experts and users and a detailed discussion with hospital managers. The questionnaire had two parts: first, eight questions concerning the respondent's demographic profile; and second, 63 questions exploring respondents' CPSQ, CS, CL and BI towards service quality in private healthcare. In total, 780 respondents were randomly selected from Odisha (eastern India); Andhra Pradesh and Telangana (southern India) to collect data. Out of 780 questionnaires distributed in the private hospitals; 67.43 per cent responded resulting into 526 valid samples. The sampling unit was a patient or patient attendant in a private hospital. A five-point Likert scale was used: 5 = strongly agree, 3 = neutral and 1= strongly disagree. The demographic profile of the respondents was considered with gender, age, type of treatment, level of education, hospital visit, employment status, income group and state of domicile. A detail description of the respondents is shown in table 6.1. Out of the complete questionnaires filled in, 60.07% were males and 39.92% females. 15.96% of the respondents were in the age group of 18-35, 29.08% were in between 36-50 age groups, 23.95% of them were in between the age group of 51-65 and 30.99% were in the > 65 age group. The percentage of the second and last age group amounts to 60%, which is due to higher percentage of higher percentage of customers in the hospitals. In terms of type of treatment 34.98% were taken treatment as inpatients and 65.02% were as outpatients. Coming to the level of education 24.90% of the respondents were primary, 34.98% of customers were secondary level, 18.82% were graduates and 21.92% were above post graduates. 40% of the respondents were highly educated category and It indicates that majority of the customers were educated. Coming to the type of hospital visit 58.94% of customers were first time visitors of the non-corporate hospitals, and 41.06% were second or repeat visitors to the hospital. In the level of employment status 19.96% were unemployed or house wives, 25.10% were government employees (state and central), 33.27% were private employees, 12.36% were self employed and 9.31% of respondents were retired people. Coming to the income category 34.79% of the patients were below one lakh category represent below poverty line, 37.45% were middle income group with

the range of one lakh to five lakhs and high income group people were 27.76%. final category of the demographic category is state wise distribution of sample from Odisha were 35.36%, Andhra Pradesh were 28.33% and 36.31% were Telangana representing equal distribution among the three states. The sample represents homogeneous distribution among all the categories of the respondents.

**Table 6.1: Demographic characteristics of the respondents (n=526)**

Demographic Characteristics	Variable	Frequency	%
Gender	Male	316	60.07
	Female	210	39.92
Age	18 to 35 years	84	15.96
	36 to 50 years	153	29.08
	51 to 65 years	126	23.95
	>65 years	163	30.99
Type of Treatment	Inpatient	184	34.98
	Outpatient	342	65.02
Level of Education	Primary level	131	24.90
	Secondary level	184	34.98
	Graduates	99	18.82
	Above post graduation	112	21.92
Hospital visit	First visit	310	58.94
	Repeat visit	216	41.06
Employment status	Unemployed/House wife	105	19.96
	Government employee	132	25.10
	Private employee	175	33.27
	Self-employed	65	12.36
	Retired	49	9.31
Income group	Low (< Rs. 99,000)	183	34.79
	Middle (Rs. 1,00,000 to 5,00,000)	197	37.45
	High (> Rs. 5,00,000)	146	27.76
State wise distribution of sample	Odisha	186	35.36
	Andhra Pradesh	149	28.33
	Telangana	191	36.31

### **6.3 Scale development**

Developing a scale for analyzing perceived service quality, customer satisfaction, loyalty and behavioural intention involved following steps: perceived service quality, customer satisfaction and loyalty variables or items taken from previous studies (Parasuraman et al., 1988; Boulding et al., 1993; Taylor & Baker, 1994; Youssef et al., 1996; Lam, 1997; Andaleeb, 2001; Sower et al., 2001; Sureshchandar et al., 2002; White & Yu, 2005; Olorunniwo et al., 2006; Bigné et al., 2008; Ramsaran-Fowdar, 2008; Aagja & Garg, 2010). The questionnaire was pre-tested several times to ensure that the format, total questions and sequence check. During each successive pre-test, feedback was obtained from customers and their accompanying persons; doctors and staff from five different private hospitals. The final questionnaire was translated into the native language Odiya and Telugu for the convenience of the respondents by two language experts independently and was translated back into English to check the consistency and rectify grammatical error and subsequent modifications were made as per requirement. Collected data were subjected to analyzed with different statistics such as exploratory factor analysis, confirmatory factor analysis and structural equation modeling analyses used through SPSS and AMOS-20.

### **6.4 Exploratory Factor Analysis for Customer Perceived Service Quality**

The suitability of data for exploratory factor analysis was tested utilizing Barlett's test and Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy. Barlett's test of sphericity was employed first to test for inter-correlation. KMO measure of sampling adequacy was also applied to ensure that the variables were grouped appropriately or not. The KMO overall measure for sampling adequacy was calculated as 0.852. According to Kaiser (1974) a score of 0.80 and above is acceptable; however, another researcher Field (2009) indicates that 0.50 is an acceptable limit. Since the KMO was above 0.80, the variables were interrelated and they share common factors. In addition to this, Barlett's test of sphericity  $\chi^2=14336.144$ ,  $p<001$  indicated that correlations between items were large enough to accommodate principal component analysis. In essence the fulfillment of the two tests signified that factor analysis was feasible and the data were suitable for factor analysis (Hair *et al.*, 2009). Table 6.2 below shows the result of KMO and Bartlett's tests.

**Table 6.2: KMO and Bartlett's Test for CPSQ questionnaire**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.852
Bartlett's Test of Sphericity	Approx. Chi-Square	14336.144
	df	741
	Sig.	.000

Item reliability was assessed by computing the coefficient  $\alpha$  (Cronbach, 1951), which measures the internal consistency. Coefficient ( $\alpha$ ) should be above 0.7 (Nunnally, 1978). In our study, Cronbach's alpha ( $\alpha$ ) was 0.892, which indicates good consistency among items. The reliability statistics for CPSQ was shown in table 6.3.

**Table 6.3: Reliability Statistics for CPSQ**

Cronbach's Alpha	N of Items
.892	39

***Principal Components Analysis (PCA) – Customer perceived service quality dimensions***

Using Principal Components Analysis (PCA) with varimax rotation and Kaiser normalization, 39 out of the original 55 attributes culminated to nine factors representing 71.901% of the explained variance (see Table 6.4). The nine factors have a loading value of more than 0.5 hence all factors were retained on this basis. In addition to high loading values, the factors also proved to be highly internally consistent. The reliability of factors was tested using Cronbach's alpha. The test resulted in alpha coefficients that range from 0.70 to 0.87. These were higher than the recommended minimum value in the literature. Nunnally & Bernstein (1994) indicated 0.7 as an acceptable reliability coefficient for social science research but lower baseline, as much as 0.50, (Choi & Chu, 1999) have been used for accepting test of reliability. All the factors had eigen values greater than or equal to 1.0 this helped in deciding the factors to be included in the analysis as suggested by Gorsuch (1983). Tabachnick & Fidell (2007) recommend that eigen values lower than 1.0 or with negative values should not be included in the analysis. In this analysis items eigen values with lower-than-1.0 or negative values were not included. Communality is the measure of the proportion of each variable's variance that can be explained by the factors. The communality values indicated that all the variables account for more than 70% variance in each factor.

**Table 6.4: Total Variance Explained for perceived service quality dimensions**

Dimensions	Eigen value	% of Variation	Cumulative %
Reliability and responsiveness	9.038	11.202	11.202
Physical Environment	3.991	10.924	22.126
Empathy	3.309	7.936	30.061
Efficiency	2.705	7.515	37.576
Timeliness	2.299	7.455	45.031
Transparency	1.865	7.291	52.322
Affordability	1.757	7.197	59.518
Communication	1.690	6.789	66.307
Consistency	1.385	5.594	71.901

\* Extraction Method: Principal Component Analysis.

**Table 6.5: Rotated Component Matrix for Customer Perceived service quality**

Variable	Components								
	R&R	PE	EMP	EFF	TML	TRP	AFF	COM	CON
R&R3	.831								
R&R4	.827								
R&R5	.805								
R&R6	.803								
R&R1	.754								
R&R2	.724								
PE4		.820							
PE2		.802							
PE3		.782							
P55		.761							
PE1		.742							
PE6		.740							
EMP4			.936						
EMP1			.911						
EMP2			.793						
EMP3			.741						
EFF1				.930					
EFF2				.916					
EFF3				.763					
EFF4				.728					

TML1		.912	
TML4		.784	
TML2		.781	
TML3		.732	
TRP1		.844	
TRP3		.812	
TRP2		.794	
TRP4		.698	
AFF4		.825	
AFF3		.808	
AFF2		.784	
AFF1		.726	
COM1			.804
COM2			.771
COM3			.768
COM4			.742
CON3			.838
CON2			.834
CON1			.794

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations

The nine factors identified are as follows: Factor 1 – reliability and responsiveness, Factor 2 – physical environment, Factor 3 - empathy, Factor 4 - efficiency, Factor 5 – timeliness Factor 6 – transparency Factor 7 – affordability Factor 8 – communication and Factor 9 – consistency. Factor 1 consisted of six attributes and explained 11.202% of the variance in the data with an eigenvalue of 9.038. This factor had items that were associated with reliability and responsiveness to get involved in service activities in hospitals. Factor 2 also contained six items that described physical environment in the hospitals and this accounted for 10.924% of the variance in the data. Factor 3 explained 7.936% of the variance and addressed empathy relating to customers’ by physicians and nurses. Factor 4 explained about the efficiency of the hospital as well as staff with the variance of 7.515%. Factor 5 associated with timeliness treatment in the premises of service providers as timeliness dimension with the explained variance of 7.455%. Another important factor 6 is transparency in the private hospitals with 7.291% of variance is explained. Factor 7 named as affordability as the variance of 7.197%. Factor 8 communication with variance of 6.789% it examines the doctors and staff are using layman’s language in the time of treatment. All these factors from empathy to communication with four items each continuously. The last factor consistency – factor 6

was associated with long term services with high quality. This factor explained 5.594% of the variance extracted. Table 6.5 shows rotated component matrix for customer perceived service quality used in determining the customer perceived service quality enablers. Generally, factor loading represents how much a factor explains to that particular variable. High loading indicates that the factor strongly influences the variable/s. A thumb rule of factor loading score  $>0.7$  has a high impact on the variables. Table 6.3 shows all factor loading scores; it indicates one variables in the transparency factor was  $<0.7$  need attention for service quality improvement in Indian private hospital contexts.

## **6.5 Measures for Customer Perceived Value**

We have gone through the literature and found that Customer perceived value can be comprised of four major constructs namely functional value (performance/quality), acquisition value (overall net value concept), social value (social self-concept) and lastly transaction value (psychological satisfaction gain from service encounter). These dimensions in brief are discussed below:

**Functional Value:** The utility derived from the product/service due to the reduction of its perceived short term and longer term costs (Sweeney & Soutar, 2001). It also represents value derived from effective task fulfillment.

**Acquisition Value:** It refers perceived net gains accrued when products or services are acquired, which is commonly referred to as the tradeoff between benefits and sacrifices (Mathwick et al., 2002). Customer acquisition value model is developed by Zeithaml, (1988) considers Customer perceived value as the perceived net gains connected with the services acquired. So the perceived acquisition value of services might positively influenced by benefits. Customers believe they are getting by acquiring and using services of the hospital and negatively influenced by the money given up to acquire the services.

**Social value:** It refers the utility derived from the product/service's ability to enhance social self-concept (Sweeney & Soutar, 2001). It also refers to the customer's interaction with doctors, staff, family members, friends and other customers during the services receiving time. Social interaction theory focuses on people being altruistic, being interconnected, and seeking acceptance and affection in interpersonal relationships.

**Transaction value:** Relates to psychological satisfaction or pleasure or relief gained from getting "services performed" (Grewal et al., 1998; Parasuraman & Grewal, 2000). The user of the services assesses the value of a deal by comparing the sale value to internal reference prices (Grewal et al., 1998). For example, in the healthcare setting the



transaction value for a patient is feeling safe in the hands of the doctors and receiving post-medical treatment, personal care, and good medical advice. Therefore, upon examining the price offer, patient might perceive additional value beyond that provided by acquisition value. Hence, perceived transaction value is the perception of psychological satisfaction obtained from taking advantage of price deal (Grewal et al., 1998).

**Table 6.6: KMO and Bartlett's Test for Customer Perceived Value**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.801
Bartlett's Test of Sphericity	Approx. Chi-Square	2491.113
	df	91
	Sig.	.000

**Table 6.7: Reliability Statistics for CPV variables**

Cronbach's Alpha	N of Items
.820	14

***Principal Components Analysis (PCA) – perceived value***

An exploratory factor analysis was also conducted to identify the underlying factors that describe the variance in the construct – Customer perceived value. Again, using Principal Components Analysis (PCA) with varimax rotation fourteen value items were analysed. Respondents were requested to indicate their level of agreement with the fourteen items on a 5 point Likert scale labeled as ‘Strongly Disagree’, ‘Disagree’, ‘Neither Agree Nor Disagree’, ‘Agree’, and ‘Strongly Agree’. As stated in sub-section 3.8.2.1 the value items were derived from Sweeney & Soutar (2001) Mathwick et al., (2002), Grewal et al., (1998), Parasuraman & Grewal, (2000). The fourteen attributes used in analyzing customer perceived value produced four factors representing 65.305% of the explained variance (Table 6.6).

**Table 6.8: Total Variance Explained for customer perceived value**

Dimensions	Eigen value	% of Variation	Cumulative %
Functional values	4.315	18.660	18.660
Acquisition Value	1.939	17.422	36.082
Social value	1.600	15.655	51.737
Transaction value	1.288	13.568	65.305

\* Extraction Method: Principal Component Analysis.

All the factors had a loading value of more than 0.727. The four factors identified are as follows: Factor 1 – functional value consisting of four items with highest factor loading of 0.834 and lowest value of 0.744. Factor 2 – acquisition value also had four items with higher loadings of 0.793 and least factor loading with 0.727. Factor 3 – functional value consisted of three items with factor loading ranged between 0.860 to 0.789. The last factor of customer perceived value is transaction value also consist with three items with the loading of 0.810, 0.766 and 0.733. Table 6.5 shows details of the results of the factor analysis for customer perceived value. The dimensions that emerged from the factor analysis confirmed Sweeney & Soutar’s (2001) PERVAL scale. However, in this study, quality dimension was not integrated in the measure as done in Sweeney & Soutar’s (2001) and similar value studies. Because performance of the CPSQ attributes was measured separately.

**Table 6.9: Rotated Component Matrix for customer Perceived value**

Variables	Components			
	Functional	Acquisition	Social value	Transaction
FV2	.824			
FV1	.781			
FV3	.771			
FV4	.744			
AV2		.793		
AV1		.763		
AV4		.730		
AV3		.727		
SV2			.860	
AV3			.842	
SV1			.789	
TV2				.810
TV1				.766
TV3				.733

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

## 6.6 Proposed hypotheses for managing customer perceived servqual

- H<sub>1</sub>: Customer perceived service quality has a positive influence on customer satisfaction.  
H<sub>2</sub>: Customer perceived service quality has a positive impact on customer perceived value.  
H<sub>3</sub>: Customer perceived value has a positive influence on Customer satisfaction.  
H<sub>4</sub>: Customer satisfaction has a positive influence on customer loyalty.  
H<sub>5</sub>: Customer perceived service quality has a significant impact on customer loyalty.  
H<sub>6</sub>: Customer perceived service quality has a significant impact on behavioural intention  
H<sub>7</sub>: Customer satisfaction has a positive influence on behavioural intention.  
H<sub>8</sub>: Customer loyalty has a positive influence in behavioural intention of customers.  
H<sub>9</sub>: Customer perceived value has a significant impact on customer loyalty.  
H<sub>10</sub>: Customer perceived value has a significant impact on behavioural intention.

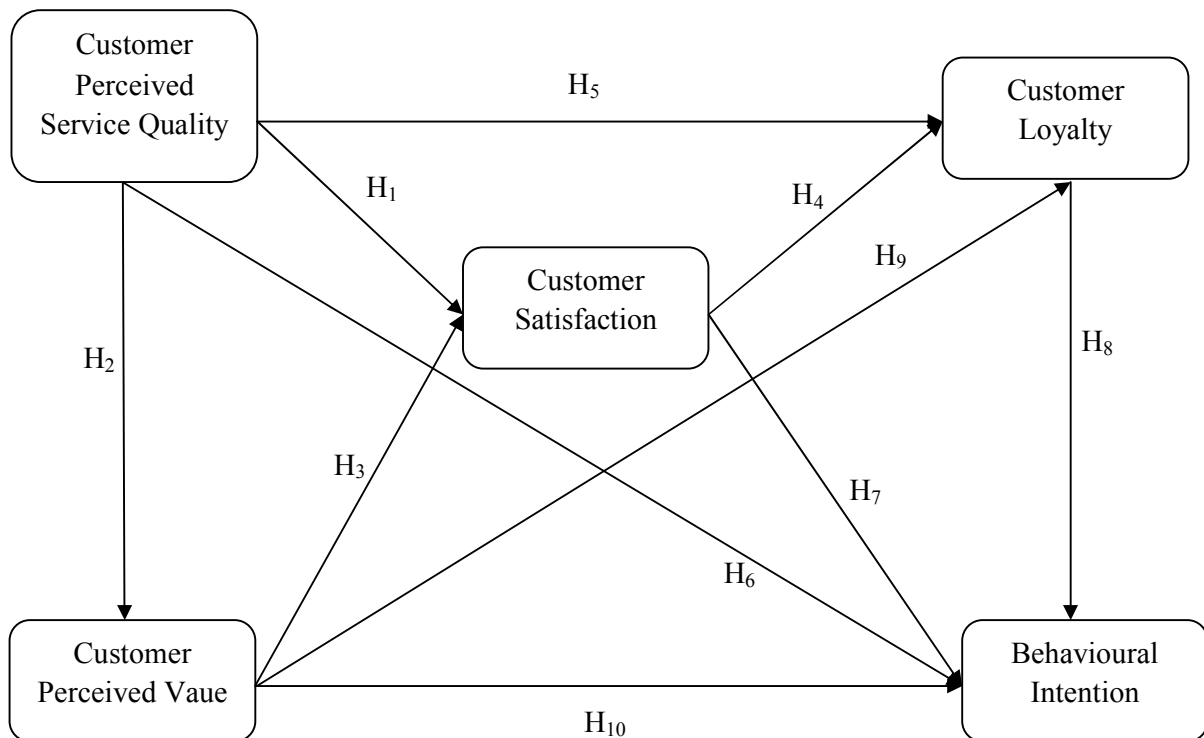


Figure 6.1: Proposed Model for managing service quality in private healthcare setting

### *Mediation Hypotheses*

- H<sub>11</sub>: Customer Satisfaction mediates the influence of perceived service quality on customer loyalty (CPSQ->CS->CL).  
H<sub>12</sub>: Customer satisfaction mediates the influence of perceived service quality on behavioural intention (CPSQ->CS->BI).  
H<sub>13</sub>: Customer satisfaction mediates the influence of customer perceived value on customer loyalty (CPV->CS->CL).  
H<sub>14</sub>: Customer satisfaction mediates the influence of customer perceived value on behavioral intention (CPV->CS->BI).

