EVALUATION OF SERVICE QUALITY MANAGEMENT IN INDIAN HOSPITALS: A STUDY OF SELECT HOSPITALS

A thesis submitted to the University of Hyderabad in partial fulfillment for the award of the degree of

DOCTOR OF PHILOSOPHY
In
MANAGEMENT

By

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DECLARATION

I, RAMAIAH ITUMALLA, hereby declare that the thesis entitled, **"EVALUATION OF SERVICE QUALITY MANAGEMENT IN INDIAN HOSPITALS: A STUDY OF SELECT HOSPITALS"**, submitted by me under the research supervision of **Dr.G.V.R.K ACHARYULU** and **Prof. B. RAJA SHEKHAR** is an original and independent research work. I also declare that, it has not been submitted previously in part or in full to this University or any other University or Institution for the award of any degree or diploma.

Place: Hyderabad RAMAIAH ITUMALLA

Date: Reg. No: 10MBPH01

CERTIFICATE

This is to certify that this thesis entitled, **"EVALUATION OF SERVICE QUALITY MANAGEMENT IN INDIAN HOSPITALS:A STUDY OF SELECT HOSPITALS"**, submitted by RAMAIAH ITUMALLA, Research Scholar enrolled for Ph.D. programme at the School of Management Studies, University of Hyderabad, is a bonafide work as prescribed under Ph.D. ordinances of the University and UGC.

The thesis has not been submitted previously in part or in full to this or any other University or Institution for the award of any degree or diploma.

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ABBREVIATIONS

AGFI	----	Adjusted Goodness of Fit Index
AIIMS	----	All India Institute of Medical Sciences
AMOS	----	Analysis of Moment Structures
ANOVA	----	Analysis of variance
AS	----	Administrative Services
ASSOCHAM	----	Associated Chambers of Commerce and Industry of India
AVE	----	Average Variance Extracted
AYUSH	----	Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy
CAGR	----	Compound Annual Growth Rate
CBM	----	Common Method Bias
CDST	----	Chi-square Difference ($\Delta\chi 2$) Statistic Test
CFA	----	Confirmatory Factor Analysis
CFI	----	Comparative Fit Index
CR	----	Construct Reliability
CR	----	Critical Ratio
CS	----	Customer Satisfaction
df	----	Degrees of Freedom
DME	----	Directorate of Medical Education
EFA	----	Exploratory Factor Analysis
FDI	----	Foreign Direct Investment
GDP	----	Gross Domestic Product
GFI	----	Goodness of Fit Index
GFI	----	Goodness-of-fit Index
GOF	----	Goodness of Fit Index
GOI	----	Government of India
HI	----	Hospital Infrastructure
HospitalQual	----	Model of Hospital Service Quality
IFI	----	Incremental Fit Indices
IPL	----	Inpatient Loyalty

IPSQ	----	In-Patient Service Quality
IPSt	----	In-Patient Satisfaction
JCI	----	Joint Commission International
KMO	----	Kaiser-Meyer-Olkin
MS	----	Medical Service
NABH	----	National Accreditation Board for Hospitals & Health care Providers
NFI	----	Normed Fit Index
NS	----	Nursing Services
PC	----	Patient Communication
PR	----	Parsimony Ratio
PS	----	Patient Safety
PSAS	----	Patient Satisfaction with Administrative Services
PSHI	----	Patient Satisfaction with Hospital Infrastructure;
PSMS	----	Patient Satisfaction with Medical Service
PSNS	----	Patient Satisfaction with Nursing Services
PSPC	----	Patient Satisfaction with Patient Communication
PSPS	----	Patient Satisfaction with Patient Safety
PSSS	----	Patient Satisfaction with Supportive Services
QCI	----	Quality Council of India
R&D	----	Research And Development
RFI	----	Relative Fit Index
RMSEA	----	Route Mean Square Error of Approximation
SEM	----	Structural Equation Modeling
SERVPREF	----	Model of Service Quality Preferences
SERVQUAL	----	Model of Service Quality Gaps
SIC	----	Squared Inter-Construct Correlations
SPSS	----	Statistical Package for Social Sciences
SS	----	Supportive Services
TLI	----	Trucker Lewis Index
UAE	----	United Arab Emirates
UK	----	United Kingdom

US $	----	Dollar of United States
VIF	----	Variance Inflation Factor
VIF	----	Variance Inflation Factor
WHO	----	World Health Organization
$\chi 2$	----	Chi-Square

ABSTRACT

Healthcare has been emerging as one of the fastest growing service sectors in India. The healthcare sector, which consists of hospitals, medical infrastructure, medical devices, clinical trials, outsourcing, telemedicine, health insurance and medical equipment, was valued at US$ 78.6 billion in 2012, and is expected to reach US $158.2 billion by 2017 (IBEF, 2013). The healthcare sector is expected to advance at a Compound Annual Growth Rate (CAGR) of 15 per cent during 2008-17. The hospital segment holds a major share of the healthcare industry and is outpacing the overall industry growth in India.

The concern for service quality reached a unique level in various service sectors including healthcare. The management of service quality needs a different approach when it comes to the services sector.Unlike in the earlier days when hospitals were judged by the medical services they provided, they are now also judged on the quality of service they provide. For the long-run success of a health care organization, both functional and technical quality have to be monitored and managed effectively (Babakus Emin & W Glynn Mangold ,1992). In the competitive hospital environment, there is a need to focus on the management aspects of hospitals has become more relevant than before. Measuring service quality as perceived by patients is one step to improve management of hospitals.