## 6.7 Confirmatory Factor analysis

### 6.7.1 Construct validity for Customer perceived service quality

Construct validity can be established by empirically assessing unidimensionality, convergent validity, discriminate validity (O’Leary-Kelly & Vokurka, 1998) and nomological validity (Sureshchander et al., 2002). Another researcher Hair et al. (2010) defined in their book as “construct validity is the extent to which a set of measured variables actually represents the theoretical latent construct those are designed to measure”. Researchers can assess uni-dimensionality i.e., the extent to which items on a factor measure one single construct with either EFA or CFA (Hair et al., 2008). As CFA offers better result interpretation of uni-dimensionality. In this thesis we have established the reliability with face validity, convergent validity and discriminant validity. Face validity was established by adopting the scales from the existing literature and adapting it to the current study environment. The Cronbach’s alpha of the instrument is 0.955, which is acceptable and shows that the questionnaire is reliable. CFA was used to estimate the convergent validity, discriminant validity and goodness of fit statistics. The three important indicators of convergent validity are factor loadings (standardized estimates), average variance extracted (AVE) and composite reliability (CR).

**Table 6.10: Discriminant Validity for Customer Perceived ServQual Dimensions**

Dimensions	COM	R&R	PE	EMP	EFF	TML	TRP	AFF	CON
COMMU	0.716								
R&R	0.379	0.798							
PE	0.282	0.366	0.748						
EMP	0.382	0.375	0.456	0.737					
EFF	0.305	0.516	0.486	0.353	0.819				
TML	0.339	0.369	0.362	0.229	0.594	0.839			
TRP	0.250	0.528	0.480	0.312	0.495	0.324	0.805		
AFF	0.365	0.654	0.468	0.337	0.631	0.589	0.463	0.788	
CON	0.293	0.195	0.198	0.192	0.227	0.151	0.217	0.188	0.800

The results are given in table 6.7. The standardized factor loadings of each construct are ranging from 0.587 to 0.905 and are statistically significant (p-values). The average variation extracted among the items of a constructs for communication-0.512; Reliability and responsiveness- 0.637; Physical Environment-0.560; Empathy-0.543;

Efficiency-0.671; Timeliness-0.704; Transparency-0.649; Affordability-0.621 and Consistency-0.641. The squared sum of factor loadings for each construct and the sum of the error variance terms for all construct which is CR for communication-0.839; Reliability and responsiveness-0.933; Physical Environment-0.898; Empathy-0.892; Efficiency-0.924; Timeliness-0.922; Transparency-0.902; Affordability-0.891 and Consistency-0.876. As suggested by Hair et al. (2010), a good rule of thumb is, a construct should have standardized loading estimates of 0.5 or higher and statistically significant; AVE of 0.5 or higher recommend adequate convergence, and reliability estimate of 0.5 or higher suggest good reliability. The results of standardized estimates, AVE and CR are all in the strongly standard region which confirms the convergent validity. From table 6.7, it can be inferred that square root of AVE values of all constructs of customer perceived service quality are greater than the inter-construct correlations which supports the discriminant validity of the constructs shown in Table 6.6. Measurement model for perceived service quality confirms an acceptable model fit of data with  $\chi^2/df=2.580$ , AGFI=0.785, CFI=0.897, GFI = 0.878, NFI=0.843, and RMSEA=0.055 these values indicates the uni-dimensionality of factor model.

**Table 6.11: Measurement model for Customer Perceived service quality Dimensions**

Dimensions	ITEMS	SFL	CR	AVE
Communication	COM3	.799	0.822	0.537
	COM2	.764		
	COM4	.727		
	PSQ81	.633		
Reliability & responsiveness	R&R6	.831	0.909	0.624
	R&R4	.827		
	R&R5	.846		
	R&R1	.762		
	R&R2	.726		
	R&R3	.742		

Physical Environment	PE4	.800	0.880	0.551
	PE3	.779		
	PE2	.779		
	PE5	.781		
	PE1	.708		
	PE6	.587		
Empathy	EMP3	.759	0.810	0.516
	EMP4	.744		
	EMP2	.720		
	EMP1	.647		
Efficiency	EFF4	.848	0.906	0.705
	EFF2	.839		
	EFF1	.830		
	EFF3	.843		
Timeliness	TML2	.849	0.907	0.709
	TML3	.894		
	TML4	.864		
	TML1	.757		
Transparency	TRP4	.801	0.876	0.638
	TRP3	.800		
	TRP2	.833		
	TRP1	.761		
Affordability	AFF4	.803	0.879	0.644
	AFF3	.855		
	AFF2	.734		
	AFF1	.815		
Consistency	CON3	.905	0.845	0.647
	CON2	.806		
	CON1	.688		

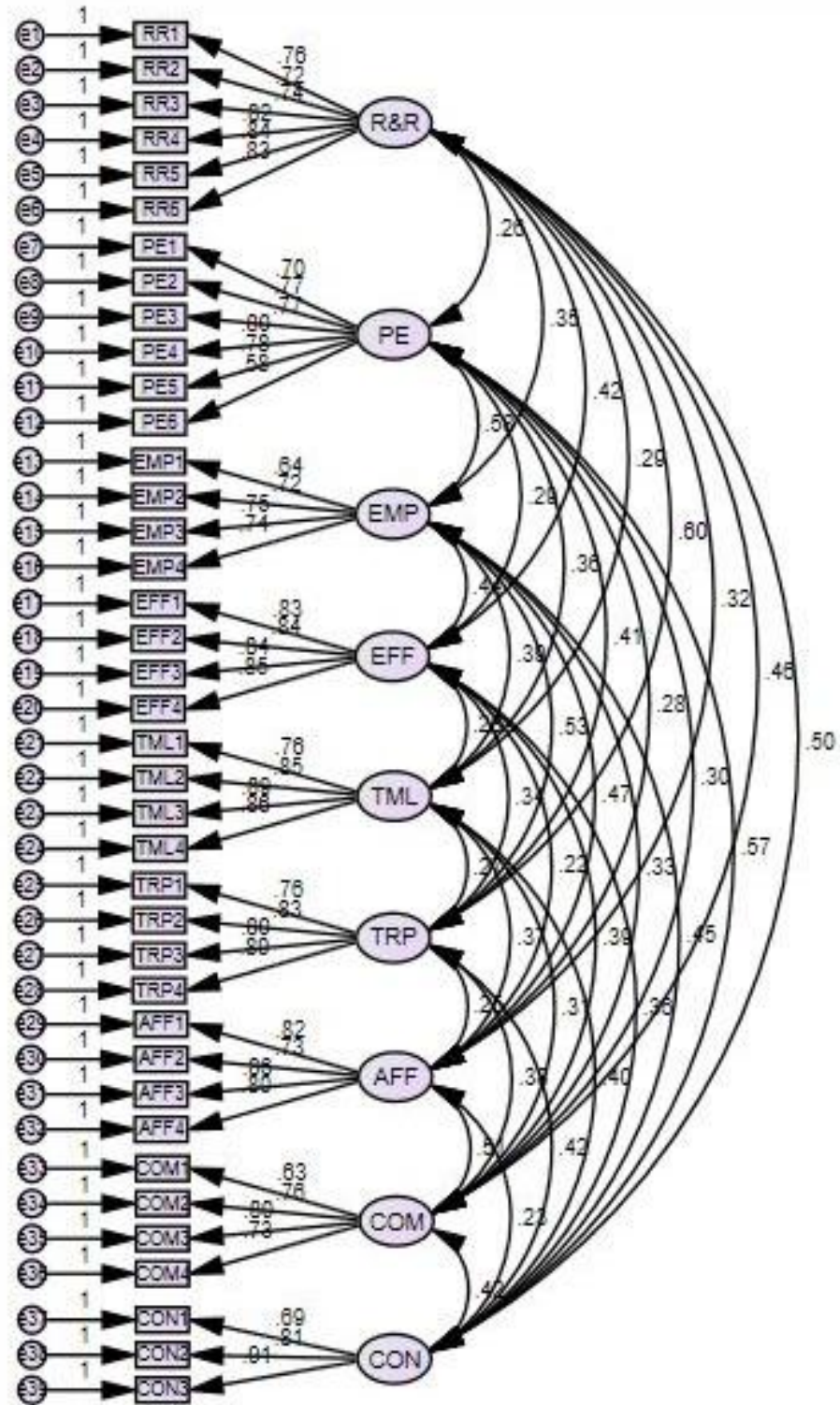


Figure 6.2: Measurement model for Customer perceived service quality

## 6.7.2 Confirmatory Factor Analysis for Customer Perceived Value

### 6.7.2.1 Construct Validity for customer perceived value

Construct validity can be established by empirically assessing uni-dimensionality, convergent validity, discriminate validity (O’Leary-Kelly & Vokurka, 1998) and nomological validity (Sureshchander et al., 2002). Another researcher Hair et al. (2010) defined in their book as “construct validity is the extent to which a set of measured variables actually represents the theoretical latent construct those are designed to measure”. Researchers can assess uni-dimensionality i.e., the extent to which items on a factor measure one single construct with either EFA or CFA (Hair et al., 2008). As CFA offers better result interpretation of uni-dimensionality.

**Table 6.12: Discriminant Validity for Customer Perceived Value Dimensions**

Dimensions	Functional	Acquisition	Social value	Transaction
Functional value	0.779			
Acquisition value	0.414	0.747		
Social value	0.318	0.381	0.723	
Transaction value	0.225	0.364	0.488	0.740

The Cronbach’s alpha for the customer perceived value scale is 0.822, which is acceptable and shows that the scale was reliable. CFA was used to estimate the convergent validity, discriminant validity and goodness of fit statistics. The three important indicators of convergent validity are factor loadings (standardized estimates), average variance extracted (AVE) and composite reliability (CR). The results of are given in table 6.7. The standardized factor loadings of each construct are ranging from 0.613 to 0.871 and are statistically significant (p-values). The average variation extracted among the items of a constructs for functional value-0.606; acquisition value- 0.557; social value-0.522; and transaction value-0.547. The squared sum of factor loadings for each construct and the sum of the error variance terms for all construct which is CR for functional value-0.819; acquisition value-0.834; social value-0.814; and transaction value-0.784. As suggested by Hair et al. (2010), a good rule of thumb is, a construct should have standardized loading estimates of 0.5 or higher and statistically significant; AVE of 0.5 or higher recommend adequate convergence, and reliability estimate of 0.5 or higher suggest good reliability.



The results of standardized estimates, AVE and CR are all in the strongly standard region which confirms the convergent validity. From table 6.7, it can be inferred that square root of AVE values of all constructs of customer perceived service quality are greater than the inter-construct correlations which supports the discriminant validity of the constructs shown in Table 6.6. Measurement model for Customer perceived value confirms an acceptable model fit of data with  $\chi^2/df=2.112$ , AGFI=0.941, CFI=0.967, GFI = 0.960, NFI=0.940, and RMSEA=0.046. Thus, this measurement model reflects good construct validity and desirable perceived value properties.

**Table 6.13: Measurement Model for Customer Perceived Value Dimensions**

Dimensions	ITEMS	SFL	CR	AVE
Social Value	SV2	0.827	0.819	0.606
	SV3	0.871		
	SV1	0.613		
Functional Value	FV2	0.755	0.834	0.557
	FV1	0.772		
	FV3	0.739		
	FV4	0.719		
Acquisition Value	AV2	0.775	0.814	0.522
	AV1	0.704		
	AV4	0.697		
	AV3	0.712		
Transaction Value	TV2	0.765	0.784	0.547
	TV1	0.725		
	TV3	0.728		

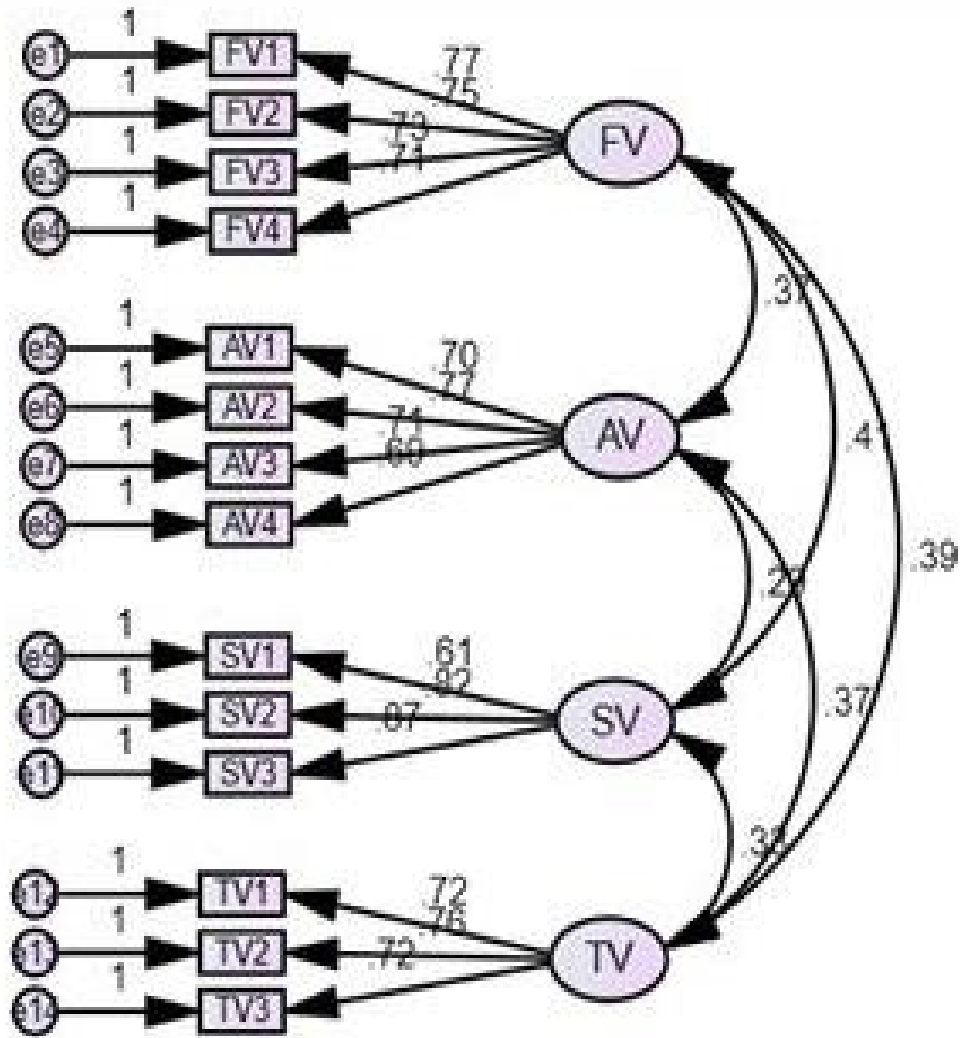


Figure 6.3: Measurement model for customer perceived value

### 6.7.3 CFA full model with second order

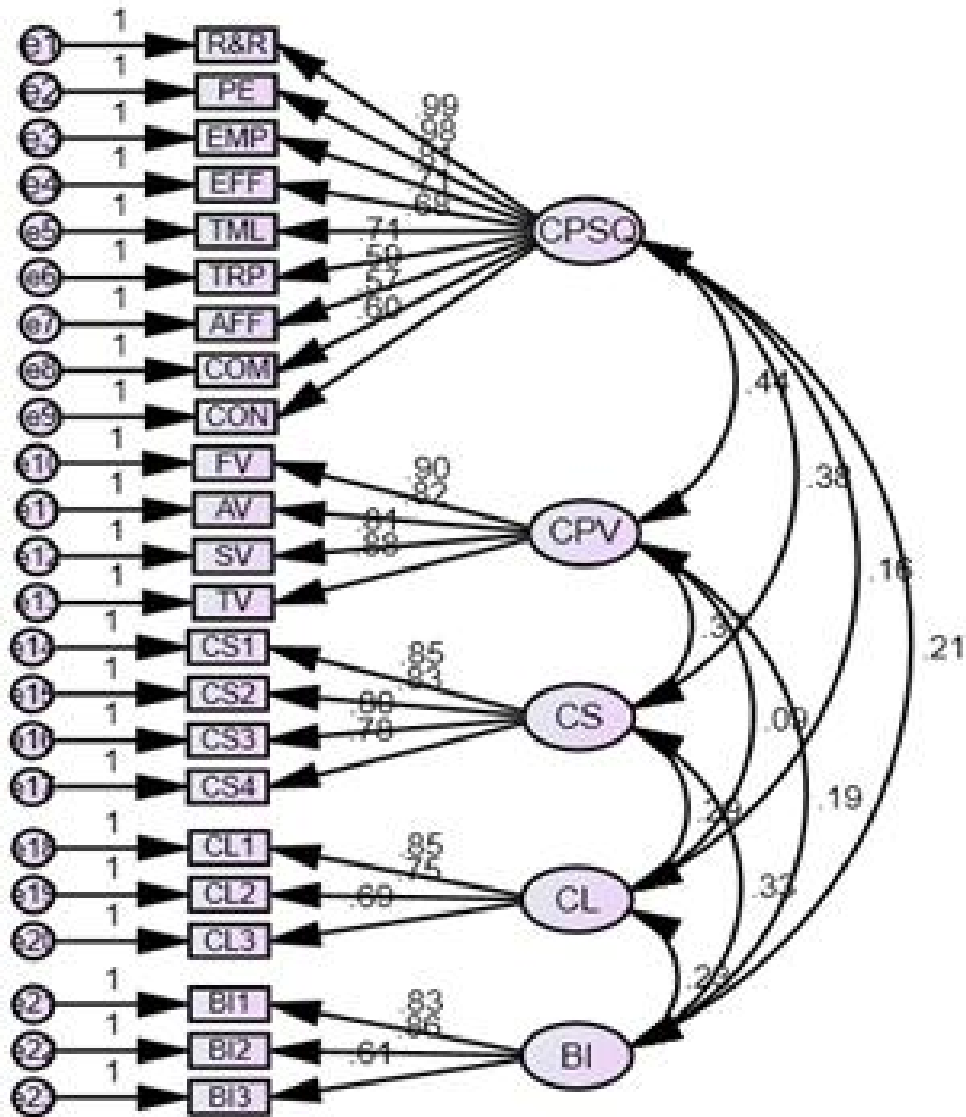
According to Brown (2006), higher-order (second-order) is a theory-driven procedure whereby the researcher imposes a more parsimonious structure on the interrelationships among the factors obtained in the lower-order (first-order) confirmatory factor analysis. We further states that higher-order model is useful when the lower-order factors are distinctive and share a significant variance. A higher-order confirmatory factor analysis tests a theory-based account of the interrelationships between the lower-order factors and the higher-order factors that have direct effects on the lower-order factors.

**Table 6.14: Discriminant Validity for Overall model**

Dimensions	CL	CPSQ	CPV	CS	B I
Customer Loyalty	0.771				
Customer Perceived Service Quality	0.269	0.756			
Customer Perceived Value	0.326	0.332	0.858		
Customer Satisfaction	0.251	0.461	0.306	0.820	
Behavioural Intention	0.299	0.371	0.364	0.283	0.779

**Table 6.15: Measurement model for overall model**

Dimensions	ITEMS	SFL	CR	AVE
Customer Loyalty	CL1	.856	0.813	0.594
	CL2	.756		
	CL3	.691		
Customer Perceived Service Quality	Reliability & responsiveness	.993	0.920	0.571
	Physical Environment	.981		
	Empathy	.810		
	Efficiency	.711		
	Timeliness	.685		
	Transparency	.719		
	Affordability	.590		
	Communication	.577		
Customer Perceived Value	Functional Value	.906	0.918	0.737
	Acquisition Value	.829		
	Social Value	.812		
	Transaction Value	.883		
Customer Satisfaction	CS1	.857	0.891	0.672
	CS2	.839		
	CS3	.800		
	CS4	.780		
Behavioral Intention	BI1	.832	0.819	0.606
	BI2	.863		
	BI3	.618		



**Figure 6.4: Measurement model for managing overall service quality**

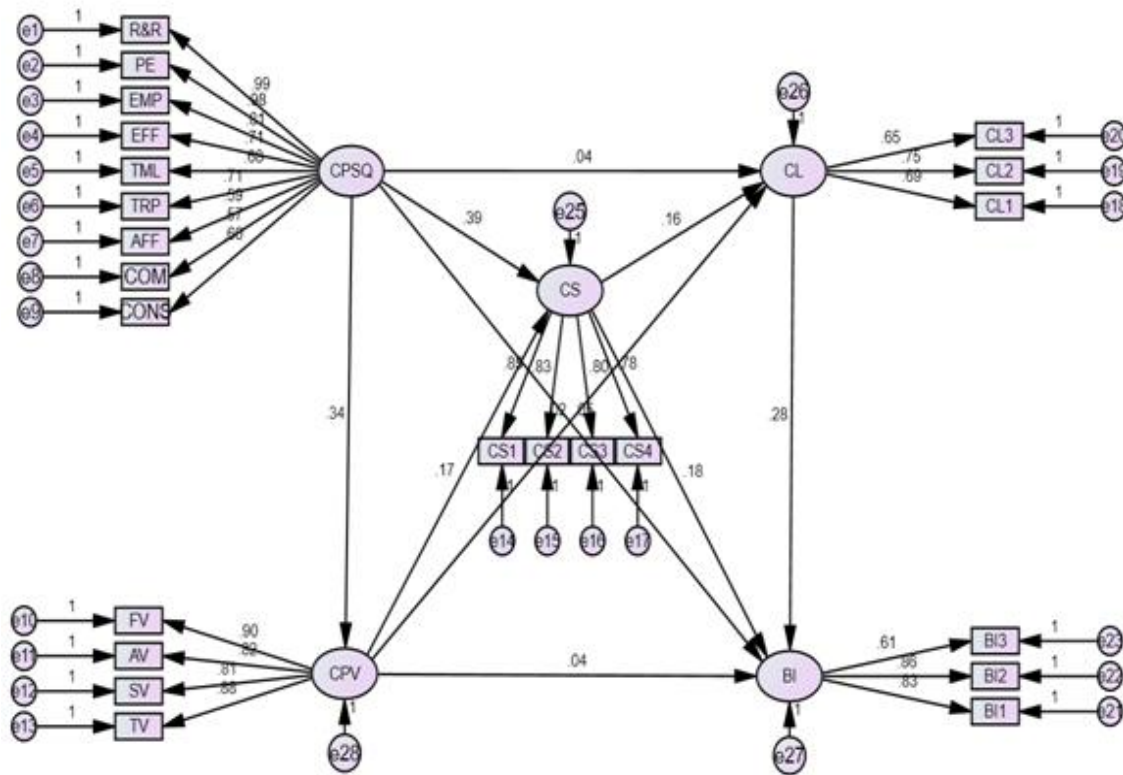
The Cronbach's alpha for the customer perceived service quality is 0.944; customer perceived value is 0.916; Customer Satisfaction -0.890; Customer Loyalty – 0.808 and Behavioural Intention – 0.812. Cronbach's alpha for overall model is 0.920. which is acceptable and shows that the scales are reliable. CFA was used to estimate the convergent validity, discriminant validity and goodness of fit statistics. The three important indicators of convergent validity are factor loadings (standardized estimates), average variance extracted (AVE) and composite reliability (CR). The results of are given in table 6.13. The standardized factor loadings of each construct are ranging from 0.577 to

0.993 and are statistically significant (p-values). The average variation extracted among the items of a constructs for Customer Loyalty-0.594; Perceived Service Quality- 0.571; Customer Perceived Value-0.737; Customer Satisfaction-0.672 and Behavioral intention-0.606. The squared sum of factor loadings for each construct and the sum of the error variance terms for all construct which is CR for Customer Loyalty-0.813; Perceived Service Quality- 0.920; Customer Perceived Value-0.918; Customer Satisfaction-0.891 and Behavioural intention-0.819. As suggested by Hair et al. (2010, p. 713), a good rule of thumb is, a construct should have standardized loading estimates of 0.5 or higher and statistically significant; AVE of 0.5 or higher recommend adequate convergence, and reliability estimate of 0.5 or higher suggest good reliability. The results of standardized estimates, AVE and CR are all in the strongly standard region which confirms the convergent validity. From Table 6.12, it can be inferred that square root of AVE values of all constructs of customer perceived service quality are greater than the inter-construct correlations which supports the discriminant validity of the constructs. Measurement model for five constructs i.e. CPSQ, CPV, CS, CL and BI confirms an acceptable model fit of data with  $\chi^2/df=2.77$ , AGFI=0.838, CFI=0.935, GFI = 0.872, NFI=0.914, and RMSEA=0.072. Thus, this measurement model reflects statistically good fit.

## **6.8 Structural model results**

To examine the influence of customer perceived service quality, value and customer satisfaction on customer loyalty and behavioural intentions, structural equation modeling was conducted. The predictive power of each of the variables was analysed and compared in a set of structured models testing both direct and indirect relationships. Measurement model indices confirms an acceptable model fit of data with  $\chi^2/df=1.83$ , AGFI=0.88, CFI=0.935, GFI = 0.91, NFI=0.945, and RMSEA=0.052. Thus, this structural model statistically fits well. The hypothesized positive relationship between customer perceived service quality and customer satisfaction ( $H_1$ ) was supported with beta coefficient 0.395 (p-value – 0.000). Hypothesis  $H_2$ , which predicted a positive relationship between customer perceived service quality and customer perceived value identification was also supported with beta coefficient 0.341 (p-value – 0.000). Hypothesis  $H_3$ , which predicted a positive relationship between customer perceived value and customer satisfaction identification was supported with beta coefficient 0.174 (p-value – 0.000). Hypothesis  $H_4$ , which predicted a positive relationship between customer satisfaction and customer loyalty identification was supported with beta coefficient 0.160 (p-value – 0.000).  $H_5$ , which predicted a positive relationship between customer perceived service quality and

customer loyalty identification was not supported with beta coefficient 0.041 (not significant; p-value – 0.216). H<sub>6</sub>, which predicted a positive relationship between customer perceived service quality and behavioural intention identification, was not supported with beta coefficient 0.0920 (not significant p-value – 0.249). Hypothesis H<sub>7</sub>, which predicted a positive relationship between customer satisfaction and behavioral intention identification was supported with beta coefficient 0.186 (p-value – 0.000). Hypothesis H<sub>8</sub>, which predicted a positive relationship between customer loyalty and behavioral intention identification was supported with beta coefficient 0.288 (p-value – 0.000). Hypothesis H<sub>9</sub>, which predicted a positive relationship between customer perceived value and customer identification was not supported with beta coefficient 0.051 (not significant, p-value – 0.122). Hypothesis H<sub>10</sub>, which predicted a positive relationship between customer perceived value and behavioral intention identification was not supported with beta coefficient 0.046 (p-value – 0.000). For the hypotheses H<sub>9</sub> and H<sub>10</sub> the predicted values are positive but low beta coefficient and not significant with p-value. The predicted relationships standardized path coefficients, p-values of the hypothesis and hypothesis outcomes are provided in the above table 6.14.



**Figure 6.5: Validated Structural Model for managing customer perceived service quality**

**Table 6.16: Testing of Hypotheses**

<b>Hypotheses</b>	<b>Relationship</b>	<b>Beta coefficient</b>	<b>T value</b>	<b>p-value</b>	<b>Result</b>
H <sub>1</sub>	CPSQ→CS	0.395	8.821	0.000	Accepted
H <sub>2</sub>	CPSQ→PV	0.341	7.421	0.000	Accepted
H <sub>3</sub>	CPV→CS	0.174	3.799	0.000	Accepted
H <sub>4</sub>	CS→CL	0.160	2.101	0.000	Accepted
H <sub>5</sub>	CPSQ→CL	0.041	1.912	0.216	<b>Rejected</b>
H <sub>6</sub>	CPSQ→BI	0.092	3.567	0.249	<b>Rejected</b>
H <sub>7</sub>	CS→BI	0.186	1.463	0.000	Accepted
H <sub>8</sub>	CL→BI	0.288	2.877	0.000	Accepted
H <sub>9</sub>	CPV→CL	0.051	2.913	0.122	<b>Rejected</b>
H <sub>10</sub>	CPV→BI	0.046	4.322	0.189	<b>Rejected</b>

### **6.8.1 Mediation**

In our research the objectives is to establish or test how the independent variable (X) exerts its effect on dependent variable (Y) frequently postulates a model in which one or more intervening variable (M) is located casually between independent and dependent variables. These intervening variables often called mediators are conceptualized as the mechanism through independent variable influences dependent variable, i.e., variation in independent variable causes variation in one or more mediators of intervening variables, which in turn causes variation in dependent variable. Baron & Kenny (1986) suggest regressing (i) mediators on the independent variables, (ii) dependent variables on the independent variables and (iii) dependent variables on both the independent variables and mediators. Hopwood (2007) pointed based on Baron & Kenny (1986) method; structural equation model method has advantages over multiple regression in testing mediating effects. Generally researchers interested in examining questions about mechanism resort to process modeling to empirically estimate and test hypotheses about the two pathways of influence through which independent variable varies its effect on dependent variable depicted. On direct from independent to dependent and the other indirect through intervening variable. More popularly known as mediation analysis, this type of analysis is extremely common in virtually all disciplines including healthcare services. Some of the

most highly cited research papers in methodology (Baron & Kenny, 1986; Mackinnon et al., 2002; Preacher & Hayes 2004, 2008) discuss mediation analysis and various statistical approaches to quantifying and testing hypotheses about direct and indirect effects of independent and dependent variable. It is not necessary mediator models specify observed variables and there are some advantages to specifying latent variables. In our current research, all variables are latent variables. So based on Baron & Kenny (1986) method and Hopwood's (2007) procedures, we test the mediating roles of customer satisfaction with customer perceived service quality; customer perceived value and customer loyalty and behavioral intention was tested.

When empirically testing a causal process that involves a mediation component, of primary interest is the estimation and interpretation of the direct and indirect effects along with inferential tests thereof. To derive these effects one must also estimate the constituent components of the indirect effect, meaning the effect of independent on intervening variable as well as the effect of intervening on dependent variable. Although the constituent components of the indirect effect are not of primary interest in modern mediation analysis. Many researchers often estimate the total effect of independent on dependent as well, although doing so is not required for the purpose of interpretation. The statistical simple mediation represents two equations:

$$\text{Inferential variable (M)} = i_1 + aX + e_M$$

$$\text{Dependent variable (Y)} = i_2 + cX + bM + e_Y$$

Where  $i_1$  and  $i_2$  are regression intercepts, where  $e_M$  and  $e_Y$  are errors in the estimation of inferential and dependent variables and  $a$ ,  $b$ ,  $c$  are the regression coefficients given to the antecedent variables in the model in the estimation of the consequents.

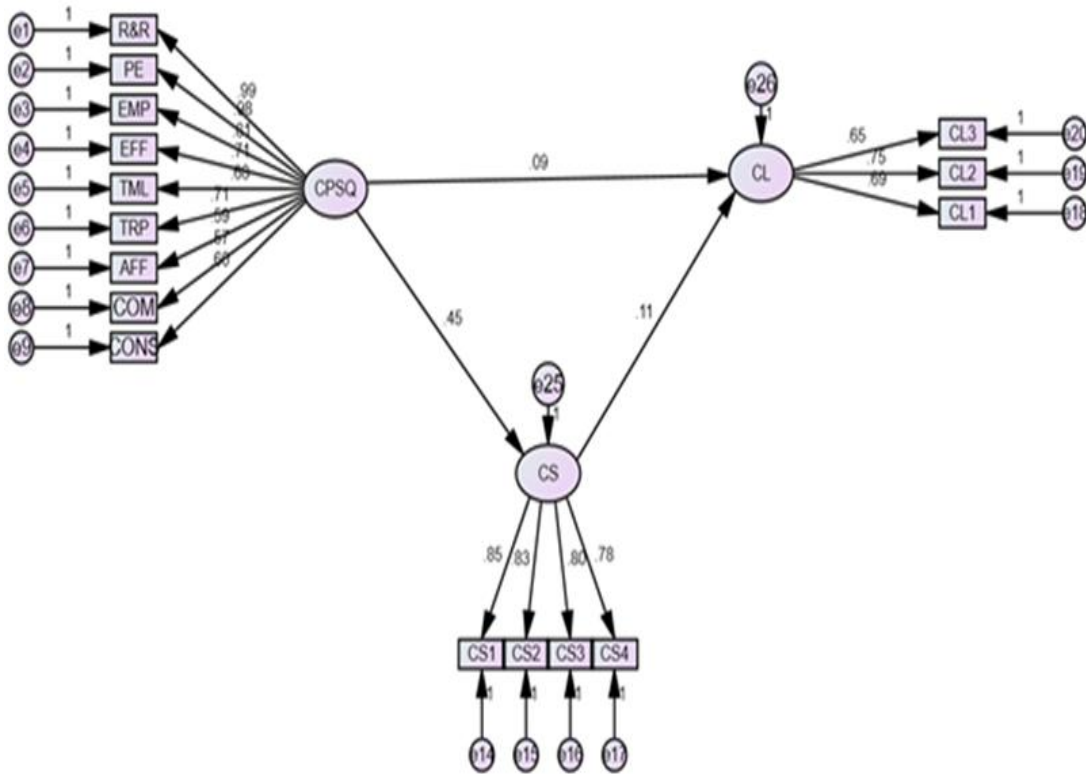
### **6.8.2 Mediated SEM for path coefficients between perceived service quality, customer satisfaction and customer loyalty:**

Hypotheses  $H_{11}$  was tested. To test the mediating effect of customer satisfaction, we first construct a structural equation model with perceived service quality and customer loyalty with mediator of customer satisfaction (Table 6.14). Measurement model for Customer perceived service quality confirms an acceptable model fit of data with  $\chi^2/df=2.657$ , AGFI=0.892, CFI=0.912, GFI = 0.934, NFI=0.890, and RMSEA=0.062. Thus, this structural model fits well.



**Table 6.17: Standardized path coefficients between customer perceived service quality, customer satisfaction and Customer Loyalty**

Predicted Relationship	Standardized path loadings	T-value	p-value
CPSQ→CS	0.453	10.551	***
CPSQ→CL	0.096	2.834	0.066
CS→CL	0.114	3.599	***



**Figure 6.6: Mediation model between CPSQ, CS and CL**

The hypothesized positive relationship between perceived service quality and customer satisfaction was supported with standardized path loading of PSQ→CS was 0.453; t-value- 10.551 statistically significant at  $p < 0.001$ . Hypothesized positive relationship between perceived service quality and customer loyalty was supported with standardized path loading of PSQ→CL was 0.096; t-value- 2.834 statistically no significant at  $p < 0.001$ . Hypothesized positive relationship between customer satisfaction and customer loyalty was supported with standardized path loading of CS→CL was 0.114; t-value- 3.599 statistically significant at  $p < 0.001$ .

**Table 6.18: Direct, Indirect and total effects of Perceived service quality on customer satisfaction and customer loyalty.**

Predicted Relationship	Direct Effect	Indirect Effect	Total Effect
CPSQ → CS	0.453*	----	0.453*
CPSQ→ CL	0.044(N.S)	0.114*	0.158*
CS→CL	0.114*	----	0.114

\*Statistically significant (p<0.001)

**6.8.3 Mediated SEM for path coefficients between customers perceived service quality, customer satisfaction and Behavioral intention:**

Hypotheses H<sub>12</sub> was tested. To test the mediating effect of customer satisfaction, we first construct a structural equation model with perceived service quality and behavioural intention with mediator of customer satisfaction (Table 6.16). Measurement model for Customer perceived service quality confirms an acceptable model fit of data with  $\chi^2/df=2.858$ , AGFI=0.837, CFI=0.948, GFI = 0.890, NFI=0.936, and RMSEA=0.067. Thus, this model fits statistically significant.

**Table 6.19: Standardized path coefficients between perceived service quality, customer satisfaction and Behavioral intention**

Predicted Relationship	Standardized path loadings	T-value	p-value
CPSQ→CS	0.453	10.552	***
CPSQ→BI	0.107	2.583	0.010
CS→BI	0.230	5.863	***

The hypothesized positive relationship between perceived service quality and customer satisfaction was supported with standardized path loading of PSQ→CS was 0.453; t-value- 10.552 statistically significant at p<0.001. Hypothesized positive relationship between perceived service quality and behavioral intention was supported with standardized path loading of PSQ→BI was 0.107; t-value- 2.583 statistically no significant at p<0.001. Hypothesized positive relationship between customer satisfaction and behavioral intention was supported with standardized path loading of CS→BI was 0.230; t-value- 5.863 statistically significant at p<0.001.