The research objectives of the study are (1) to develop a HospitalQual theoretical model by identifying the variables and factors which measure inpatient service quality in public and private hospitals (2) to test what extent the inpatient service quality factors are predicting the overall service quality in hospitals (3) to validate the identified inpatient service quality variables and factors by developing a HospitalQual measurement model (4) to examine the relationships among inpatient service quality, inpatient satisfaction and inpatient loyalty using structural equation modeling and (5) to compare the inpatient service quality, inpatient satisfaction and inpatient loyalty in public and private hospitals.The present study followed a mixed approach to enable some of the benefits of both qualitative and quantitative research approaches to explore and identify the critical factors to measure inpatient service quality in hospitals from the perspective of patients.

Total 1070 valid sample was collected using non-probability purposive sampling method from six select hospitals located in Hyderabad. The collected data is analyzed using

multivariate data analysis tests with the help of software tools such as MS Excel, Statistical Package for Social Sciences (SPSS-17) and Analysis of Moment Structures (AMOS- 18). Based on psychometric scale development approaches, the study conceptualized, constructed, refined, and tested a multi-item scale "HospitalQual" that evaluates key factors influencing inpatient service quality in public and private hospitals. Through confirmatory factor analysis, the theoretical model was tested, and confirmed a 23-item, seven dimensional "HospitalQual" measurement model. The resultant dimensions showed good psychometric properties based on findings from various reliability and validity tests as well. The comprehensive Multi-level Structural Model is developed that covers the relationships among In-Patient Service Quality (IPSQ), In-Patient Satisfaction (IPST) and In-Patient Loyalty (IPL).

The present study highlights the importance of inpatient service quality and its relationship with patient satisfaction and loyalty in public and private hospitals. The HospitalQual, a scale for measuring the inpatient service quality, has been developed based on three constructs namely inpatient service quality, inpatient satisfaction and inpatient loyalty. And these constructs tested for the validity and reliability of the scale. The results show that Medical Service, Nursing Services, Supportive Services, Administrative Services, Patient Safety, Patient Communication and Hospital Infrastructure have a significant effect on overall inpatients' service quality. The HospitalQual theoretical model has further developed by using Confirmatory Factor Analysis and Structure Equation Modeling. The final HospitalQual model has emerged with 7 dimensions and 23 variables. The study found that there is a significant effect of inpatient service quality on inpatient satisfaction but not on inpatient loyalty. It also found that inpatient service quality has an indirect effect on inpatient loyalty through inpatient satisfaction. The study also compared the inpatient service quality, inpatient satisfaction and inpatient loyalty between public and private hospitals and found that there is a significant difference between the hospitals.

Chapter 1

INTRODUCTION

1.1 Healthcare Sector in India

Healthcare has been emerging as one of the fastest growing service sectors in India. The healthcare sector, which consists of hospitals, medical infrastructure, medical devices, clinical trials, outsourcing, telemedicine, health insurance and medical equipment, was valued at US$ 78.6 billion in 2012, and is expected to reach US $158.2 billion by 2017 (IBEF, 2013). As shown in the figure 1.1, the healthcare sector is expected to advance at a Compound Annual Growth Rate (CAGR) of 15 per cent during 2008-17.

There is an immense scope for enhancing healthcare services penetration in India, this presents ample opportunity for development of the healthcare industry. The factors such as rising income levels, ageing population, growing health awareness and changing attitude towards preventive healthcare, change in lifestyle, rapid growth in Indian infrastructure development, creation of demand for higher levels of healthcare, rising awareness of healthcare consumers, launch of innovative insurance schemes and financing policies are expected to boost healthcare services demand in future. The growth of the Indian healthcare sector is further driven by the 300 million strong middle class population with significant disposable income, which is likely to demand superior healthcare services.

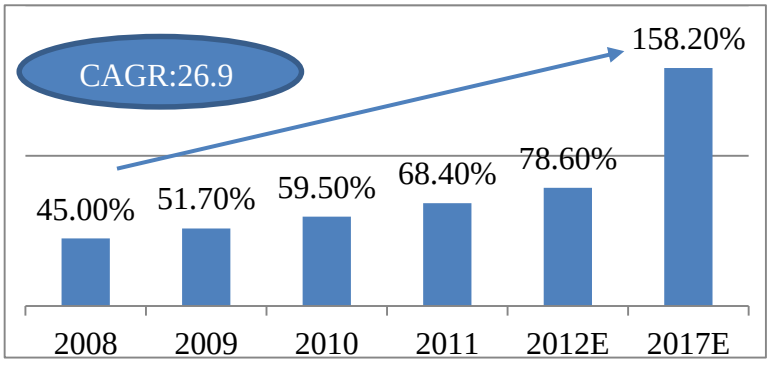

Figure 1.1: Growth of Healthcare Sector in India

Source: Indian Brand Equity Foundation, Healthcare Sector Report, August, 2013.

As shown in the figure 1.2, strong demand, quality and affordability, attractive opportunities and policy support are the important advantages of the Indian healthcare industry.