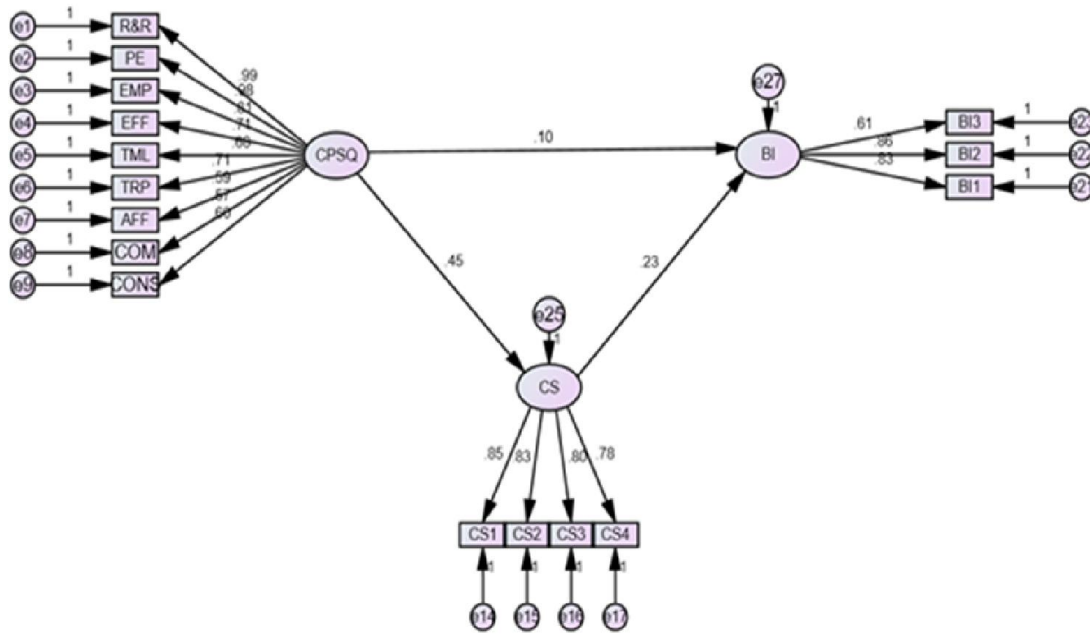


Figure 6.7: Mediation model between CPSQ, CS and BI

Table 6.20: Direct, Indirect and total effects of Perceived service quality on customer satisfaction and Behavioral Intention

Predicted Relationship	Direct Effect	Indirect Effect	Total Effect
PSQ → CS	0.453*	----	0.453*
PSQ → BI	0.050(N.S)	0.238*	0.288*
CS → BI	0.230*	----	0.230

\*Statistically significant (p<0.001)

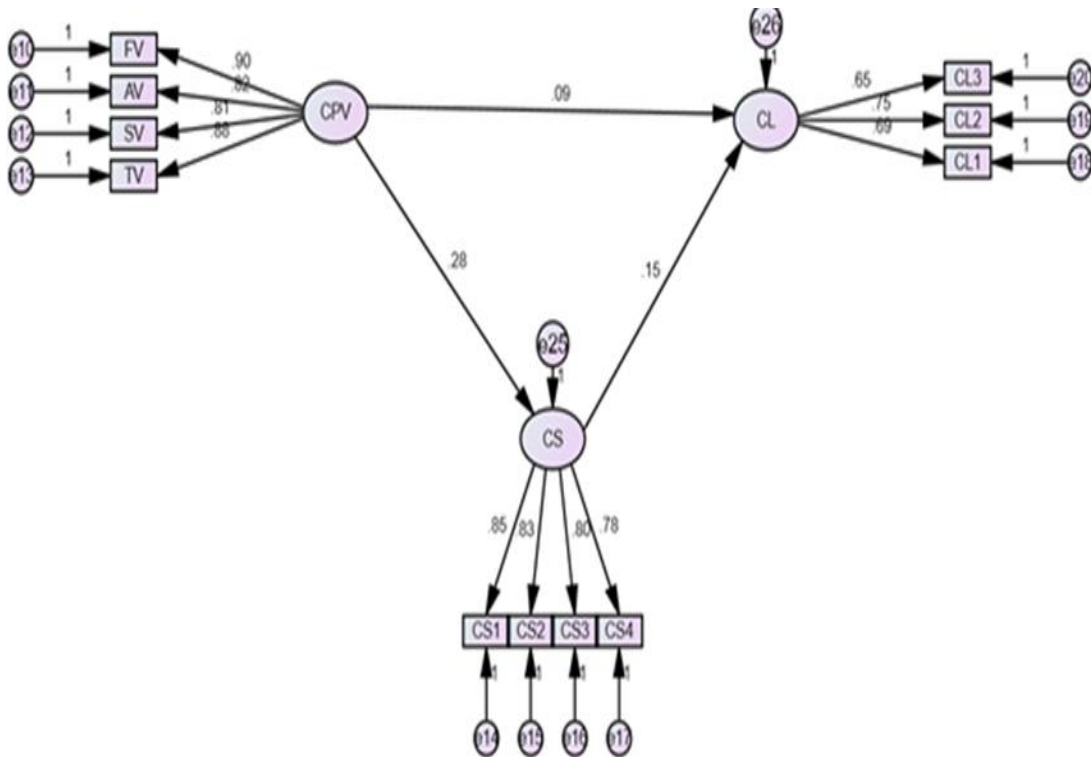
#### 6.8.4 Mediated SEM results for path coefficients between customer perceived value, customer satisfaction and customer loyalty:

Hypotheses H<sub>13</sub> was tested. To test the mediating effect of customer satisfaction, we first construct a structural equation model with customer perceived value and customer loyalty with mediator of customer satisfaction (Table 6.18). Measurement model for Customer perceived value confirms an acceptable model fit of data with  $\chi^2/df=2.335$ , AGFI=0.950, CFI=0.984, GFI = 0.969, NFI=0.972, and RMSEA=0.051. Thus, this structural model fits well.

**Table 6.21: Standardized path coefficients between Customer Perceived Value, customer satisfaction and Customer Loyalty**

Predicted Relationship	Standardized path loadings	T-value	p-value
CPV→CS	0.288	6.435	***
CPV→CL	0.099	3.222	***
CS→CL	0.154	5.353	***

The hypothesized positive relationship between customer perceived value and customer satisfaction was supported with standardized path loading of CPV→CS was 0.288; t-value- 6.435 statistically significant at  $p < 0.001$ . Hypothesized positive relationship between customer perceived value and customer loyalty was supported with standardized path loading of CPV→CL was 0.099; t-value- 3.222 statistically significant at  $p < 0.001$ . Hypothesized positive relationship between customer satisfaction and customer loyalty was supported with standardized path loading of CS→CL was 0.154; t-value- 5.353 statistically significant at  $p < 0.001$ .



**Figure 6.8: Mediation model between CPV, CS and CL**

**Table 6.22: Direct, Indirect and total effects of Customer Perceived Value on customer satisfaction, customer loyalty**

Predicted Relationship	Direct Effect	Indirect Effect	Total Effect
CPV→CS	0.288*	----	0.288*
CPV→CL	0.028(N.S)	0.154*	0.182*
CS→CL	0.154*	----	0.154

\*Statistically significant (p<0.001)

**6.8.5 Mediated results for path coefficients between customer perceived value, customer satisfaction and behavioral loyalty:**

Hypotheses H<sub>14</sub> was tested. To test the mediating effect of customer satisfaction, we first construct a structural equation model with customer perceived value and behavioral intention with mediator of customer satisfaction (Table 6.20). Measurement model for Customer perceived value confirms an acceptable model fit of data with  $\chi^2/df=2.557$ , AGFI=0.945, CFI=0.981, GFI = 0.966, NFI=0.970, and RMSEA=0.055. Thus, this structural model is fits well.

**Table 6.23: Standardized path coefficients between Customer Perceived Value, customer satisfaction and Behavioral Intention**

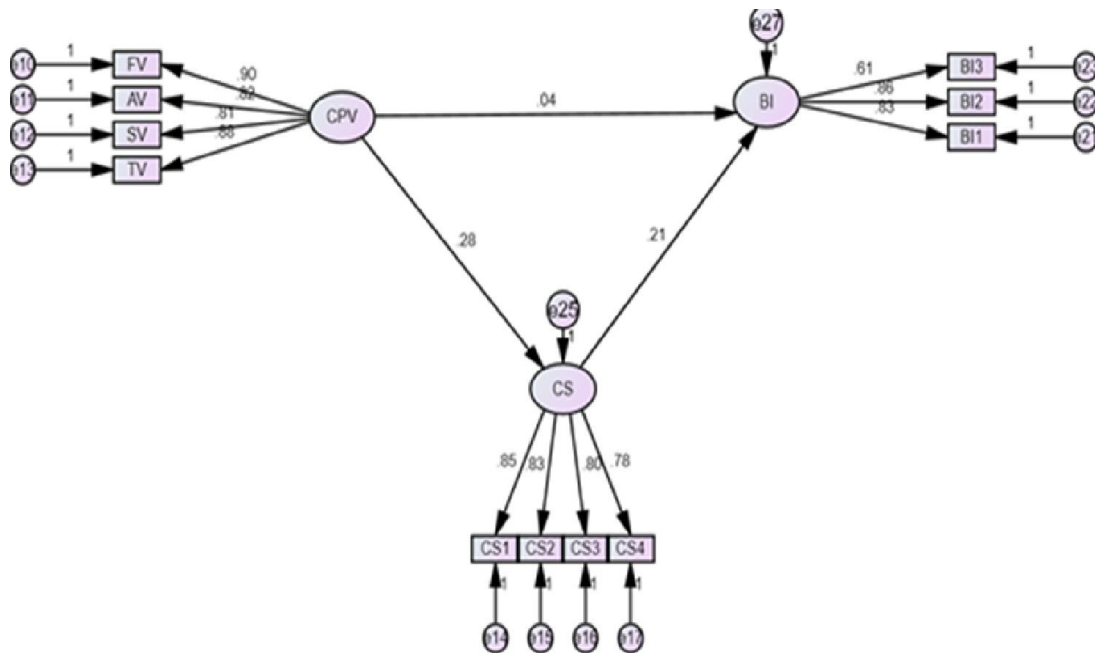
Predicted Relationship	Standardized path loadings	T-value	p-value
CPV→CS	0.288	6.442	***
CPV→BI	0.041	3.819	***
CS→BI	0.214	6.051	***

The hypothesized positive relationship between customer perceived value and customer satisfaction was supported with standardized path loading of CPV→CS was 0.288; t-value- 6.442 statistically significant at p<0.001. Hypothesized positive relationship between customer perceived value and behavioral intention was supported with standardized path loading of CPV→BI was 0.041; t-value- 3.819 statistically significant at p<0.001. Hypothesized positive relationship between customer satisfaction and behavioral intention was supported with standardized path loading of CS→BI was 0.214; t-value- 6.051 statistically significant at p<0.001.

**Table 6.24: Direct, Indirect and total effects of Customer Perceived Value on customer satisfaction and Behavioral Intention**

Predicted Relationship	Direct Effect	Indirect Effect	Total Effect
CPV→CS	0.288*	----	0.288*
CPV→BI	0.041(N.S)	0.214*	0.255*
CS→BI	0.214*	----	0.214

\*Statistically significant ( $p < 0.001$ )



**Figure 6.9: Mediation model between CPV, CS and BI**

**Customer satisfaction acts as a mediator in service constructs in private hospitals**

To test the H<sub>11</sub>, H<sub>12</sub>, H<sub>13</sub>, H<sub>14</sub> which states that patient satisfaction mediates the relationship between customer perceived service quality, customer perceived value, customer loyalty and behavioural intentions, SEM analysis was used which is suggested by Baron and Kenny (1986). The three steps analysis in which first step explains that the relationship between independent and mediating variable must be statistically significant in the path. The second step shows that the independent and dependent variable need to be related with each other in these variables path, while in third step which is path of independent and mediating variable. In this step, if the mediator is statistically significant and the independent variable is now no longer significantly different from zero, it shows

complete or full mediation while partial mediation depicts when regression coefficients of independent variables goes down in magnitude but still statistically significant (James & Brett, 1984).

**Table 6.25: Overall Model Direct, Indirect and total effects of CPSQ and CPV on CS, CL and BI**

Predicted Relationship	Direct Effect	Indirect Effect	Total Effect
CPSQ → CS	0.453*	----	0.453*
CPSQ → CL	0.044*	0.114*	0.158*
CPSQ → BI	0.050*	0.238*	0.288*
CPV → CS	0.288*	----	0.288*
CPV → CL	0.028*	0.154*	0.182*
CPV → BI	0.041*	0.214*	0.255*

\*Statistically significant (p<0.001)

**Table 6.26: Mediation role of relationship**

Hypothesis	Relationship	Full Mediation
H <sub>11</sub>	PSQ->CS->CL	✓
H <sub>12</sub>	PSQ->CS->BI	✓
H <sub>13</sub>	CPV->CS->CL	✓
H <sub>14</sub>	CPV->CS->BI	✓

### 6.8.6 Mediation effects of relationship quality

Our study examined the relationship between five quality dimensions from a multidimensional perspective and from the perspective of healthcare services. In response to research question 1, our analysis points to the existence of four distinct dimensions of service loyalty: word-of-mouth, purchase intention, price sensitivity and complaining behaviour. The factor structure was consistent across the different private healthcare setting. Interestingly, this corresponds with the a priori categorisation of customer loyalty items reported by Zeithaml et al. (1996) which is, as we discussed earlier, both conceptually and empirically most appealing. If anything, the results of our study underline the importance of replication studies in the field of services setting (Hubbard & Armstrong, 1994).

## **6.9 Discussions, research findings and managerial implications**

The objective of this study was to investigate the relative importance of CPSQ nine dimensions and four dimensions of CPV with respect to customers' satisfaction, customers' loyalty and behavioural intention. Mediating effect of customers' satisfaction was also tested between all five constructs in private sector hospitals. The results are consistent with the prior studies that CPSQ is positively related with patient loyalty (Wu et al., 2008; Li et al., 2011; Chahal & Mehta, 2013) and patient satisfaction (Raftopoulos, 2005; Badri et al., 2009). Patient satisfaction is positively related with patient loyalty (Elleuch, 2008; Chahal & Kumari, 2010) and patient satisfaction mediates the relationship between HCSQ and patient loyalty (Dagger & Sweeny, 2007; Mpinganjira, 2011).

Our research should be seen as a preliminary attempt at addressing an issue that has important implications for private healthcare services and practice. Any preliminary attempt will involve a number of limitations. However, acknowledgement of these limitations also suggests new directions for further studies. In the first place, conceptual models as well as scales for measuring and managing service quality and value need further development and refinement. Differences in the nature of service setting might require additional dimensions of service quality (Dabholkar et al., 1996). With regards to the complaining behaviour part of the loyalty scale, the incidental nature of service problems may require incident-based measurement (such as the Critical Incident Technique) rather than service attitude-based measurement instruments. Further research should also incorporate multiple measures of the relevant constructs in order to increase the number of items that are used for the individual quality dimensions. Moreover, our study focused on service loyalty and behavioural intentions only and these intentions are an incomplete proxy for actual customer behaviour (Keaveney, 1995). Therefore, further research should also take actual actions of consumers to perceived service quality into account. Next, the empirical relationships between service quality, value, satisfaction, loyalty and behavioural intentions reported in this chapter are tentative in the sense that they are based on cross-sectional data collected at particular period of time. Finally, for the purpose of cross-validation, additional exploration of the five constructs relationship needs to be extended beyond the healthcare settings. Further conceptual and empirical research addressing aforementioned topics may yield a more in-depth insight into the nature of constructs through a deductive approach. Our findings have several managerial implications as well. The results enable managers of healthcare organizations to nuance



the intuitive relationship between all five constructs and have a richer diagnostic value because the constructs are measured at a detailed and specific level. In addition, information on the service quality, value, customer satisfaction link may provide actionable benchmarks that hospitals may use to guide their service policies aimed at securing customer loyalty and positive behavioural intention. Furthermore, our results have specific indications for the different types of service firms research and budget allocations and personnel management decisions relating to the improvement of satisfaction, loyalty and favourable intentions on the basis of service quality and value. The managerial challenge here is to train employees to give individualized attention to each customer and not treat them by the dozen, despite the fact that the service is subject to high degrees of standardisation. With regards to hospitals, word-of-mouth as well as repeat visits are strongly determined by superior quality. Finally, hospital level assessment of the quality-value link provides useful information to stakeholders on the viability of performance in the future. The identification of satisfaction, loyalty and +ve intentions as a multi-dimensional constructs may help healthcare managers in accurate assessment and managing quality.

## **6.10 Conclusion**

This chapter illustrates about the data interpretation of the collected data from the customer who have taken treatment from the Indian non-corporate hospitals. The responses of the respondents were assessed for its reliability and validity before the utilization of analytical tools of measurement. This chapter also demonstrates the significance, usage and broad application of appropriate methods like descriptive statistics, exploratory factor analysis, confirmatory factor analysis, and structural equation modeling to meet the research objectives. Research methods discussed in chapter four are suitable for the current research. These research methods were broadly used based on the proposed objectives in chapter one to validate the conceptual model fit; as well as the hypothesized issues developed during the initiation of this study. There are many more competing research methods are available, hence these above mentioned methods are found to be reasonably good because they have already been tested in similar studies in developed country context as well as other fields of research. The validation and inferences of the hypotheses were documented throughout the research. This chapter is very important for this thesis as it validates the proposed model and has significant impact on the dependent variables such as satisfaction, loyalty and behavioral intention.

## **CHAPTER 7**

# **Prioritizing Customer Perceived Service Quality & Perceived Value Dimensions**

### **7.1 Introduction**

The main objective of this chapter is to explore and conceptualize different perceived service quality dimensions, which influences customer satisfaction. A questionnaire consisting of 39 items for customer perceived service quality and 14 items for customer perceived value was developed to measure and prioritise the constructs and its items. Data was gathered from 526 customers from a structured questionnaire (Appendix) on a five point rating (Likert scale) was administered through simple random sampling method. Through this research study, an attempt is made to find out the priorities dimensions of service quality such as reliability and responsiveness, physical environment, empathy, efficiency, timeliness, transparency, affordability, communication and consistency for service quality and functional value, acquisition value, social value and transaction value on service receivers, i.e., customers. For analysis of data prioritisation statistical tool i.e., RIDIT analysis has been used. Results of the research might be useful to service providers and healthcare managers for better service performance to the customer and maintain long term sustainability in the competitive environment in private healthcare sector.

### **7.2 Survey Instrument**

The research questionnaire was comprised of two parts; the first part consists to the socio-demographic item of the customers. The second part of questionnaire consists of customer perceived service quality questionnaire which are suitable to Indian private hospitals of different service quality dimensions that relate to private hospitals. The questionnaire includes 39 and 14 items for service quality and value dimensions respectively. The perceived service quality questionnaire has been translated from English to Odiya and Telugu. It is the primary language of the state and then the data was collected. Each scale item comprised five opinions that ranged from a score to 5 for “strongly agree”, 4 for “agree”, 3 for “neither disagree nor agree”, 2 for “disagree”, and 1 for “strongly disagree”. The questionnaire was pretested to ensure the wording, sequencing of questions, length of

question and whether the range of scale was appropriate or not. Then with the help of RIDIT analysis whole data was analyzed to find out the rankings of the factor of concern.

### **7.3 RIDIT Analysis for perceived service quality dimensions**

RIDIT analysis is a “distribution free” technique that it makes no assumption about the distribution of the population under study (Fleiss et al. 2003). RIDIT is a weight assigned to a response category that reflects the probability of that category appearing in the reference distributions. RIDIT is a statistical technique deliberate to assist in the analysis of sample involving various items that are more than dichotomous classifications and are disciplined, but that do not attain the principles of advanced measurement systems such as those meet the criteria for equality-interval or ratio scales (Panda & Sreekumar, 2012). It is particularly useful form of mathematical analysis for items related ratings on a three or more point scale, indices made up of a number of variables and ratings based on global ratings (Beder & Heim, 1990). The RIDIT is a number assigned to a particular category of the variable that is equal to the proportion of in the reference class who have a lower score on that variable, plus one-half of the proportion of individuals in the category itself. Then RIDIT is a weight assigned to a response category that reflects the probability of that category appearing in the reference distributions. RIDIT has a range that approaches the limits of zero and one at two sides. Once the RIDIT values for each category of the dependent variable have been computed, then the individual scores of RIDIT values transformed into dependent variable. Then we compute an average RIDIT value for a class rather than the proportion of respondents giving each of the responses in the dependent variable. Suppose there are  $m$  items and  $n$  ordered categories listed from the most favoured to the least favoured in the scale. The detail calculation of the method is elaborated in the chapter 4.

We have used RIDIT analysis to first prioritize the total service quality dimensions which are bifurcated into nine constructs. Reliability and responsiveness construct with six dimensions, physical environment with six dimensions, empathy with four dimensions, efficiency with four dimensions, timeliness with four dimensions, transparency with four dimensions, affordability with four dimensions, communication with four dimensions and finally consistency with three dimensions. We have collected 526 valid responses ranging in a scale on agreeableness distributed normally. The following table 7.1 represents the RIDITs of the reference data for the customer perceived service quality dimensions.