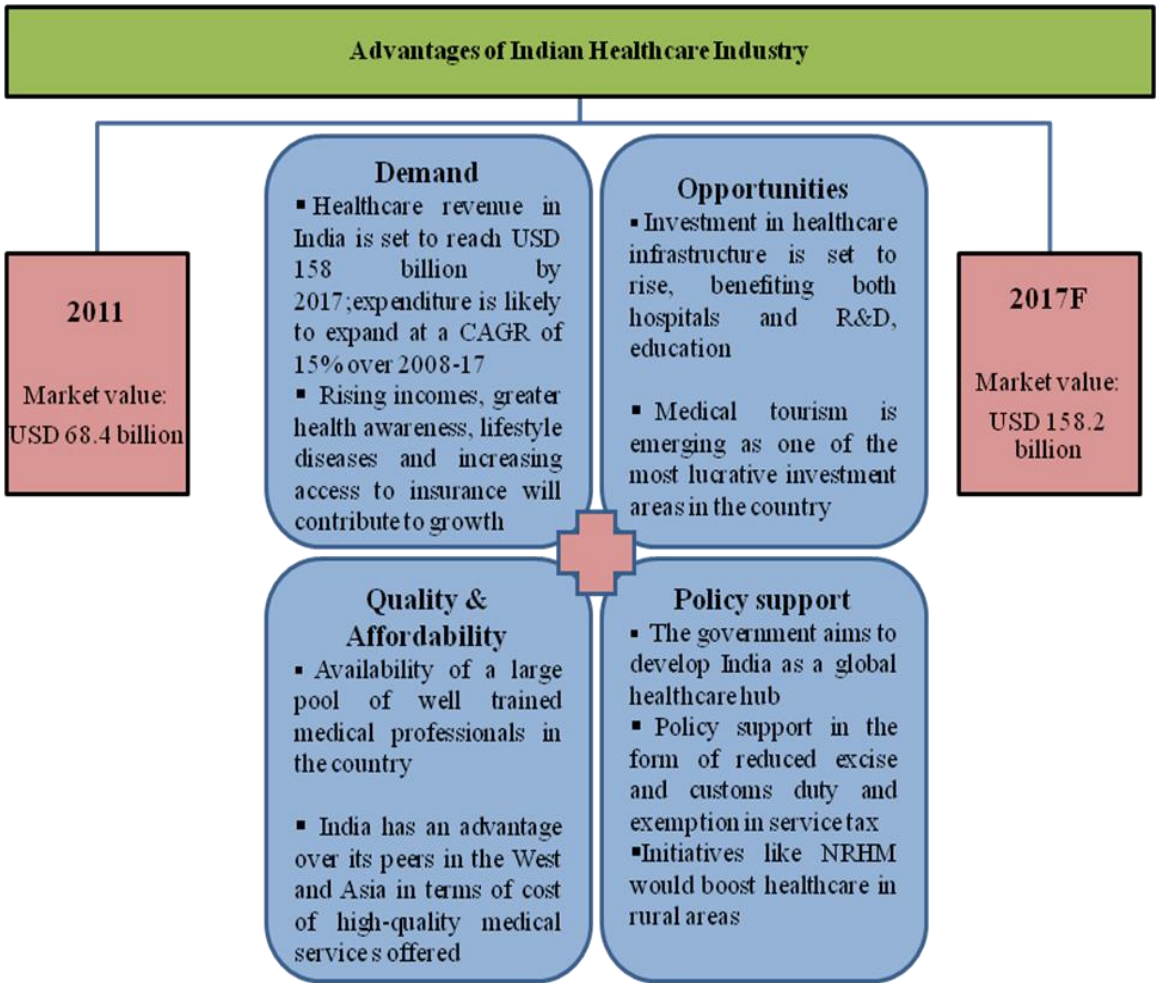

Figure 1. 2: Advantages for Healthcare Growth in India
Source: KPMG, Hospital Market – India by Research on India, Frost & Sullivan, LSI Financial Services, Aranca Research

1.2 Hospitals in India

Healthcare sector can be broadly functions through five important segments. They are Hospitals, Pharmaceutical, Diagnostics, Medical Equipment and supplies and Medical Insurance. The below figure (Figure1.3) provides the five segments of healthcare. The hospital segment holds a major share of the healthcare industry and is outpacing the

overall industry growth in India. The size of the private hospital industry in India is estimated to be around US$25billion as per ASSOCHAM and growing at a CAGR of 20%. The demand for hospital services has been consistently soaring in the country, with every class of the society demanding better quality and standards of healthcare (Dinodia Capital Advisors, November, 2012). Realizing the continuous growing demand, many investors worldwide are keen towards investing in the Indian hospital service market. The country is making strides in the right direction as evident from the 100% allowance of FDI in the hospital segment under the automatic route, since January 2000. According to "Indian Hospital Services Market Outlook" by RNCOS Industry Research Solutions, the country needs to cover the cumulative deficit of around 3 million hospital beds to match up with the global average of 3 beds per 1000 population (Indian Healthcare Industry, Dinodia Capital Advisors, November, 2012).