**Table 7.1: RIDITs for the reference data set for perceived service quality items**

Variables	5	4	3	2	1	$\pi_i$
R&R1	110	155	69	100	92	526
R&R2	169	199	38	78	42	526
R&R3	117	150	64	100	95	526
R&R4	112	209	61	99	45	526
R&R5	121	199	71	94	41	526
R&R6	167	197	45	56	61	526
PE1	106	198	65	122	35	526
PE2	87	236	71	108	24	526
PE3	114	184	88	112	28	526
PE4	114	192	79	121	20	526
PE5	97	160	116	128	25	526
PE6	81	231	106	91	17	526
EM1	158	227	64	61	16	526
EM2	132	223	67	83	21	526
EM3	130	197	76	100	23	526
EM4	170	202	57	82	15	526
EFF1	122	294	78	28	4	526
EFF2	167	269	57	24	9	526
EFF3	203	241	59	21	2	526
EFF4	198	258	50	17	3	526
TML1	205	289	12	16	4	526
TML2	129	298	53	38	8	526
TML3	186	285	34	15	6	526
TML4	188	261	54	18	5	526
TRP1	106	231	126	63	0	526
TRP2	105	211	152	58	0	526
TRP3	113	217	133	63	0	526
TRP4	236	181	84	25	0	526
AFF1	270	185	66	5	0	526
AFF2	173	233	93	27	0	526
AFF3	249	190	62	25	0	526
AFF4	153	233	56	35	49	526
COM1	140	229	74	39	44	526
COM2	179	226	46	34	41	526
COM3	126	258	68	34	40	526
COM4	157	313	23	26	7	526
CON1	236	240	28	20	2	526
CON2	160	292	41	30	3	526
CON3	208	244	31	40	3	526
Fj	5994	8837	2617	2236	830	20514
1/2 fj	2997	4418.5	1308.5	1118	415	
Fj	2997	10412.5	16139.5	18566	20099	
Rj	0.146095	0.507580189	0.786755387	0.90504	0.97977	

Customer perceived service quality in private healthcare service data is chosen as the reference data set. The frequencies of the responses are shown in the above table 7.1. Last row of reference data set on the table shows the RIDITs of the reference data set for each item category. From the RIDIT ranking analysis as shown in table 7.2 it was found that out of all the perceived service quality dimensions of affordability dimension items i.e., hospital provides affordable quality care to their patients is the highest priority items out of all service quality items; the second highest priority rank was of hospital's ability to provide good service at a reasonable price without compromising on quality that appears in the same construct. In line with the affordability construct the third priority preference item is the hospital's consistency in charging fees only for treatment and medicine (no tips for nurses/cleaning staff). The results of RIDIT priority index shows that affordability is most important and significant construct in the Indian private healthcare sector as far as service quality is concerned. Lowest priority ranking in the perceived service quality dimension was commitment item with doctors/staff are always prepared for round the clock services, it shows that doctors/staff are not ready with round the clock services. The commitment of the doctors and staff are very less compared to other quality dimension or items. The brief ranking of the PSQ dimensions is shown in table 7.2.

**Table 7.2: RIDITs for the comparison data sets and prioritisation for customer perceived service quality items**

Variables	5	4	3	2	1	$\rho_i$	Lower Bound	Upper Bound	Priority Ranking
R&R1	0.0306	0.1496	0.1032	0.1721	0.1714	0.6268	0.6227	0.6308	39
R&R2	0.0469	0.1920	0.0568	0.1342	0.0782	0.5082	0.5042	0.5123	21
R&R3	0.0325	0.1447	0.0957	0.1721	0.1770	0.6220	0.6180	0.6260	38
R&R4	0.0311	0.2017	0.0912	0.1703	0.0838	0.5782	0.5742	0.5822	31
R&R5	0.0336	0.1920	0.1062	0.1617	0.0764	0.5699	0.5659	0.5740	30
R&R6	0.0464	0.1901	0.0673	0.0964	0.1136	0.5138	0.5097	0.5178	22
PE1	0.0294	0.1911	0.0972	0.2099	0.0652	0.5928	0.5888	0.5969	36
PE2	0.0242	0.2277	0.1062	0.1858	0.0447	0.5886	0.5846	0.5927	34
PE3	0.0317	0.1776	0.1316	0.1927	0.0522	0.5857	0.5817	0.5897	33
PE4	0.0317	0.1853	0.1182	0.2082	0.0373	0.5805	0.5765	0.5846	32
PE5	0.0269	0.1544	0.1735	0.2202	0.0466	0.6216	0.6176	0.6257	37
PE6	0.0225	0.2229	0.1585	0.1566	0.0317	0.5922	0.5882	0.5962	35
EM1	0.0439	0.2191	0.0957	0.1050	0.0298	0.4934	0.4894	0.4975	18
EM2	0.0367	0.2152	0.1002	0.1428	0.0391	0.5340	0.5300	0.5380	25
EM3	0.0361	0.1901	0.1137	0.1721	0.0428	0.5548	0.5508	0.5588	28

EM4	0.0472	0.1949	0.0853	0.1411	0.0279	0.4964	0.4924	0.5005	19
EFF1	0.0339	0.2837	0.1167	0.0482	0.0075	0.4899	0.4859	0.4939	17
EFF2	0.0464	0.2596	0.0853	0.0413	0.0168	0.4493	0.4452	0.4533	13
EFF3	0.0564	0.2326	0.0882	0.0361	0.0037	0.4170	0.4130	0.4211	9
EFF4	0.0550	0.2490	0.0748	0.0293	0.0056	0.4136	0.4096	0.4176	6
TML1	0.0569	0.2789	0.0179	0.0275	0.0075	0.3887	0.3847	0.3928	4
TML2	0.0358	0.2876	0.0793	0.0654	0.0149	0.4830	0.4789	0.4870	16
TML3	0.0517	0.2750	0.0509	0.0258	0.0112	0.4145	0.4105	0.4186	8
TML4	0.0522	0.2519	0.0808	0.0310	0.0093	0.4251	0.4211	0.4292	10
TRP1	0.0294	0.2229	0.1885	0.1084	0.0000	0.5492	0.5452	0.5532	27
TRP2	0.0292	0.2036	0.2274	0.0998	0.0000	0.5599	0.5559	0.5640	29
TRP3	0.0314	0.2094	0.1989	0.1084	0.0000	0.5481	0.5441	0.5521	26
TRP4	0.0655	0.1747	0.1256	0.0430	0.0000	0.4089	0.4048	0.4129	5
AFF1	0.0750	0.1785	0.0987	0.0086	0.0000	0.3608	0.3568	0.3649	1
AFF2	0.0481	0.2248	0.1391	0.0465	0.0000	0.4585	0.4544	0.4625	14
AFF3	0.0692	0.1833	0.0927	0.0430	0.0000	0.3883	0.3842	0.3923	3
AFF4	0.0425	0.2248	0.0838	0.0602	0.0913	0.5026	0.4986	0.5066	20
COM1	0.0389	0.2210	0.1107	0.0671	0.0820	0.5196	0.5156	0.5236	24
COM2	0.0497	0.2181	0.0688	0.0585	0.0764	0.4715	0.4674	0.4755	15
COM3	0.0350	0.2490	0.1017	0.0585	0.0745	0.5187	0.5146	0.5227	23
COM4	0.0436	0.3020	0.0344	0.0447	0.0130	0.4378	0.4338	0.4419	11
CON1	0.0655	0.2316	0.0419	0.0344	0.0037	0.3772	0.3731	0.3812	2
CON2	0.0444	0.2818	0.0613	0.0516	0.0056	0.4447	0.4407	0.4488	12
CON3	0.0578	0.2355	0.0464	0.0688	0.0056	0.4140	0.4100	0.4180	7

The Kruskal-Wallis (W) for customer perceived service quality items is calculated as follows

$$12 \times \{526 \times (0.6268 - 0.5)^2 + 526 \times (0.5082 - 0.5)^2 + 526 \times (0.6220 - 0.5)^2 + 526 \times (0.5782 - 0.5)^2 + 526 \times (0.5699 - 0.5)^2 + 526 \times (0.5138 - 0.5)^2 + 526 \times (0.5928 - 0.5)^2 + 526 \times (0.5886 - 0.5)^2 + 526 \times (0.5857 - 0.5)^2 + 526 \times (0.5805 - 0.5)^2 + 526 \times (0.6216 - 0.5)^2 + 526 \times (0.5922 - 0.5)^2 + 526 \times (0.4934 - 0.5)^2 + 526 \times (0.5340 - 0.5)^2 + 526 \times (0.5548 - 0.5)^2 + 526 \times (0.4964 - 0.5)^2 + 526 \times (0.4899 - 0.5)^2 + 526 \times (0.4493 - 0.5)^2 + 526 \times (0.4170 - 0.5)^2 + 526 \times (0.4136 - 0.5)^2 + 526 \times (0.3887 - 0.5)^2 + 526 \times (0.4830 - 0.5)^2 + 526 \times (0.4145 - 0.5)^2 + 526 \times (0.4251 - 0.5)^2 + 526 \times (0.5492 - 0.5)^2 + 526 \times (0.5599 - 0.5)^2 + 526 \times (0.5481 - 0.5)^2 + 526 \times (0.4089 - 0.5)^2 + 526 \times (0.3608 - 0.5)^2 + 526 \times (0.4585 - 0.5)^2 + 526 \times (0.3883 - 0.5)^2 + 526 \times (0.5026 - 0.5)^2 + 526 \times (0.5196 - 0.5)^2 + 526 \times (0.4715 - 0.5)^2 + 526 \times (0.5187 - 0.5)^2 + 526 \times (0.4378 - 0.5)^2 + 526 \times (0.3772 - 0.5)^2 + 526 \times (0.4447 - 0.5)^2 + 526 \times (0.4140 - 0.5)^2\} = 1623.185$$

Since the Kruskal-Wallis  $W$  (1623.185) is significantly greater than  $\chi^2$  (39-1) = 47.39, it can be inferred that the opinions about the scale items among the respondents are statistically different somehow.

#### **7.4 Grey Relation analysis for perceived service quality dimensions**

Grey relation analysis was first developed by Deng (1982) according to whom the systems which lack information, such as structure message, operation mechanism and behavior document, are referred to as Grey Systems, such important areas like human body, agriculture, economy etc. It is designed to study uncertainty and can handle incomplete information and unclear problems very precisely. The validity of traditional statistical analysis techniques is based on assumption such as the distribution of population and variations of samples. The term “Grey” stands for poor, incomplete and uncertain, and is especially used in relation to the concept of information (Huang, 2010). Grey Relational Analysis (GRA), which is a part of Grey Theory, is a kind of method by which the relational degree of every factor in the system can be analyzed (Meng & Kees, 2007). GRA indicates the relational degree between two measurement sequences by using the discrete measurement method to measure the distances (Huang, 2010). GRA is used to build a ranking and suggest a best choice on a set of alternatives (Debata et al, 2010). It uses information from the Grey system to dynamically compare influence factors quantitatively and it is based on the level of similarity and variability among all factors to establish their relation. A Grade Relation Grade is obtained to evaluate the multiple performance characteristics (Kuang, 2008).

In order to ascertain the RIDIT ranking and make a conclusive opinion about the priority that customers put on the various dimensions, we have used Grey relation analysis. Both perceived service quality and perceived service value dimensions distributed through 526 samples were subjected to the test and necessary conclusions are drawn. All the 39 perceived service quality dimensions were analyzed so to find their relative standing with respect to each other. Table 7.3 to 7.6 shows the calculation of the Grey score and rank and table 7.7 depicts the relative ranking of RIDIT and Grey score of the service quality dimensions in Indian private healthcare setting.

Table 7.3: Customer perceived service quality data set (526 samples)

Sam	1	2	3	4	5	6	7	8	9	10	11	12	13	14	-	-	21	22	23	24	-	-	28	29	30	31	-	-	37	38	39
S <sub>1</sub>	1	2	1	4	2	1	5	5	4	5	4	2	4	3	-	-	4	3	4	4	-	-	5	5	3	5	-	-	5	4	4
S <sub>2</sub>	1	4	1	2	4	2	4	4	4	4	4	4	5	4	-	-	4	4	4	4	-	-	5	5	5	5	-	-	5	5	5
S <sub>3</sub>	3	2	2	2	3	3	2	3	4	4	3	3	4	4	-	-	5	4	5	4	-	-	5	5	4	5	-	-	3	4	4
S <sub>4</sub>	3	2	2	2	3	3	2	3	4	4	3	3	4	4	-	-	5	4	5	4	-	-	2	2	3	2	-	-	4	4	4
S <sub>5</sub>	2	2	2	2	4	4	4	4	4	2	2	2	4	4	-	-	4	4	4	4	-	-	5	5	4	5	-	-	5	4	4
S <sub>6</sub>	2	2	2	2	2	2	2	2	2	2	2	2	2	2	-	-	4	2	4	4	-	-	4	3	3	4	-	-	4	4	4
S <sub>7</sub>	5	5	4	5	5	5	5	5	4	4	4	5	3	3	-	-	4	5	4	4	-	-	3	3	4	3	-	-	4	4	4
S <sub>8</sub>	2	2	2	2	2	4	2	2	2	2	2	4	4	4	-	-	4	4	5	4	-	-	5	5	5	5	-	-	4	4	4
S <sub>9</sub>	2	2	2	4	4	2	4	2	2	2	2	4	4	4	-	-	4	4	4	4	-	-	4	3	3	4	-	-	4	4	5
S <sub>10</sub>	2	2	2	2	2	4	2	2	2	2	2	4	2	2	-	-	4	4	4	4	-	-	3	5	4	5	-	-	4	4	4
S <sub>11</sub>	4	4	4	4	5	5	4	4	4	4	4	4	4	4	-	-	4	4	4	4	-	-	5	5	5	5	-	-	4	4	4
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>195</sub>	2	2	2	2	2	4	2	2	2	2	2	2	5	4	-	-	4	4	4	4	-	-	5	5	5	5	-	-	4	4	5
S <sub>196</sub>	4	5	4	4	4	4	4	4	4	2	2	2	5	5	-	-	4	4	5	5	-	-	4	3	4	4	-	-	4	5	2
S <sub>197</sub>	4	5	5	4	4	5	4	4	4	4	4	4	4	4	-	-	4	4	4	4	-	-	3	4	3	3	-	-	4	4	5
S <sub>198</sub>	4	4	4	5	4	5	4	4	4	5	5	4	4	5	-	-	4	4	5	4	-	-	2	3	2	2	-	-	5	4	5
S <sub>199</sub>	4	2	2	4	4	4	4	4	4	2	1	4	4	4	-	-	4	4	4	4	-	-	3	4	4	3	-	-	4	4	4
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>521</sub>	1	4	1	2	2	1	4	4	4	5	5	4	4	2	-	-	5	5	4	4	-	-	5	4	5	5	-	-	2	2	2
S <sub>522</sub>	4	4	4	4	4	4	4	4	4	3	3	4	4	3	-	-	4	4	4	4	-	-	5	5	5	5	-	-	3	4	4
S <sub>523</sub>	4	4	4	4	4	4	4	4	3	4	4	4	4	4	-	-	5	3	5	4	-	-	5	5	3	5	-	-	5	5	5
S <sub>524</sub>	3	4	5	4	4	4	5	5	5	5	5	4	3	4	-	-	5	4	5	5	-	-	5	5	4	5	-	-	5	5	5
S <sub>525</sub>	4	5	4	4	2	2	2	4	3	3	2	3	5	4	-	-	5	5	5	4	-	-	5	5	4	5	-	-	4	5	3
S <sub>526</sub>	4	4	4	4	4	4	4	4	4	4	3	4	4	4	-	-	4	4	4	4	-	-	4	4	2	4	-	-	5	4	4



**Table 7.4: Difference data series of customer perceived service quality**

$\Delta_1$	$\Delta_2$	$\Delta_v$	$\Delta_v$	$\Delta_7$	$\Delta_8$	-	-	$\Delta_{14}$	$\Delta_{15}$	-	-	$\Delta_{25}$	$\Delta_{26}$	$\Delta_{27}$	-	-	$\Delta_{33}$	$\Delta_{34}$	$\Delta_{35}$	$\Delta_{36}$	$\Delta_{37}$	$\Delta_{38}$	$\Delta_{39}$
4	3	-	-	0	0	-	-	2	3	-	-	0	0	0	-	-	0	0	0	0	0	1	1
4	1	-	-	1	1	-	-	1	3	-	-	0	1	1	-	-	1	1	1	0	0	0	0
2	3	-	-	3	2	-	-	1	1	-	-	0	2	2	-	-	1	1	1	1	2	1	1
2	3	-	-	3	2	-	-	1	1	-	-	3	2	2	-	-	1	1	1	1	1	1	1
3	3	-	-	3	3	-	-	3	3	-	-	2	0	3	-	-	1	0	1	1	1	1	1
0	0	-	-	0	0	-	-	2	2	-	-	3	2	2	-	-	1	1	0	1	1	1	1
3	3	-	-	3	3	-	-	1	3	-	-	1	2	1	-	-	0	0	0	1	1	1	1
3	3	-	-	1	3	-	-	1	1	-	-	3	3	2	-	-	1	0	1	1	1	1	0
3	1	-	-	3	2	-	-	2	2	-	-	1	1	0	-	-	0	1	1	1	1	1	1
2	0	-	-	1	1	-	-	2	2	-	-	1	0	1	-	-	1	0	0	1	1	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	1	-	-	1	1	-	-	3	3	-	-	0	2	2	-	-	1	0	0	0	0	0	0
3	4	-	-	3	3	-	-	3	3	-	-	3	2	2	-	-	4	0	0	3	3	3	3
1	0	-	-	0	1	-	-	0	1	-	-	3	2	1	-	-	3	0	1	1	0	1	3
1	0	-	-	0	0	-	-	2	1	-	-	2	0	3	-	-	1	1	1	0	0	0	1
1	1	-	-	1	1	-	-	0	0	-	-	3	2	2	-	-	1	0	1	1	1	1	1
3	4	-	-	3	1	-	-	1	1	-	-	1	2	1	-	-	1	1	1	1	1	1	1
1	2	-	-	3	1	-	-	1	0	-	-	3	3	2	-	-	1	1	2	1	1	1	1
1	3	-	-	3	3	-	-	1	1	-	-	2	2	1	-	-	2	2	2	3	4	4	3
2	1	-	-	2	3	-	-	3	3	-	-	2	2	2	-	-	1	2	3	2	2	3	1
1	1	-	-	1	1	-	-	2	1	-	-	2	3	3	-	-	1	1	1	1	2	1	1
1	1	-	-	1	1	-	-	1	1	-	-	2	1	3	-	-	2	2	2	0	0	0	0
2	1	-	-	0	0	-	-	1	1	-	-	0	0	0	-	-	1	4	1	0	0	0	0
1	0	-	-	3	1	-	-	1	3	-	-	3	3	3	-	-	3	0	1	0	1	0	2
1	1	-	-	1	1	-	-	1	1	-	-	2	1	1	-	-	1	1	1	0	0	1	1