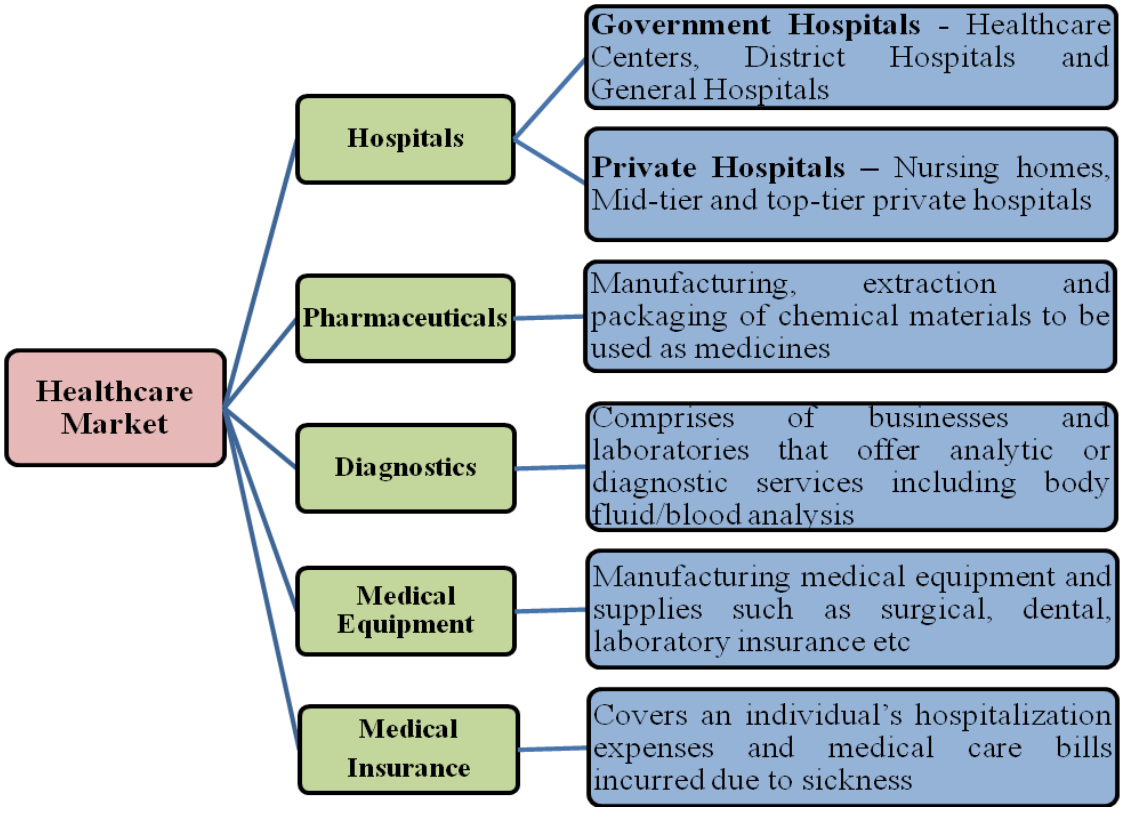

Figure1.3: Healthcare segments

Source: Healthcare Sector Report, August, 2013, Indian Brand Equity Foundation

However, out of total healthcare revenues in the country, hospitals account for 71 per cent, Pharmaceuticals for 13 per cent and Medical equipment and supplies for 9 per cent (Figure 1.4). There is a total of 12760 government hospitals with 576793 beds catering the health needs of Indians as of 01-01-2011 (National Health Profile, 2010).

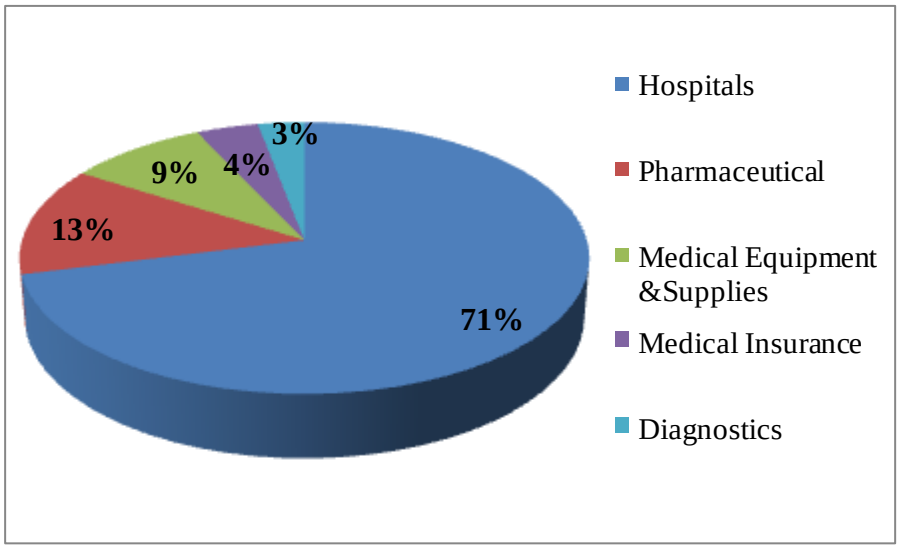

Figure1.4: Healthcare Market break-up by revenues 2012E
Source: Hospital Market – India by Research on India, Aranca Research Notes: 2012E – Estimates for 2012

1.3 Healthcare Sector in India - Public Sector

Health care services in India underwent a vast change over the last few decades and encompass the entire nation. The Planning Commission has allocated USD55 billion under the 12th Five-Year Plan to the Ministry of Health and Family Welfare, which is about three times the actual expenditure under the 11th Five-Year Plan. The share of healthcare in total plan allocation is set to rise to 2.5 per cent of GDP in the 12th Plan from 0.9 per cent in the 11th Plan. The 12th plan focuses on providing universal healthcare, strengthening healthcare infrastructure, promoting R&D and enacting strong regulations for the healthcare sector (Planning Commission, Ministry of Health & Family Welfare, GOI).

Indian requires proper health infrastructure to serve its growing population. Rural India, which accounts for over 70 per cent of the population is not provided with proper health

services. Only 3 per cent of specialist physicians cater to rural demand. About 1.8 million beds required by the end of 2025. Additional 1.54 million doctors and 2.4 million nurses required to meet the growing demand.

Table1.1: Health Infrastructure in India

Health infrastructure per 10,000 individuals (2009)			
	Physicians	Nurses and Midwifery personnel	Hospital beds
India	6.5	10.0	9.0
World median	14.5	28.1	30.0

Source: WHO World Health Statistics 2012

The Indian government has emphasized the need for increased outlays for health sector during the Twelfth Five Year Plan. Some highlights of the Union Budget 2013-14 for the healthcare are as follows:

- Health for all remains one of the priority sectors for the Government
- The Ministry of Health & Family Welfare has been allocated Rs 37,330 crore (US$ 6.46 billion). Of this, the new National Health Mission that combines the rural mission and the proposed urban mission will get Rs 21,239 crore (US$ 3.67 billion), an increase of 24.3 per cent over the RE
- Rs 4,727 crore (US$ 817.82 million) for medical education, training and research
- The National Programme for the Health Care of Elderly is being implemented in 100 selected districts of 21 States. Eight regional geriatric centres are being funded for the development of dedicated geriatric departments. Rs 150 crore (US$ 25.95 million) has been provided for the National Programme for the Health Care of Elderly
- Ayurveda, Unani, Siddha and Homoeopathy are being mainstreamed through the National Health Mission and Rs 1,069 crore (US$ 184.95 million) has been allocated to the Department of AYUSH

- Moreover, Rs 1,650 crore (US$ 285.47 million) was allocated for six AIIMS-like institutions

Several unique initiatives also have been undertaken by the state governments such as those in Andhra Pradesh, Tamil Nadu, Gujarat and Chattisgarh, have been trying to provide access to good quality healthcare for the economically challenged section of society through public-private-partnership schemes.