**Table 7.5: Grey Relational Grade for customer perceived service quality**

Y1	Y2	Y3	Y4	Y5	Y6	-	-	Y1	Y1	Y1	Y1	Y1	-	-	Y36	Y37	Y38	Y39
0.33	0.40	0.33	0.67	0.40	0.33	-	-	1.00	0.50	0.67	0.67	1.00	-	-	1.00	1.00	1.00	1.00
0.33	0.67	0.33	0.40	0.67	0.40	-	-	0.67	0.67	0.67	0.67	1.00	-	-	0.60	0.60	1.00	1.00
0.67	1.00	1.00	0.67	0.50	0.67	-	-	0.50	0.50	0.67	0.50	0.60	-	-	0.60	0.60	0.43	1.00
0.67	0.67	0.40	0.67	0.67	0.67	-	-	0.67	1.00	1.00	1.00	0.60	-	-	0.60	1.00	1.00	1.00
0.67	0.67	0.50	0.67	0.40	0.67	-	-	0.67	1.00	1.00	1.00	0.60	-	-	1.00	0.60	1.00	1.00
0.40	0.40	0.40	0.40	0.50	0.50	-	-	0.50	0.67	0.67	0.50	0.60	-	-	0.60	0.60	0.60	1.00
0.40	0.40	0.40	0.40	0.67	0.67	-	-	0.67	1.00	0.67	1.00	0.60	-	-	1.00	1.00	1.00	1.00
0.67	0.50	1.00	0.67	0.67	0.67	-	-	1.00	0.67	0.67	1.00	1.00	-	-	0.60	0.60	1.00	1.00
1.00	0.67	1.00	1.00	1.00	0.67	-	-	1.00	0.67	0.67	1.00	0.60	-	-	0.60	0.60	0.43	1.00
0.67	0.67	1.00	0.67	0.67	0.67	-	-	1.00	1.00	1.00	1.00	0.60	-	-	0.60	0.60	1.00	1.00
0.33	0.40	0.40	0.33	0.67	0.67	-	-	0.67	0.67	0.67	0.67	0.60	-	-	1.00	0.60	1.00	1.00
0.67	0.67	0.40	0.67	0.67	0.67	-	-	0.67	0.67	0.67	0.50	0.67	-	-	0.67	0.43	0.67	0.67
0.67	0.67	0.67	0.67	0.50	0.40	-	-	0.67	0.50	0.67	0.50	0.50	-	-	0.67	0.33	0.67	0.67
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.00	0.67	0.67	1.00	0.67	0.67	-	-	0.67	0.67	0.67	0.67	0.67	-	-	0.67	0.33	1.00	0.67
0.40	0.40	0.40	0.40	0.50	0.67	-	-	0.67	0.67	0.67	0.50	0.67	-	-	0.67	0.33	0.40	0.40
1.00	0.67	0.67	1.00	0.67	0.67	-	-	1.00	1.00	0.67	1.00	1.00	-	-	1.00	0.43	1.00	0.67
0.50	0.40	0.50	0.50	1.00	1.00	-	-	0.67	1.00	1.00	1.00	1.00	-	-	1.00	1.00	0.50	0.40
0.40	0.50	0.40	0.40	1.00	0.67	-	-	0.67	0.67	0.40	0.33	0.40	-	-	0.40	0.33	0.40	0.50
0.67	0.67	0.40	0.67	0.67	0.67	-	-	0.67	0.67	0.67	0.50	0.67	-	-	0.67	0.43	0.67	0.67
0.67	0.67	0.67	0.67	0.50	0.40	-	-	0.67	0.50	0.67	0.50	0.50	-	-	0.67	0.33	0.67	0.67
1.00	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	0.67	1.00	0.67	-	-	1.00	1.00	1.00	1.00
1.00	0.67	0.67	1.00	0.67	0.67	-	-	0.67	0.67	0.67	0.67	0.67	-	-	0.67	0.33	1.00	0.67
0.40	0.40	0.40	0.40	0.50	0.67	-	-	0.67	0.67	0.67	0.50	0.67	-	-	0.67	0.33	0.40	0.40
0.33	0.33	0.40	0.33	0.67	0.67	-	-	0.67	0.67	0.67	0.67	0.67	-	-	0.67	0.60	0.33	0.33

**Table 7.6: Average grade score of Grey relational Analysis perceived service quality**

Variable	Grey grade	Rank	Mean	S.D	Variable	Grey grade	Rank	Mean	S.D
R&R1	0.6049	39	3.17	1.41	TML1	0.7817	4	4.28	0.72
R&R2	0.6951	21	3.71	1.28	TML2	0.7068	16	3.95	0.88
R&R3	0.6091	38	3.18	1.44	TML3	0.7619	8	4.20	0.77
R&R4	0.6390	32	3.46	1.25	TML4	0.7558	9	4.16	0.81
R&R5	0.6466	30	3.50	1.24	TRP1	0.6614	27	3.72	0.92
R&R6	0.6906	22	3.67	1.33	TRP2	0.6554	29	3.69	0.91
PE1	0.6286	35	3.41	1.23	TRP3	0.6639	26	3.72	0.93
PE2	0.6288	34	3.48	1.13	TRP4	0.7768	5	4.19	0.87
PE3	0.6359	33	3.46	1.20	AFF1	0.8142	1	4.37	0.74
PE4	0.6393	31	3.49	1.17	AFF2	0.7329	14	4.05	0.84
PE5	0.6101	37	3.33	1.17	AFF3	0.7918	3	4.26	0.85
PE6	0.6269	36	3.51	1.05	AFF4	0.6966	20	3.77	1.21
EM1	0.7050	17	3.86	1.07	COM1	0.6838	23	3.73	1.18
EM2	0.6731	25	3.69	1.13	COM2	0.7220	15	3.89	1.17
EM3	0.6591	28	3.59	1.18	COM3	0.6806	24	3.75	1.12
EM4	0.7048	18	3.82	1.13	COM4	0.7406	11	4.12	0.80
EFF1	0.7021	19	3.95	0.81	CON1	0.7950	2	4.31	0.77
EFF2	0.7361	13	4.07	0.87	CON2	0.7371	4	4.10	0.81
EFF3	0.7643	7	4.18	0.81	CON3	0.7499	16	4.17	0.89
EFF4	0.7653	6	4.20	0.78					

Using the algorithms furnished in the chapter 4 the GRA scores and the GRA grades were calculated for each of the scale items is presented in table 7.7 along with 39 perceived service quality variables. According to the opinion of 526 private hospital customers who had taken treatment from the different hospitals, affordability is the most important construct as two of its dimensions features in the top four priorities. AFF1 i.e. hospital provides good service at a reasonable cost without compromising on quality with mean score of 4.37 relates to an affordability dimension in private healthcare sector; whereas another important item is consistency of fees and other charges with the mean score of 4.31 in the consistency dimension. The third important item is hospital's admission/discharge process conducted professionally and within a reasonable amount of time with the mean score of 4.28 that comes under the timeliness dimension. The highest scored items relate to the perceived service quality constructs are affordability,

consistency and timeliness. It reveals that the private hospital customers' place high importance to affordability of healthcare services with long term consistency includes timely treatment from the service providers. The descriptive analysis also indicates that the service quality items, hospital/staff provides services as promised; staffs maintain error-free records and hospital medical facilities are convenient to customers doesn't contribute much towards perceived service quality by the private hospital customers.

### **7.5 Comparative ranking of RIDIT and Grey analysis for service quality**

As we wanted to ascertain the RIDIT ranking and make a conclusive opinion about the priority that customers put on the various dimensions, we have used Grey relation analysis. Through Grey analysis we have found a different set of ranking of dimensions as presented in the table above. Customer perceived service quality dimensions distributed through 526 samples were subjected to both the tests and the all the 39 perceived service quality dimensions were analyzed so to find their relative standing with respect to each other. Table 7.7 shows comparative ranking of dimensions with respect to both the tests.

**Table 7.7: GRA and RIDIT Comparative scores and ranking for service quality**

Sr no	CPSQ Variable	GRA Score	GRA rank	RIDIT score	RIDIT rank
1	R&R1	0.6049	39	0.6268	39
2	R&R 2	0.6951	21	0.5082	21
3	R&R 3	0.6091	38	0.6220	38
4	R&R 4	0.6390	32	0.5782	31
5	R&R 5	0.6466	30	0.5699	30
6	R&R6	0.6906	22	0.5138	22
7	PE1	0.6286	35	0.5928	36
8	PE2	0.6288	34	0.5886	34
9	PE3	0.6359	33	0.5857	33
10	PE4	0.6393	31	0.5805	32
11	PE5	0.6101	37	0.6216	37
12	PE6	0.6269	36	0.5922	35
13	EMP1	0.7050	17	0.4934	18
14	EMP2	0.6731	25	0.5340	25
15	EMP3	0.6591	28	0.5548	28
16	EMP4	0.7048	18	0.4964	19
17	EFF1	0.7021	19	0.4899	17
18	EFF2	0.7361	13	0.4493	13
19	EFF3	0.7643	7	0.4170	9
20	EFF4	0.7653	6	0.4136	6
21	TML1	0.7817	4	0.3887	4

22	TML2	0.7068	16	0.4830	16
23	TML3	0.7619	8	0.4145	8
24	TML4	0.7558	9	0.4251	10
25	TRP1	0.6614	27	0.5492	27
26	TRP2	0.6554	29	0.5599	29
27	TRP3	0.6639	26	0.5481	26
28	TRP4	0.7768	5	0.4089	5
29	AFF1	0.8142	1	0.3608	1
30	AFF2	0.7329	14	0.4585	14
31	AFF3	0.7918	3	0.3883	3
32	AFF4	0.6966	20	0.5026	20
33	COM1	0.6838	23	0.5196	24
34	COM2	0.7220	15	0.4715	15
35	COM3	0.6806	24	0.5187	23
36	COM4	0.7406	11	0.4378	11
37	CON1	0.7950	2	0.3772	2
38	CON2	0.7371	12	0.4447	12
39	CON3	0.7499	10	0.4140	7

The findings have been sorted as identified by the respective analysis so as to compare the rankings of the scale items for their degree of importance or agreement from customers' perspective. From the findings, it is observed that there is positive correlation between the methods viz. RIDIT and the Grey Relational Analysis used for prioritizing the perceived service quality variables. It is remarkable to observe from the Table 7.7 that 27 out of 39 variable ranks as assigned by the two techniques are matching and there is no significant difference with the rest of the ranks. Table 7.9 shows that the customers place top importance to the scaled item "hospital provides good service at a reasonable cost without compromising on quality" followed by the scaled items "consistency of fees and other charges" rank two for both methods and "charges for various tests and other medical services are affordable" also the similar rank in both prioritization analysis. The top ranked scaled item encompasses the affordable services offered to the customer by the service providers with consistency in long term. The least prioritized or ranked item is "the hospital/staff provides service as promised" followed by another least rank item "hospital staff maintain error-free records (e.g. medical records, fee receipt)" both least items comes under the reliability and responsiveness dimension. It indicates that Indian customers do not place too much importance to service quality dimensions like reliability and responsiveness. The lowest prioritized items as per the rankings by both tests may offer guidelines to healthcare managers to implement new system in service quality issues.

## 7.6 RIDIT Analysis for perceived value dimensions

We used RIDIT analysis to prioritize the total perceived value dimensions which are bifurcated into four constructs. Functional value construct with four dimensions, Acquisition value with four dimensions, Social value with three dimensions, and finally transaction value with three dimensions. We have collected the same 526 valid responses ranging in a scale on agreeableness distributed normally. From the RIDIT ranking analysis as shown in table 7.4 it was found that out of all the perceived value dimensions the highest priority customers attach to the services received for hospital was value for money which is again a matter of functional value or customers; the second highest priority rank was of hospital's ability to sustainably improving way of services patients receives. The third priority preference item is the hospital's consistency in charging reasonable prices to its customers. The results of RIDIT priority index shows that functional value is most important and significant construct in the Indian private healthcare sector as far as perceived value is concerned. Lowest priority ranking in the perceived value dimension was assigned to acquisition value. The ranking of the PSQ dimensions is shown in table 7.8.

**Table 7.8: RIDITs for the reference data set of customer perceived value items**

Variables	5	4	3	2	1	$\pi_i$
FV1	244	186	69	27	0	526
FV2	267	185	69	5	0	526
FV3	207	211	91	17	0	526
FV4	204	217	93	12	0	526
AV1	88	252	146	40	0	526
AV2	117	237	104	68	0	526
AV3	118	195	147	66	0	526
AV4	90	263	133	40	0	526
SV1	217	281	11	14	3	526
SV2	191	290	28	13	4	526
SV3	140	178	72	108	28	526
TV1	168	218	50	70	20	526
TV2	125	221	78	90	12	526
TV3	204	259	41	18	4	526
Fj	2380	3193	1132	588	71	7364
1/2 fj	1190	1596.5	566	294	35.5	
Fj	1190	3976.5	6139	6999	7328.5	
Rj	0.161597	0.539992	0.83365	0.950435	0.995179	

**Table 7.9: RIDITs for the Comparison data sets and prioritisation for customer perceived value items**

Variables	5	4	3	2	1	$\rho_i$	Lower Bound	Upper Bound	Priority Ranking
FV1	0.07496	0.19095	0.10936	0.04879	0.00000	0.42405	0.41732	0.43078	3
FV2	0.08203	0.18992	0.10936	0.00903	0.00000	0.39034	0.38361	0.39707	1
FV3	0.06359	0.21661	0.14422	0.03072	0.00000	0.45515	0.44842	0.46188	7
FV4	0.06267	0.22277	0.14739	0.02168	0.00000	0.45452	0.44779	0.46125	6
AV1	0.02704	0.25870	0.23139	0.07228	0.00000	0.58941	0.58268	0.59614	14
AV2	0.03594	0.24330	0.16483	0.12287	0.00000	0.56695	0.56022	0.57367	9
AV3	0.03625	0.20019	0.23298	0.11926	0.00000	0.58867	0.58195	0.59540	13
AV4	0.02765	0.27000	0.21079	0.07228	0.00000	0.58071	0.57398	0.58744	11
SV1	0.06667	0.28847	0.01743	0.02530	0.00568	0.40355	0.39682	0.41028	2
SV2	0.05868	0.29771	0.04438	0.02349	0.00757	0.43183	0.42510	0.43856	4
SV3	0.04301	0.18273	0.11411	0.19515	0.05298	0.58798	0.58125	0.59471	12
TV1	0.05161	0.22380	0.07924	0.12648	0.03784	0.51898	0.51225	0.52571	8
TV2	0.03840	0.22688	0.12362	0.16262	0.02270	0.57423	0.56750	0.58096	10
TV3	0.06267	0.26589	0.06498	0.03252	0.00757	0.43363	0.42691	0.44036	5

The Kruskal-Wallis (W) for customer perceived value items is calculated as follows:

$$12 \times \{ 526 \times (0.42405 - 0.5)^2 + 526 \times (0.39034 - 0.5)^2 + 526 \times (0.45515 - 0.5)^2 + 526 \times (0.45452 - 0.5)^2 + 526 \times (0.58941 - 0.5)^2 + 526 \times (0.56695 - 0.5)^2 + 526 \times (0.58867 - 0.5)^2 + 526 \times (0.58071 - 0.5)^2 + 526 \times (0.40355 - 0.5)^2 + 526 \times (0.43183 - 0.5)^2 + 526 \times (0.58798 - 0.5)^2 + 526 \times (0.51898 - 0.5)^2 + 526 \times (0.57423 - 0.5)^2 + 526 \times (0.43363 - 0.5)^2 \} = 509.3239$$

Since the Kruskal-Wallis W (509.3239) is significantly greater than  $\chi^2 (14-1) = 47.39$ , it can be inferred that the opinions about the scale items among the respondents are statistically different somehow.

### 7.7 Grey Relation analysis for perceived value dimensions

As we have prioritized the customer perceived service quality dimension using Grey analysis, same way we explored the customer value dimensions and ranked them. This

will again try to confirm and assure the RIDIT rank that whether both are in sync with each other or not. Table 7.10 to 7.13 shows the calculation of the Grey score and rank and table 7.14 depicts the relative ranking of the service quality dimensions in Indian private healthcare setting.

**Table 7.10: Customer perceived value data set (526 samples)**

<b>Sam</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
S <sub>1</sub>	5	5	4	5	4	4	4	4	4	4	2	4	3	4
S <sub>2</sub>	5	5	5	5	4	4	5	4	4	4	2	5	4	4
S <sub>3</sub>	5	5	5	5	3	2	2	3	5	5	4	4	4	4
S <sub>4</sub>	4	4	4	4	4	5	4	4	5	5	4	4	4	4
S <sub>5</sub>	5	5	2	3	3	4	4	3	4	4	2	4	4	4
S <sub>6</sub>	5	5	5	5	4	5	5	4	4	4	2	2	2	4
S <sub>7</sub>	5	5	5	5	3	5	2	3	4	4	3	3	4	4
S <sub>8</sub>	3	5	5	5	3	4	3	3	4	4	5	5	5	4
S <sub>9</sub>	5	5	5	4	4	5	4	4	5	5	5	5	5	5
S <sub>10</sub>	5	5	5	4	4	4	5	4	5	5	4	5	4	5
S <sub>11</sub>	4	5	5	5	4	2	3	4	4	4	4	5	5	4
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>195</sub>	5	5	5	4	2	3	2	2	5	4	4	4	4	4
S <sub>196</sub>	5	5	4	3	4	4	3	4	4	5	3	5	5	5
S <sub>197</sub>	3	5	5	5	4	2	3	4	4	5	3	3	2	3
S <sub>198</sub>	4	4	3	4	3	3	4	4	4	4	2	1	1	4
S <sub>199</sub>	4	4	4	5	4	4	5	4	3	4	3	3	4	3
S <sub>200</sub>	5	5	4	3	4	4	3	4	4	5	3	5	5	5
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>352</sub>	5	5	5	5	3	2	2	3	4	4	2	4	4	4
S <sub>353</sub>	4	3	2	5	3	5	3	3	4	3	4	4	4	4
S <sub>354</sub>	3	4	4	3	3	5	2	3	4	4	5	5	4	5
S <sub>355</sub>	4	4	3	4	4	3	4	4	2	4	2	1	2	2
S <sub>356</sub>	4	4	4	5	4	4	5	4	5	4	3	2	3	5
S <sub>357</sub>	4	4	4	5	4	3	4	4	4	5	4	5	5	5
S <sub>358</sub>	4	3	4	4	3	4	3	3	5	4	5	4	4	5
S <sub>X</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S <sub>521</sub>	3	4	3	3	3	4	4	3	4	4	4	4	2	4
S <sub>522</sub>	3	4	3	3	3	4	4	3	5	4	5	5	4	5
S <sub>523</sub>	4	4	3	4	4	4	4	4	4	4	4	4	4	4
S <sub>524</sub>	4	4	3	4	4	4	4	4	5	5	5	5	4	5
S <sub>525</sub>	4	4	3	3	2	3	3	2	5	4	4	5	5	5
S <sub>526</sub>	3	4	3	4	4	2	3	4	5	4	4	4	4	5