1.4 Healthcare Sector in India - Private Sector

The private healthcare sector is expanding on the back of increasing demand from the growing middle-class in India's largest cities. In addition, there is a substantial demand for high-quality and specialty healthcare services in tier-II and tier-III cities. All these factors are creating a bigger market for better healthcare services in the country (http://www.ibef.org/industry/healthcare-india.aspx). The healthcare industry in India is attracting a significant amount of capital from private investors and de-centralized healthcare delivery models are the flavor of the season among private equity investors. At present, chains of single specialty hospitals (such as eye or dental clinics), chains of diagnostic centers, chains of pharmacies, day-care surgery centers are all witnessing significant growth opportunities in the private sector.

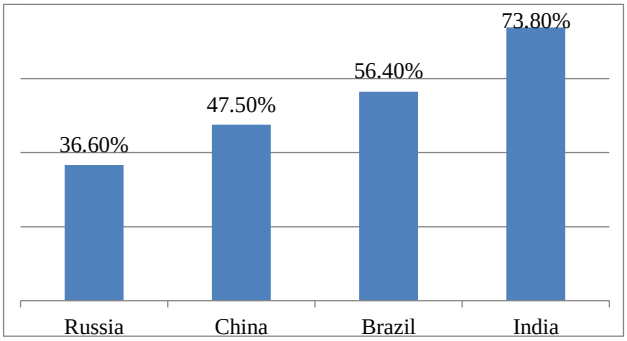

Figure 1.5: Share of Private sector in total health expenditure, 2009
Source: WHO World Health Statistics 2012, Aranca Research

The private sector has emerged as a vibrant force in India's healthcare industry, lending it both national and international repute. Rising incomes have led to greater affordability for superior quality healthcare facilities in the private sector. In India, private healthcare accounts for almost 74 per cent of the country's total healthcare expenditure. Private players have been constantly innovative in their efforts to provide better healthcare services to a wider customer base. The hospital market in India is estimated at USD54.7 billion at end-of 2012, with the private sector accounting for 82 per cent. Over 2009–12, the market size of private hospitals is estimated to have increased at a CAGR of 26.9 per cent. An Increase in the number of hospitals in Tier-II and Tier-III cities have fuelled the growth of the private sector

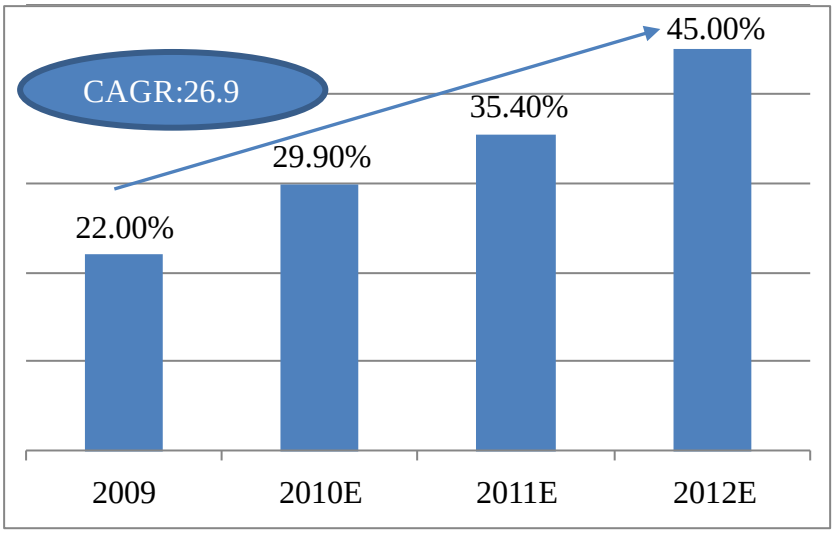

Figure1.6: Market size of private hospitals (USD billion)
Source: WHO Statistical Information System, Yes Bank, Aranca Research

1.5 Service Quality

The concept of service quality is difficult to define. Some definitions have been proposed by scholars have been done to explore the dimensions of the construct and to distinguish it from other closely related constructs such as customer satisfaction. The following are the some of the definitions of service quality:

"Service quality is a comparison between expectations and performance"(Parsuraman, Zeithaml and Berry, 1985, p42);

"An evaluative, affective, or emotional response" (Oliver & John E Swan, 1989, p. 1)

"Perception of service quality is determined by "Prior expectations of what will and what should transpire… and the actual delivered service" (Parasuraman, Zeithaml, &Berry, 1994, p. 111);

"Perhaps [Service] quality factors are those primarily under the control of management… in contrast, perhaps the [customer] satisfaction factors are those that impact the experiential aspects of the service purchase from the customer's point of view*"* (Iacobucci and Ostrom, 1995).

From the above definitions, it can be seen that there has been some consensus at the highest and most abstract level that the customer perceived service quality is a customer judgment based on a comparison between prior expectations and performance. However, even this has been called into question, with Cronin and Taylor find little support for the expectations construct, at least as an explicit construct that customers could readily quantify (Cronin and Taylor, 1994). This does not necessarily invalidate the conceptual definition, as the customer might be making implicit comparisons when arriving at their assessment of the service they have received. Despite some loose consensus, a clear, usable definition of service quality that can be applied to hospital services, particularly inpatient service quality does not exist in the literature.