**Table 7.11: Difference data series of customer perceived service quality**

$\Delta_1$	$\Delta_2$	$\Delta_3$	$\Delta_4$	$\Delta_5$	$\Delta_6$	$\Delta_7$	$\Delta_8$	$\Delta_9$	$\Delta_{10}$	$\Delta_{11}$	$\Delta_{12}$	$\Delta_{13}$	$\Delta_{14}$
0	0	1	0	1	1	1	1	1	1	3	1	2	1
0	0	0	0	1	1	0	1	1	1	3	0	1	1
0	0	0	0	2	3	3	2	0	0	1	1	1	1
1	1	1	1	1	0	1	1	0	0	1	1	1	1
0	0	3	2	2	1	1	2	1	1	3	1	1	1
0	0	0	0	2	1	3	2	1	1	3	3	2	1
1	2	2	2	2	1	1	2	0	0	0	0	0	1
2	2	3	1	1	1	1	1	0	1	3	4	3	1
0	0	1	0	2	1	2	2	0	1	0	1	2	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	2	2	2	2	2	2	3	0	1	0	1	0	0
1	2	2	2	1	2	1	1	0	0	0	1	1	0
2	0	2	1	1	1	1	1	0	1	0	0	0	0
1	1	1	2	1	1	2	1	0	0	0	1	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	2	1	2	1	2	1	1	0	1	1	0	0	0
3	2	2	2	2	2	2	3	0	1	0	1	0	0
1	2	2	2	1	2	1	1	0	0	0	1	1	0
2	0	2	1	1	1	1	1	0	1	0	0	0	0
1	1	1	2	1	1	2	1	0	0	0	1	1	0
1	2	1	1	2	1	2	2	0	1	0	1	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	1	1	2	2	1	2	2	1	0	0	0	0	0
1	1	1	1	1	2	2	1	0	1	1	1	1	1
2	1	2	2	2	1	1	2	1	1	1	1	3	1
2	1	2	2	2	1	1	2	0	1	0	0	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	2	2	1	2	1	1	0	0	2	2	2	1	2
1	1	2	1	1	1	1	1	1	1	1	1	1	1
1	1	2	1	1	1	1	1	0	0	0	0	1	0
1	1	2	2	3	2	2	3	0	1	1	0	0	0
2	1	2	1	1	3	2	1	0	1	1	1	1	0

**Table 7.12: Grey Relational Grade for customer perceived service value**

Y <sub>1</sub>	Y <sub>2</sub>	Y <sub>3</sub>	Y <sub>4</sub>	Y <sub>5</sub>	Y <sub>6</sub>	Y <sub>7</sub>	Y <sub>8</sub>	Y <sub>9</sub>	Y <sub>10</sub>	Y <sub>11</sub>	Y <sub>12</sub>	Y <sub>13</sub>	Y <sub>14</sub>
1.00	1.00	0.67	1.00	0.67	0.67	0.67	0.67	0.67	0.67	0.40	0.67	0.50	0.67
1.00	1.00	1.00	1.00	0.67	0.67	1.00	0.67	0.67	0.67	0.40	1.00	0.67	0.67
1.00	1.00	1.00	1.00	0.50	0.40	0.40	0.50	1.00	1.00	0.67	0.67	0.67	0.67
0.67	0.67	0.67	0.67	0.67	1.00	0.67	0.67	1.00	1.00	0.67	0.67	0.67	0.67
1.00	1.00	0.40	0.50	0.50	0.67	0.67	0.50	0.67	0.67	0.40	0.67	0.67	0.67
1.00	1.00	1.00	1.00	0.67	1.00	1.00	0.67	0.67	0.67	0.40	0.40	0.40	0.67
1.00	1.00	1.00	1.00	0.50	1.00	0.40	0.50	0.67	0.67	0.50	0.50	0.67	0.67
0.40	0.40	0.50	0.67	0.40	0.40	0.50	0.40	0.67	1.00	0.40	0.67	0.67	0.67
1.00	1.00	1.00	1.00	0.50	0.67	0.40	0.50	0.67	0.67	0.67	0.67	0.67	0.67
0.67	0.50	0.50	0.50	0.50	0.67	0.67	0.50	0.67	0.67	0.40	0.40	0.40	0.67
0.50	0.50	0.40	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.40	0.67	0.67	0.67
1.00	1.00	0.67	1.00	0.50	0.67	0.50	0.50	0.67	0.67	0.67	1.00	1.00	0.67
0.67	0.50	1.00	0.67	0.40	0.50	1.00	0.50	0.67	0.67	0.67	0.67	0.67	0.67
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.40	0.40	0.40	0.67
-	-	-	-	-	-	-	-	-	-	-	-	-	-
1.00	1.00	1.00	1.00	0.50	0.50	0.40	0.50	0.67	0.67	1.00	1.00	0.67	0.67
1.00	1.00	1.00	1.00	0.67	1.00	0.50	0.67	0.67	1.00	1.00	0.67	1.00	1.00
1.00	1.00	1.00	1.00	0.50	0.50	0.50	0.50	0.67	0.67	0.40	0.40	0.40	0.67
1.00	1.00	1.00	0.67	0.40	0.50	0.40	0.40	0.67	1.00	1.00	1.00	0.67	1.00
1.00	1.00	0.67	0.50	0.67	0.67	0.50	0.67	0.67	0.67	0.67	0.67	0.67	0.67
0.67	0.67	0.67	0.67	0.67	0.40	0.40	0.67	0.67	1.00	0.67	0.67	0.67	0.67
1.00	1.00	1.00	1.00	0.50	0.40	0.40	0.50	0.67	0.67	0.67	0.67	0.67	0.67
0.67	0.50	0.40	1.00	0.50	1.00	0.50	0.50	0.67	0.67	0.67	0.67	1.00	0.67
0.50	0.67	0.67	0.50	0.50	1.00	0.40	0.50	0.67	0.67	0.40	0.67	0.67	0.67
0.40	0.50	0.67	0.40	0.50	0.40	0.50	0.50	0.67	1.00	0.67	0.67	0.67	1.00
0.50	0.67	1.00	1.00	0.50	1.00	0.50	0.50	0.67	1.00	0.67	1.00	0.67	0.67
0.67	0.67	0.50	0.50	0.67	0.50	0.67	0.67	0.67	0.67	1.00	1.00	0.67	0.67
0.50	1.00	1.00	1.00	0.50	0.67	0.50	0.50	0.67	0.67	1.00	1.00	1.00	0.67
1.00	1.00	1.00	0.67	0.67	1.00	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	0.67	0.67	0.67	1.00	0.67	1.00	1.00	0.67	1.00	0.67	1.00
0.67	1.00	1.00	1.00	0.67	0.40	0.50	0.67	0.67	0.67	0.67	1.00	1.00	0.67
0.50	1.00	1.00	1.00	1.00	0.40	0.50	0.67	0.67	1.00	0.67	0.67	0.67	1.00
0.67	0.67	0.50	0.67	0.67	0.50	0.67	0.67	0.67	0.67	0.50	0.67	0.67	0.50
0.43	0.60	0.43	0.43	0.43	0.60	0.60	0.43	0.60	0.60	0.60	0.60	0.33	0.33
0.43	0.60	0.43	0.43	0.43	0.60	0.60	0.43	1.00	0.60	1.00	1.00	0.60	1.00
0.60	0.60	0.43	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.33
0.60	0.60	0.43	0.60	0.60	0.60	0.60	0.60	1.00	1.00	1.00	1.00	0.60	1.00
0.60	0.60	0.43	0.43	0.33	0.43	0.43	0.33	1.00	0.60	0.60	1.00	1.00	1.00
0.43	0.60	0.43	0.60	0.60	0.33	0.43	0.60	1.00	0.60	0.60	0.60	0.60	1.00
0.60	1.00	1.00	1.00	0.73	0.41	0.52	0.73	0.73	0.73	0.41	0.41	0.41	0.56

**Table 7.13 Average grade score of Grey relational Analysis customer perceived value**

Variable	Grey grade	Rank	Mean	S.D	Variable	Grey grade	Rank	Mean	S.D
FV1	0.7829	3	4.23	0.865	AV4	0.6584	12	3.77	0.821
FV2	0.8088	1	4.36	0.742	SV1	0.7908	2	4.32	0.699
FV3	0.7575	7	4.16	0.820	SV2	0.7682	4	4.24	0.727
FV4	0.7578	6	4.17	0.794	SV3	0.6584	13	3.56	1.230
AV1	0.6531	14	3.74	0.826	TV1	0.7075	8	3.84	1.126
AV2	0.6705	9	3.77	0.940	TV2	0.6658	10	3.68	1.084
AV3	0.6586	11	3.69	0.956	TV3	0.7625	5	4.22	0.790

### 7.8 Comparative ranking of RIDIT and Grey analysis perceived value.

The descriptive statistics shows that the perceived values scaled items FV2 received services from hospital was the value for money with mean score of 4.36 relates to functional value dimension in private healthcare sector; another important value item SV1 is hospital keeps on improving the way of services that patients received with the mean score of 4.32 in the social value dimension. The third important item in the value SV2 is hospital services created a favorable perception of me among other people with the mean score of 4.24 comes under the same dimension i.e., social value. The highest scored items relates to the customer perceived value dimensions are functional value and social value. Result shows that the hospital customers place high importance to value for money and social impression to their received services. The descriptive analysis for customer perceived value also indicates that the service value items SV3 patients/accompanying persons feel relaxed during socializing with other patients during treatment; TV2 i.e., hospital provides post-medical treatment advise and AV3 relates to the hospital meets both high quality and low price requirements doesn't contribute much towards customer perceived value by the private hospital customers. The GRA scores and the GRA grades were calculated for each of the scale items and are presented in Table 7.13 along with fourteen perceived value items consisting with four value dimensions. From the findings, it is observed that there is positive correlation between the methods viz. RIDIT and the Grey Relational Analysis used for prioritizing the perceived value variables. It is remarkable to observe from the Table 7.14 that 11 out of 14 variable ranks as assigned by two techniques are matching and there is no significant difference with rest of the ranks.

**Table 7.14: GRA and RIDIT Comparative scores and ranking for perceived value**

Sr no	CPV Variables	GRA Score	GRA rank	RIDIT score	RIDIT rank
1	FV1	0.7829	3	0.42405	3
2	FV2	0.8088	1	0.39034	1
3	FV3	0.7575	7	0.45515	7
4	FV4	0.7578	6	0.45452	6
5	AV1	0.6531	14	0.58941	14
6	AV2	0.6705	9	0.56695	9
7	AV3	0.6586	11	0.58867	13
8	AV4	0.6584	12	0.58071	11
9	SV1	0.7908	2	0.40355	2
10	SV2	0.7682	4	0.43183	4
11	SV3	0.6584	13	0.58798	12
12	TV1	0.7075	8	0.51898	8
13	TV2	0.6658	10	0.57423	10
14	TV3	0.7625	5	0.43363	5

## 7.9 Conclusion

Service quality is emerging as an important strategic weapon in private healthcare sector and its measurement has become a significant tool to develop competitive advantage. Cut throat competition in Indian private healthcare industry due to its attractiveness has forced the service providers and healthcare managers to differentiate themselves by constantly evaluating the dimensions of perceived service quality. Providing better service quality helps healthcare providers to stay on top of the competition. In our research, we have applied a two mathematical prioritization approach viz. RIDIT and GREY analysis to rank the perceived service quality dimensions and customer perceived value dimensions. The results reveal that there is positive correlation between both the methods. The analysis reveals the positive correlation of 0.999291 between the RIDIT and GREY approach which is significant at  $p=0.05$ . The hypothesis proposing that there is no significant difference between RIDIT ranks and GREY ranks is tested using paired t-test. The test confirms there is no significant difference between the rankings by two methods. This indicates that the variables identified for the purpose to be important in the research are robust in nature.

The results reveal that the customers place top importance to the perceived service quality scaled item AFF1 “hospital provides good service at a reasonable cost without

compromising on quality” comes under the perceived service quality dimension with relates to affordability was prioritized rank one with both methods i.e., RIDIT and Grey. The top rank is followed by the scaled items CON1 is consistency of fees and other charges comes under the consistency dimension was ranked two in both methods. The highest priority ranked scaled item encompasses the handiness services offered to the customer by the healthcare service providers and manager of private setting. The lowest ranked items in RIDIT and GRA ranking 39 scaled item R&R1 is “hospital/staff provides services as promised” followed by the another item ranked 38 in quality dimension R&R3 is “hospital staff maintain error-free records”. The both items are comes under the service quality dimension i.e., reliability and responsiveness the least important items as per the rankings obtained by the two methods correspond to the healthcare managers and service providers may implement in their healthcare setting in quality manner.

The second part of the results relates to the customer perceived value. In this part the value scaled item FV2 “received services from hospital was value for money” comes under the value dimension and it relates to functional value was prioritized rank one with both method i.e., RIDIT and Grey. The top rank is followed by the scaled items SV1 is hospital keeps on improving the way of services that patients received comes under the social value dimension was ranked two in both methods. These two items are the highest value generator to the customers. The lowest ranked items in RIDIT and GRA ranking scaled item AV1 is “after using hospital services patients/accompanying persons are getting worthy for money” followed by the another item ranked second lowest in GRA for value dimension SV3 is “patients/accompanying persons feel relaxed during socializing with other patients during treatment” and in RIDIT analysis the second lowest rank is AV3is hospital meets both high quality and low price requirements. The both items are comes under the different value dimension i.e., social value and acquisition value; the least important items as per the rankings obtained by the two methods correspond to the value related manner.

The present study contributes to the research literature on managing healthcare service quality in general by ranking the perceived service quality and customer perceived value dimension which are highly significant in Indian private healthcare setting. From the results, it is apparent that managers of healthcare organizations in Indian setting should pay attention to selected quality and value dimensions by large if they wish to enhance their customer’s perception of retail service quality. The study might be very helpful to new entrants as well as existing players in private sector.

## Chapter 8

# Conclusion & Implications

### 8.1 Introduction

The present study essentially revolves around the issues of service quality in private healthcare with special reference to perceived service quality of Indian customers. Assessing and managing service quality must be based upon the customers perceptions because they are directly involved in identifying, evaluating and availing the healthcare services. Although healthcare service quality is an important issue, private healthcare sector, particularly non-corporate sector is doing very little and are not working towards offering better service although they are preferred destinations for Indian customers. The outcome of this study may help in gaining insights into the problem and to propose remedial measures. Our study undertakes a questionnaire survey to assess the customer perceived service quality of Indian private healthcare sector. An attempt has been made to propose an instrument for assessing customer perceived service quality.

In Indian healthcare sector different levels of hospitals and several other quality enablers influence customer perceived service quality, value, satisfaction, loyalty and behavioral intentions to a large extent. Therefore, it is imperative to identify and classify all those construct enablers so as to highlight the most important enabler requiring instant service provider/managerial attention. The study also contributes in providing an integrated approach for modeling and managing customer perception to find several perceived service quality, perceived value items and propose an appropriate constructs to manage superior performance in private healthcare setting. These constructs may help to highlight deficiencies and develop suitable strategies to improve the quality in healthcare services. The RIDIT methodology was proposed for prioritizing of perceived service quality and customer perceived value in Indian private healthcare setting with nine dimensions for perceived service quality and four dimensions for customer perceived value. Prioritization helps in better decision making for service providers as well as customers in Indian healthcare sector to identify the best service quality practices that can be adopted to improve the providers' performance.

This study also seeks to demonstrate the conceptualization of customer satisfaction, loyalty and behavioral intention construct. Further, it attempts to examine the effect of service quality dimensions on service loyalty and behavioral intentions of

private healthcare service receivers based on the hypotheses. The validity and reliability of the satisfaction, loyalty and behavioral intention instrument have been established. The study provides some important guidelines on perceived service quality for improving the level of service. Therefore, we have provided a general framework for perceived service quality, customer perceived values as well as satisfaction, loyalty and behavioral intention instrument. In Indian private healthcare context an evaluation methodology such as AHP analysis was used for choosing better service provider; EFA, CFA, SEM and Mediation analysis was used to find and fit the service quality enablers; RIDIT analysis was used to prioritize perceived service quality and customer perceived values items. The following section states the summary of the results obtained in the study.

The study presents an evidence that perceived service quality can be reliably measured with thirty nine items loaded on nine quality constructs as reliability and responsiveness, physical environment, empathy, efficiency, timeliness, transparency, affordability, communication, consistency and commitment for perceived service quality. The research study also evident that customer perceived can be measured with fourteen items with four dimensions named as Functional value, Acquisition value, Social value, and Transaction value. It is to be noted that reliability and responsiveness is found to be most important factor with percentage of variance of 11.202 whereas consistency is the least important factor with percentage of variance of 5.594.

## **8.2 Summary**

Our research work mainly focuses on the process of managing customer perceived service quality in Indian private healthcare sector through customers' perspective. This work mainly intends to direct customers towards choosing hospitals based on nine perceived service quality dimensions through Analytical Hierarchy Process with three different alternatives. This is very important as the Indian private healthcare sector continues to be dynamic in nature which is plagued with constant changes and intervention from both within and outside the organization. The day to day activities of service quality of the hospitals fall heavily on the efficiency of the physicians and staff. Therefore, efforts have been put to develop a systematic assessment of quality dimension, which can lead towards high quality performance excellence. In order to carry out this task smoothly, a balance has been created to accommodate the quality parameters and value parameters of the hospital services framework and theoretical perspectives, which would have relevance for both the practitioners and academicians alike.

This study examined the discrepancies in customer perception of nine service quality dimensions, and found there are statistical differences in the degree of customer satisfaction between positive and negative disconfirmation. The research findings point out that there is a discrepancy in perception of customer across the different private hospitals. The degree of discrepancy of perception in nine service quality dimensions showed significant differences across the private hospitals. This means that when customers have reasonably high expectations, but if the service provider fails to respond to it, results is dissatisfaction.

Furthermore, customer perceived value is significantly related to customer satisfaction, even though customers perceive the discrepancy in service quality dimensions. The research result suggests that customer perceived service value mediates the relationship between perceived service quality and customer satisfaction. This means that customers do not always buy the highest quality service (Olshavsky, 1985), and they also do not always purchase at lowest cost service, either (Onkvist & Shaw, 1987). Therefore, the customer perceived value should be considered as a crucial unifying construct in customer decision-making models (Bolton & Drew, 1988; Dodds et al., 1991; Heskett, et al., 1990; Zeithaml, 1988). Thus, how to increase customer perceived value is critical in order to understand long-term customer satisfaction between customers and organizations (hospitals). Managers may need to emphasize perceived value programs over strategies centralized solely on perceived service quality. The findings show that the impact of perceived service quality on customer perceived value varied according to hospital. Out research finding supports the fact that customer satisfaction is influenced by the attitudes and behavior of employees too. The unique contributions of this thesis in light of above summary and findings are as follows:

An instrument is proposed for choosing better healthcare setting with different alternative service providers and service quality dimensions for Indian healthcare context. The instrument is useful for improving the hospital ranking by customer perception towards quality of care and their overall comparison with alternative hospitals. The instrument has been tested using statistical tool such as AHP analysis with consistency ratio and can be utilized for comparative evaluation of healthcare service quality practices within and/or among other alternative service providers. The relationship amongst the service quality dimensions is established using AHP analysis with pair-wise comparison approach. These quality dimensions influence the customer's decision to avail healthcare services. The customer perceived service quality and customer perceived value constructs



as independent variables and satisfaction, loyalty and behavioral intentions as dependent variables was conceptualized. The reliability and validity of the independent and dependent variables are checked through confirmatory factor analysis (CFA). The relationship between perceived service quality, customer perceived value and satisfaction, loyalty and behavioral intention dimensions are established using structural equation modeling (SEM) and the related hypotheses are tested. The effect of service quality and value on three dependent variables in the private healthcare setting has been verified. The perceived service quality items and customer perceived value items are prioritized through statistical method such as RIDIT analysis for easy recognition of the most and least important items in healthcare setting. This may help the service providers to focus on significant dimensions for continual improvement.