Service quality is a many faceted concept and many studies have illuminated different aspects of service quality, without providing the definitive definition, if such a thing can exist. It is also unclear how existing definitions will transfer to the hospital services environment, where aspects of the tangible actions are directed towards inpatients. If there is a delay in discharge of a patient (e.g. delay in preparing the bill), will they perceive the service quality as poor? This is a case of delay in service delivery. Most studies have attempted to define the service quality in terms of its component parts, or

constructs. Accordingly, the present study takes a "bottom-up" approach to building a definition of inpatient service quality in a hospital.

Although the service sector makes up a substantial part of the economy, publications choose to address service quality a lot less, than the quality of products or manufacturing processes (Ghobadian, Speller, and Jones, 1994). This is so, because the characteristics of the physical products and the services are different and there are many ways to interpret the concept of service quality. While during industrial production the quality (the totality of the products' characteristics) and fitness (features deemed material or the prescribed, determinable and measurable features) may be clearly separated, in case of service differentiation is more complicated. Accordingly, in determining service quality, personal, subjective judgments play an important role. Relevant to the above quality-fitness duality, the set of characteristics expected by the individual corresponds to the quality side and the actual subjective judgment on the material service qualities, to the fitness side. Zeithaml defined perceived quality as: *"the consumers' judgment about an entity's overall excellence or superiority"* (Zeithaml, 1988, p. 3). This is rather a judgment or a subjective attitude, than an objective concept.

Moreover, service quality is harder to evaluate for the customers than the quality of products, because the person evaluating the service typically does not have the necessary expertise to do it or there are no objective measures. Customer judgment is rather subjective and it is affected by psychological factors, prior experiences and word-of-mouth. Considering the above discussion, it can conclude that in case of services the popular service quality definition, stating that "quality is good if it is deemed to be good by the customer" is especially true (Parasuraman, 1994a).

Service quality is a field of many ambiguities. It is hard to define what we understand under bad and under good service. What makes it more complicated is that different customers find different features important in the same service. The generally held "trust elements" and the "experience factors" after the service was delivered have an impact on

service assessment (Hentschel, 1995). The research results of Zeithaml (1981) also support that in evaluating service quality customers rely on *experience* and *trust* to a greater degree. The service is evaluated not only upon its outcome; the process of the service provision will be taken into consideration as well. As opposed to product quality, service quality can only be measured during the process itself. This procedural approach requires that tangible and intangible quality components are interpreted simultaneously. Grönroos (1982) describes this feature of service quality in the *technical - functional model* of service quality.

1.6 Disconfirmation and Performance-based paradigms

Service quality is determined by comparing the expectations with the perceived performance, that is, by disconfirmation. This correlation was the starting point of many researchers (Parasuraman et al., 1985, 1988, 1994) and one of most accepted service quality models, SERVQUAL, is based on this premise too. The real challenge of defining service quality originates from the difficulty of determining which characteristics or dimensions should be evaluated by the customer and by the problems of deciding how to interpret the degree of the given characteristic, that is, the expectations formulated relevant to them. According to the Gap-model the perceived service quality is "*the degree and direction of the discrepancy between consumers' perceptions and expectations"* (Parasuraman et al.,1988, p. 17). In other words, expectations are clearly determined by the individual customer as to whether the expectations have to be interpreted in an explicit manner, or simply measuring the individual characteristics (promises in connection with fitness) would suffice. The latter theory is supported by research results from Cronin and Taylor (1992, 1994), Teas (1993, 1994), Liljander and Strandvik (1994), and Dabholkar et.al., (2000), concluding that service quality is the quality perceived by the customer.

Academicians and practitioners in service operations, while accepting the meanings of the words 'products' and 'services', have conceded that the quality - as it pertains to services – could be defined differently from the definition of quality of products. Service

quality has been recognized as an abstract construct that is difficult to define and measure (Parasuraman, Zeithaml and Berry 1985; 1988: 13), and thus, it remains management field's one of the most important problems (Cravens 1988, cited in Cronin & Taylor 1992:55). Gronroos (2001) and Parasuraman, Zeithaml and Berry (1985: 41) propose that high quality service may allow an organization to gain competitive advantage simply by achieving customer satisfaction.

However, service quality has become one of the important aspects of the service sectors including healthcare sector. But, the management of service quality needs a different approach when it comes to the healthcare sector. The studies of service quality on different sectors have been increasing for the past four decades (Philip & Hazlett, 1997). Among all the service sectors, hospitals need a special emphasis on evaluating the issues related to quality of services and its measurement.

1.7 Service quality - The theoretically proven construct in Healthcare

A healthcare service is one that requires high consumer involvement in the consumption process, and Lengnick-Hall (1995) argued that the traditional health sector views of technical quality and patient satisfaction were inadequate to manage the complex relationships between the healthcare provider and the patient. Importantly, effective healthcare relies significantly on the co-contribution of the patient to the service delivery process. Studies have also evidenced that compliance with medical advice and treatment regimes is directly related to the perceived quality of the service and the subsequent resulting health outcome (O'Connor et al., 1994; Irving and Dickson, 2004; Sandoval et al., 2006).

Over the past few decades in the services marketing sector, much work has been undertaken to evaluate the consumer's perception of service quality, and a number of service models have been developed, with the gap model (Parasuraman et al., 1985) and its accompanying SERVQUAL (Parasuraman et al., 1988) having offered significant advances to the understanding and measurement of perceived service quality. Perceived

health service quality has been studied extensively in the private healthcare sector; with SERVQUAL having been used frequently in a modified form and predominantly in the "for profit" American health sector (O'Connor and Trinh, 2000).