### **8.3 Limitations of the study**

This study has few limitations. First, data were collected from customers from twelve different types of private hospitals in India. . The results and findings of the study cannot be generalized. Although the study utilized a large sample, it would be prudent to apply the findings only in the context of Indian healthcare setting because, customers who received services from private healthcare setting in Indian scenario represent a relatively moderate income group of population. Although reliability and validity tests were satisfactory in the study, the generalizability of research results may be limited because only twelve hospitals were selected for data collection. Though the results see eye to eye with other studies conducted in other countries, future research exercises can examine the satisfaction levels of customers with different quality and value dimensions from different parts of the world. Another limitation concerns is the method of analysis of the study. Structural Equation Modeling (SEM) is an effective method for demonstrating several dependence relationships simultaneously but its correlational nature prevents any definitive conclusions being drawn about the causal relationships among the variables. The findings regarding the causal relationships among perceived service quality, customer perceived values, customer satisfaction, customer loyalty and behavioral intentions in this study are therefore tentative in nature. Future research may look at increasing the sample size or using other methods of sampling to gain more insights into the factors which affect customer satisfaction with respect to healthcare services. Additionally, the researchers may attempt to explore more factors in this regard in order to understand the factors affecting customer satisfaction, customer loyalty and behavioral intention.

## **8.4 Managerial Implications**

Some managerial implications can be drawn from the present research. First, the present research suggests that hospital managers should discover which service quality dimensions lead to lower levels of customer satisfaction through regular customer surveys. Regular assessments can monitor the effects of service quality programs or track whether customer expectations of the service are changing over time. Second, hospital managers may establish levels or standards of service quality offered across the hospital grades. This means that hospital managers need to identify their definition of quality and inform customers of it so that realistic expectations can be formed. Third, corporate hospitals and nursing clinics managers can benchmark non-corporate hospital in nine service quality dimensions. Service providers may use strategic tools such as establishment of customer-oriented culture, and the improvement of organizational service orientation including: service leadership, customer focus, employee empowerment, service training and technology, service failure prevention, service standards communication and total quality management to improve customer satisfaction. Fourth, hospital managers should invest and allocate their resources to frontline service encounter employees. It is also found that customer satisfaction is largely influenced by the service contact employees' attitudes and behavior. The quality of service is found to be a function of employee-customer interactions and accordingly, variations in customer contact employees' performance lead to differences in service quality. The study suggests that service delivery variations that reflect individuals' skills, talents, or other qualities of contact personnel provide a way to differentiate a hospital's services and create a competitive advantage.

Finally, customer perceived value should be an integrating decision-making construct for customers. That is, customers may cognitively integrate their perception of what they "get" and what they must "give" in a service transaction in order to arrive at a decision of whether or not to purchase from a given service provider. Thus, healthcare marketers should provide useful information or modified product to customers so as to motivate them to remain loyal to a specific service provider. In other words, marketers should emphasize the perceived value which customers get for the cost they give while incorporating the unmistakable truth that their front line is the best. This implies that hospital managers need to identify which dimensions of service value influence service quality, and integrate it into marketing strategy development. Especially, the employees can be major sources of building a long-term relationship between hospitals and its

customers. If it is assumed that all hospitals only employ qualified human resources and superior facilities and have access to similar information, then being superior on one or more of nine dimensions of the study could provide the basis for competitive advantage.

Managing customer perceived service quality in healthcare has remained a significant research topic for both practitioners and academicians over the past three decades. Because concepts such as satisfaction, quality, value, loyalty and behavioral intentions are context specific, their definition and measurement has remained an issue of primary importance in healthcare. The present study promotes understanding of customers' behavior and their needs, which can be used for providing quality care in healthcare organizations. Theoretically speaking, the study validates multidimensional scales of measuring customer perceived service quality (Nine dimensions) customer perceived value (four dimensions) customer satisfaction (three dimensions) customer loyalty (three dimensions) and behavioral intentions (three dimensions) which may help healthcare managers to formulate new strategies to retain customers in healthcare setting. The relationship between PSQ, CPV, CS, CL and BI provides new insight to the literature. Extensive focus on these relationships may help in strengthening relationships with patients and accompanying persons, and through delivering high quality and value, service providers may retain their customers and achieve competitive advantage.

### **8.5 Scope for future research**

This study proposed the combined and aligned perception of healthcare service quality as well as a unified approach towards developing quality improvement model which could benefit a lot if further research would be done on it. Concerning perceptions of healthcare service providers and customers, more detailed analysis need to be performed in order to reveal how demographic characteristics and background information of respondents could influence their perceptions of healthcare service quality. The study provides a new and broader perspective for examining the direct relationship between PSQ, CPV, CS, CL and BI measures that provide a roadmap for future researchers. Because the study is theoretically limited to assessing and managing the relationship between dimensions, the relationships need to be extended to include safety, hospital image and trust on the service provider from both customers and employees' perspectives to establish a sound theoretical framework. Future research that replicates the study in different cultural contexts is necessary before the findings of this study can be generalized. Moreover, research in different service industries should also be examined to generalize the relationship between consumer value and customer loyalty with identified dimensions.

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## Appendix

# Questionnaire

Dear Sir/Madam

You are requested to kindly fill up the questionnaire without leaving a single question unanswered. The survey is a part of Ph.D. research project titled “Managing customer perceived service quality in private healthcare sector in India”. We assure you that information provided by you will be used only for research purpose. Your participation will be highly encouraging in successful completion of the research work.

Thanks & regards

Rama Koteswara Rao Kondasani  
School of Management, NIT Rourkela

### **PART A: Demographic Information**

(Please fill/tick as applicable)

<b>1.Name:</b>	<b>5.Marital Status:</b>
Place:	Married:
State:	Unmarried:
<b>2.Gender:</b>	<b>6.Treatment Type:</b>
Male:	Inpatient:
Female:	Outpatient:
<b>3.Age:</b>	<b>7.Level of Education:</b>
18-35 30 years:	Primary:
35 -60years:	Secondary:
51-65 years:	Graduation:
Above 65 years:	PG & above:
<b>4.Employment Status:</b>	<b>8.Income per annum:</b>
Unemployed/ Housewives:	Below 1lakh:
Govt employees:	1-3 lakhs:
Private Employees:	3-5 lakhs
Self employed/ Retired:	Above 5 lakhs:

**Optional:** Email address:

Phone number:

## **PART B: AHP Questionnaire**

### **Brief Explanations of Service quality dimensions:**

- **Reliability & Responsiveness (R&R):** Customers expect healthcare service providers to perform the promised service dependably and accurately.
- **Physical Environment (PE):** It includes neatness, physical facilities, infrastructure, hospital functions, medical apparatus, devices and instruments, medical staff appearance and patient room etc.
- **Empathy (EMP):** It refers that ability of the service provider to provide a caring and personalized attention to each customer.
- **Efficiency (EFF):** It refers that healthcare system should be efficient and constantly seeking to reduce the waste, cost of the treatment, better utilisation of healthcare equipment, space, capital, ideas, time and opportunities etc.
- **Timeliness (TML):** Unintended waiting that doesn't provide information or time to heal is a system defect. Prompt attention benefits both the patient and the caregiver should address in time.
- **Transparency (TRP):** Service providers must share information with patients/accompanying persons on the quality of services provided by physicians, hospital staff, patient condition, price of procedures and other healthcare services.
- **Affordability (AFF):** when service costs are premium, and the patient has no insurance programme coverage, when a patient cannot afford to visit a doctor or pay for necessary clinical tests, then there is inadequate access to healthcare.
- **Communication (COM):** it refers the information of all the personnel involved in the delivering service, i.e. physicians, clinical staff and supporting staff etc. communication consist of all the interactions between service providers and customers.
- **Consistency (CON):** it is delighting the patient by providing effective and efficient healthcare services according to the clinical guidelines and standards, which meet the patients needs and satisfies service provider.

### **Comparison scale for AHP preferences**

<b>Verbal Judgment</b>	<b>Numerical ratings</b>
Equally important or Equally preferred	1
Moderately more important or Moderately preferred	3
Strongly more important or Strongly preferred	5
Very strongly more important or Very strongly preferred	7
Extremely more important or Extremely preferred	9
Intermediate values to reflect compromise	2,4,6,8

**Section A: Customer Precedence for SERVQUAL Dimensions**

Dimension	Relative Importance Level	Dimension
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	PE
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	EMP
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	EFF
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TML
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TRP
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	AFF
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	COM
R&R	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON
PE	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	EMP
PE	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	EFF
PE	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TML
PE	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TRP
PE	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	AFF
PE	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	COM
PE	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON
EMP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	EFF
EMP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TML
EMP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TRP
EMP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	AFF
EMP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	COM
EMP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON
EFF	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TML
EFF	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TRP
EFF	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	AFF
EFF	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	COM
EFF	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON
TML	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	TRP
TML	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	AFF
TML	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	COM
TML	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON
TRP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	AFF
TRP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	COM
TRP	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON
AFF	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	COM
AFF	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON
COM	9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9	CON

**Section B: Customer Precedence for private healthcare setting**

Rate the healthcare setting with respect to <b>Reliability &amp; Responsiveness</b>																		
Dimension	Relative Importance Level															Dimension		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Physical Environment</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Empathy</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Efficiency</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Timeliness</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Transparency</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Affordability</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Communication</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
Rate the healthcare setting with respect to <b>Consistency</b>																		
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH
NC	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	CH
CH	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	NCH

## **PART C Questionnaire for Service Quality Enablers**

This questionnaire measures patient perceived service quality in private hospitals. All the questions were scored on a five point likert scale (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree and 1 = Strongly Disagree).

<b>Reliability &amp; Responsiveness (6)</b>					
R&R1	The hospital provides services to the customer as promised.	1	2	3	4 5
R&R2	Doctors & staff are always ready to respond to customers' requests and queries.	1	2	3	4 5
R&R3	Hospital staff maintain error-free records (e.g. medical records, fee receipt)	1	2	3	4 5
R&R4	Hospital personnel gives prompt services to customers	1	2	3	4 5
R&R5	Hospital staff are always willing to help the patients and visitors	1	2	3	4 5
R&R6	The hospital staff are never too busy to respond to customer requests	1	2	3	4 5
<b>Physical Environment (6)</b>					
PE1	Hospital medical facilities are convenient to patients and accompanying persons.	1	2	3	4 5
PE2	The overall cleanliness of the hospital is very good	1	2	3	4 5
PE3	The waiting areas for doctors and medication services are pleasant	1	2	3	4 5
PE4	It is easy to find healthcare facilities and other amenities i.e., lab, doctor's office, pharmacy, cafeteria etc (sign boards available) inside the hospital premises.	1	2	3	4 5
PE5	The hospital provide sufficient and clean washroom and toilets to their customers	1	2	3	4 5
PE6	The hospital is well ventilated and proper lighting system are in place	1	2	3	4 5
<b>Empathy (4)</b>					
EMP1	The employees of the hospital have polite and careful listening attitudes of employees	1	2	3	4 5
EMP2	The hospital personnel have a sense of understanding and friendliness with patients and accompanying persons	1	2	3	4 5
EMP3	Doctors of the hospital spend some time with patients discussing their fears and concerns about health condition	1	2	3	4 5
EMP4	Doctors do their best to make patients feel better	1	2	3	4 5

	emotionally				
<b>Efficiency (4)</b>					
EFF1	Hospital is having competent and experienced doctors and staff members	1	2	3	4 5
EFF2	Hospital personal actively carry out the medical services assigned to them.	1	2	3	4 5
EFF3	Hospital management promptly administers the activities starting from admission to discharge.	1	2	3	4 5
EFF4	Doctors and staff of the hospital do their duty efficiently till the last hours.	1	2	3	4 5
<b>Timeliness (4)</b>					
TML1	Hospital's admission/discharge process conducted professionally within a reasonable amount of time	1	2	3	4 5
TML2	Hospital personnel ensures rapid response to patient's needs in time-based manner	1	2	3	4 5
TML3	Hospital personnel ensures that the treatment starts immediately after the admission	1	2	3	4 5
TML4	Hospital is always ready to provide emergency services in time to the customers.	1	2	3	4 5
<b>Transparency (4)</b>					
TRP1	The payment procedure and billing system of the hospital is quick and transparent.	1	2	3	4 5
TRP2	The process for booking the appointment for consultation and admission is simple and easy.	1	2	3	4 5
TRP3	After the recovery, patients are discharged sooner without extra imposition for staying.	1	2	3	4 5
TRP4	The hospital staffs do not ask for extra money from the customers.	1	2	3	4 5
<b>Affordability (4)</b>					
AFF1	The hospital provides good service at a reasonable cost without compromising on quality	1	2	3	4 5
AFF2	There is no discriminatory pricing stemming out from the status of patients	1	2	3	4 5
AFF3	The charges for various tests and other medical services are affordable to the customers.	1	2	3	4 5
AFF4	The hospital do not charge extra and unreasonable fee from patients and accompanying persons.	1	2	3	4 5
<b>Communication (4)</b>					
COM1	The doctors and staff communicate medical advice in layman's language to patients/accompanying persons for	1	2	3	4 5

	easy understanding.	
COM2	The doctors spend some time with patients discussing their fears and concerns about health condition.	1 2 3 4 5
COM3	The hospital doctors/staff explain procedures and instructions to patients that patients can understand easily.	1 2 3 4 5
COM4	The doctors and service personnel have clear understanding of my illness during this stay in hospital.	1 2 3 4 5

### Consistency (3)

CON1	The hospital maintains consistency of fees and other charges.	1 2 3 4 5
CON2	The emergency/necessary medicine are available throughout the year in hospital store.	1 2 3 4 5
CON3	The doctors and staff are highly committed and consistently provide best services to patients	1 2 3 4 5

### Perceived Value Questions

#### Functional Value

FV1	The doctors always diagnose the medical problem accurately.	1 2 3 4 5
FV2	The support medical staff is well equipped with necessary training.	1 2 3 4 5
FV3	The pathology and technical staff of the hospital remains careful during test and reporting results.	1 2 3 4 5
FV4	The doctors always explain why a particular test is recommended and medicine advised.	1 2 3 4 5

#### Acquisition Value

AV1	By using hospital services patients and accompanying persons get their money's worth.	1 2 3 4 5
AV2	The hospital provides good services for a reasonable price.	1 2 3 4 5
AV3	The hospital meets both high quality and low price requirements.	1 2 3 4 5
AV4	The hospital always provides latest technology adds to customer value.	1 2 3 4 5

#### Social Value

SV1	The behavior and attitude of doctors and medical staff makes you feel relaxed.	1 2 3 4 5
SV2	The hospital services create a favorable perception of me among other people.	1 2 3 4 5
SV3	The patient and accompanying persons feel relaxed	1 2 3 4 5

	during socializing with other patients during treatment				
<b>Transaction Value</b>					
TV1	The patients feel safe in the hands of doctors/ staff of the hospital	1	2	3	4 5
TV2	The hospital provides post hospitalization treatment and advise and it is quite satisfactory	1	2	3	4 5
TV3	The services provided by the hospital gives me psychological satisfaction	1	2	3	4 5
<b>Behavioural Intention</b>					
BI1	I will recommend the Indian private hospital to others who seek my advice.	1	2	3	4 5
BI2	If I feel sick, I will go to the same private hospital where I have taken and experienced treatment.	1	2	3	4 5
BI3	I will encourage my friends and relatives for treatment in the hospitals where I have taken treatment.	1	2	3	4 5
<b>Customer Satisfaction</b>					
CS1	I believe that getting treatment from the Indian private hospitals is usually a very satisfying experience.	1	2	3	4 5
CS2	The overall feelings about the healthcare services in Indian private hospitals are better than I expected.	1	2	3	4 5
CS3	Overall, I am satisfied with the services provided by the Indian private hospitals.	1	2	3	4 5
CS4	I am fully satisfied with my decision to visit this hospital.	1	2	3	4 5
<b>Customer Loyalty</b>					
CL1	I will consider this hospital even if the prices will increase to some extent in future.	1	2	3	4 5
CL2	I will consider this hospital as my first choice to avail health services in future.	1	2	3	4 5
CL3	I will patronize this hospital again if necessary and as long as the present standard of service continues, I would visit this hospital again.	1	2	3	4 5

We have reached the end of the survey.  
Thank you once again for your time and cooperation.



## Dissemination

### International Indexed Journals (Scopus Indexed)

1. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2016), Service Quality Perception and Behavioural Intention: A Study of Indian Private Hospitals, *Journal of Health Management*, 18(1), 188-203.
2. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2015), "Customer Perceived Service Quality, Satisfaction and Loyalty in Indian Private Healthcare", *International Journal of Health Care Quality Assurance*, 28(5), 452-467.
3. Rajeev Kumar Panda and Rama Koteswara Rao Kondasani (2014), Assessing Customers Perceived Service Quality in Private Sector Banks in India, *Serbian Journal of Management*, 9 (1), 91-103.

### International Conferences

1. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2015), Customer Perceived Service Quality, Satisfaction and Customer Loyalty: An Empirical Test of Mediation in Private Hospitals, International Conference on Advances in Healthcare Management Services-2015 (ICAHMS-2015), Organised by IIM Ahmedabad.
2. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2014), Assessing Customer Perceived Service Quality in Indian Private Healthcare: An Integrated Approach, International Conference on Research and Sustainable Business-2014 (ICRSB-2014). Organised by Indian Institute of Technology, Roorkee. ISBN: 978-93-83842-19-3.
3. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2013), Analysing Customers' Perceived Service Quality in Indian Private Healthcare Sector: Patients Perspective. International Conference on Research in Marketing-2013 (ICRM-2013). Organised by Curtin University, Australia; Indian Institute of Technology, Delhi; XLRI, Jamshedpur. ISBN: 978-1-63041-998-1.

### Articles under preparation

1. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2016), Modeling customer perceived service quality, satisfaction and behavioural intentions in Indian private healthcare sector (communicated to *Total Quality Management and Business Excellence*).
2. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2016), Prioritizing customers' perceived service quality dimensions in Indian Private Healthcare Setting using RIDIT Analysis (communicated to *International Journal of Healthcare Quality Assurance*).
3. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2016), Choosing Better Healthcare Setting for Better Service Quality: An Empirical Analysis on Indian Consumers' Perspective (communicated to *Health Services Management Research*).
4. Rama Koteswara Rao Kondasani & Rajeev Kumar Panda, (2016), Customers' Precedence for Service Quality Dimensions in Indian Private Healthcare Setting: A RIDIT Approach (communicated to *Hospital Topics*).

# Curriculum Vitae

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- Master of Business Administration (MBA), Andhra University, India, with first division. Specialization Area: Marketing
- Bachelor of Commerce (B.Sc.) from Acharya Nagarjuna University, India, with first division. Specialization Area: Income Tax and Management Accountancy.
- Higher Secondary (+2) in Arts from Board of Intermediate Education, Andhra Pradesh India with first division. Specialization Area: Commerce, Economics and Civics.
- Matriculation (10<sup>th</sup>) in English, Science, Math from School of Secondary Education, Andhra Pradesh, India with first division.

### **Publications (Journal Papers)**

- Kondasani, R. K. Rao & Panda, Rajeev Ku (2015). Service Quality Perception and Behavioural Intention: A study of Indian Private Hospitals, *Journal of Health Management*, SAGE, 18 (1), 188-203.
- Kondasani, R. K. Rao & Panda, Rajeev Ku (2015). Customer Perceived Service Quality, Satisfaction and Loyalty: A Study in Indian Private Healthcare Sector, *International Journal of Health Care Quality Assurance*, Emerald, 28(5), 452-467.
- Panda, Rajeev Ku & Ram K. Rao Kondasani (2014). Assessing customers' perceived service quality in private sector banks in India, *Serbian Journal of Management*, 9(1): 91-104.

**Computer proficiency:** Operating System (Windows 2007, XP, ME), Application Package [MS -Office (Word, Excel, PowerPoint), SPSS 21, AMOS, LISREL, Latex]

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