Brady and Cronin (2001) advanced the multidimensional hierarchical conceptualization offered by Dabholkar et al. (1996) by combining that model with the three factor model of Rust and Oliver, and proposed a hierarchical multidimensional model of service quality. Based on this work, Dagger et al. (2007) have proposed service quality as a multidimensional, higher order constructs, with four overarching dimensions (interpersonal quality, technical quality, environmental quality and administrative quality) and nine sub-dimensions. They suggest that consumers evaluate service quality at a global level, a dimensional level and at a sub-dimensional level, with each level influencing perceptions of the level above. From their work with private oncology patients, Dagger et al. (2007) have shown that their model reflects the private patient's service quality perceptions and they have developed and tested a scale for measuring perceived private healthcare service quality. Yet this work has little impact, as the study and measurement of patient satisfaction continue to be the key target for consumer research in the health sector.

Further, only a few studies have sought to evaluate the provider understanding of the patient's perceptions of health service quality (O'Connor et al., 2000), and very few studies of perceived public healthcare service quality have been undertaken (Sanchez-Perez et al., 2007). Finally, Brown (2007) editorially highlighted that the patient is becoming an ever more silent partner in the health care system, as their views of quality have largely been sidelined by the number of attempts to exclusively determine patient satisfaction with health care. Research that focuses on strengthening our understanding of the meaning, measurement, and management of perceived service quality from the patient's perspective in healthcare is now arguably paramount (Liz Gill and Lesley White, 2009).

1.8 Customer Satisfaction

The concept of Customer Satisfaction (CS) has drawn the interest of academics and practitioners for more than three decades in the light of the fact that customers are the primary source of revenue. Churchill and Surprenanat (1982) define customer satisfaction as an outcome of the 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 service (Westbrook et. al, 1981). The former conceptualization recognizes that satisfaction is determined by a cognitive process, 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. Currently, the most widely adopted description of Customer Satisfaction (CS) is a process: an evaluation between what was received and what was expected (Oliver, 1977, 1981; Olson and Dover, 1979; Tse and Wilton, 1988). By looking at satisfaction as a process, these definitions concentrate on the antecedents to satisfaction rather than satisfaction itself.

The most "well-known" descendent of the discrepancy theories is the expectation disconfirmation paradigm (Oliver, 1977, 1981). According to this paradigm consumers' satisfaction judgment is the result of consumers' perceptions of the difference between their perceptions of performance and their predictions (or expectations) of performance. Positive disconfirmation leads to increased satisfaction, with negative disconfirmation having the opposite effect. Many studies support the disconfirmation paradigm, but others do not; for example, Churchill and Suprenant (1982) found that neither disconfirmation nor expectations have had any effect on Customer Satisfaction with durable products.

Poisz and Van Grumbrkow (1988) viewed the satisfaction as a discrepancy between the observed and the desired. This is consistent with value-percept disparity theory (Westbrook and Reilly, 1983) which was developed in response to the problem that consumers could be satisfied by aspects for which expectations never existed (Yi,1990).

The value-percept theory views satisfaction as an emotional response triggered by a cognitive-evaluative process (which is the comparison of the "object" to one's values rather than expectation). Consumers want consonance (or no disparity) between their values (needs, wants and desires) and objects of their evaluations. Equity theory has also been applied to customer satisfaction (Fisk and Young, 1985; Swan and Oliver (1985). In this theory, individuals compare their input/output ratios with those of others (Yi, 1990). In a transaction relationship, therefore, a consumer could compare their net gain to the marketer's or any other reference group (Merton and Lazarsfeld, 1950). If this was perceived to be fair, then the consumer would be satisfied. Thus, in these cases, satisfaction is an outcome of inter-personal rather than intrapersonal comparisons.

However, Johnson, Anderson & Fornell (1995) specified that "the modeling of customer satisfaction depends critically on how satisfaction is conceptualized." Further, Mano & Oliver (1993) have stated that satisfaction is a cognitive, affective and behavioral reaction towards the specific service event. From the above views, it can be said that the conceptualization of customer satisfaction is grounded in the theories which support the construct of satisfaction. Therefore, definitions of satisfaction depend on the underlying theoretical nature of the satisfaction.

1.9 Service Quality and Customer Satisfaction

Many research studies have been conducted in different areas to determine the relationship between the service quality and customer satisfaction. A number of studies have demonstrated the significant relationship between service quality and satisfaction. Studies also have proven that service quality is an important performance predictor for customer satisfaction. Researchers considered service quality as an antecedent to satisfaction. Bolton and Drew (1994) pointed out that "customer satisfaction depends on preexisting or contemporaneous attitudes about service quality". Hence, it is very important to understand the service quality factors which will decide the customer satisfaction.

1.10 Service quality and satisfaction in healthcare

Understanding service quality and satisfaction have, for some considerable time, been recognized as critical to measure the services. The study of Donabedian (1980) has identified the importance of patient satisfaction and provided much of the basis for research in the area of service quality in healthcare. In the healthcare sector, the importance of measuring patient satisfaction is well articulated (Lin and Kelly, 1995) with patient satisfaction having been studied and measured extensively as a standalone construct and as a component of outcome quality (Heidegger et al., 2006) and in particular in quality care assessment studies (Sofaer and Firminger, 2005).

Besides, the service quality literature explains that the concept of satisfaction is complicated (Heidegger et al., 2006), irrespective of the area in which it is studied. It is a multidimensional concept; not yet tightly defined; and part of an apparently yet to be determined complex model. (Hawthorne, 2006). Significant divergence can be found in the healthcare literature, for instance Gonzales et al. (2005) noted that satisfaction questionnaires have been the most commonly used method to survey patient perceptions of healthcare for more than 30 years, but only over the previous five years, had studies tried to ensure that the validity of the instrument was well grounded. Yet in contrast, the main finding of a review of the patient satisfaction literature (Hawthorne, 2006) concluded that none of the instruments reviewed could be considered satisfactory. Hawthorne found that there were thousands of patient satisfaction measures available, which have been developed on an "ad hoc" basis, with insufficient evidence of their psychometric properties.

Further, quality in healthcare has been studied largely from the clinical perspective, excluding the patient's perception of service quality. According to Crowe et al. (2002), the subjective affective component of the patient satisfaction construct makes its measurement "probably a hopeless quest" and its study is largely fraught as it has lacked precision, at the expense of exact science, with many researchers having undertaken studies of a purely exploratory nature (Gilbert and Veloutsou, 2006).

Healthcare sector research into patients' perceptions of the dimensions of service quality (perceived service quality) has been limited (Clemes et al., 2001), yet studies seeking to assess the components of the quality of care in health services predominately continue to measure patient satisfaction (Lee et al., 2006). There is no consensus on how to best conceptualize the relationship between patient satisfaction and their perceptions of the quality of their healthcare. O'Connor and Shewchuk (2003) emphasized that much of the work on patient satisfaction is based on simple descriptive and correlation analyses with no theoretical framework. They concluded that, with regard to health services, the focus should be on measuring technical and functional (how care is delivered) quality and not patient satisfaction.

A study by Gotlieb et al. (1994) on patient discharge, hospital perceived service quality and satisfaction offered evidence of a clear distinction between perceived service quality and patient satisfaction. They found that patient satisfaction mediated the effect of perceived service quality on behavioural intentions, which included adherence to treatment regimes and following provider advice. Cleary and 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, Taylor (1999) highlighted that confusion continued in the sector regarding the differentiation of service quality from satisfaction and reported that some authors, for example Kleinsorge and Koenig (1991), referred to them as synonymous terms. Nevertheless, patient satisfaction continues to be measured as a proxy for the patient's assessment of service quality (Turris, 2005).

1.10.1 Patient satisfaction in healthcare

The major patient satisfaction theories were published in the 1980s with more recent theories being largely "restatements" of those theories (Hawthorne, 2006). Among the patient satisfaction theories, five key theories are worthwhile to be mentioned:

1. Healthcare quality theory of Donabedian (1980) proposed that satisfaction was the principal outcome of the interpersonal process of care. He argued that the

expression of satisfaction or dissatisfaction is the patient's judgment on the quality of care in all its aspects, but particularly in relation to the interpersonal component of care.

2. Discrepancy and transgression theories of Fox and Storms (1981) advocated that as patients' healthcare orientations differed and provider conditions of care differed, that if orientations and conditions were congruent then patients were satisfied, if not, then they were dissatisfied.
3. Expectancy-value theory of Linder-Pelz (1982) proposed that satisfaction was mediated by personal beliefs and values about care as well as prior expectations about care. Linder-Pelz identified the important relationship between expectations and the variance in satisfaction ratings and offered an operational definition for patient satisfaction as "positive evaluations of distinct dimensions of healthcare" (p578). The Linder-Pelz model was developed by Pascoe (1983) to take into account the influence of expectations on satisfaction and then further developed by Strasser et al. (1993) to create a six factor psychological model: cognitive and affective perception formation; multidimensional constructs; dynamic process; attitudinal response; iterative; and ameliorated by individual difference.
4. Determinants and component theory of Ware et al. (1983) propounded that patient satisfaction was a function of patients' subjective responses to experienced care mediated by their personal preferences and expectations.
5. Multiple models theory of Fitzpatrick and Hopkins (1983) argued that expectations were socially mediated, reflecting the health goals of the patient and the extent to which illness and healthcare violated the patient's personal sense of self.

However, it should be noted that whilst SERVQUAL has been used in healthcare, it was not designed specifically to measure perceived health service quality and it certainly does not measure satisfaction. A review by Sitzia (1999) found that 81 percent of the studies used a new instrument, an additional 10 percent had modified an existing instrument and 60 percent failed to report any psychometric data. Sitzia concludes that the instruments

evaluated by the meta-analysis demonstrated little evidence of reliability or validity. A more recent extensive review of patient satisfaction measures identified over 38,000 articles on patient satisfaction using the Medline/Pub Med database plus over 10,000 websites through internet based search (Hawthorne, 2006). This study assessed instruments that met its criteria for inclusion and highlighted that most papers did not adequately report patient satisfaction; few reported the instrument used, their psychometric properties or the actual results; and most reported patient satisfaction based on a single item.

11.1 Customer Loyalty

Customer loyalty has been defined as "the degree to which a customer exhibits repeat purchasing behavior from a service provider, possesses a positive attitudinal disposition toward the provider, and considers using only this provider when a need for this service arises" (Gremler and Brown, 1996, p. 173). This definition incorporates action, loyalty and commitment to repurchase (Oliver, 1999) with affective commitment, i.e. emotional attachment, identification, and involvement (Allen and Meyer, 1990). Commitment is believed to drive the expansion and enhancement of the relationship (Bendapudi and Berry, 1997) and to decrease the propensity to leave (Ganesh et al., 2000). Loyal customers are more likely to spread positive word-of-mouth (Gremler and Brown, 1999), buy additional services and accept premium prices (Zeithaml et al., 1996). Loyal customers are desirable because they are believed to be less motivated to search for alternatives and to possess a higher resistance to competitors' blandishments (Dick and Basu, 1994) and to adverse information from experts (Narayandas, 1998). Their tolerance for waiting when the service is temporarily unavailable is also higher (Narayandas, 1998), which is particularly important when an online service is inaccessible due to technical problems. Customer loyalty has generally been conceptualized as an outcome of the quality-satisfaction-loyalty chain (Anderson and Mittal, 2000; Oliver, 1996; Rust et al., 1995). The links in this chain are discussed and examined in the present study in the context of Indian hospitals.

1.12 Customer Satisfaction and Customer Loyalty

To sustain in an increasingly competitive world, it is highly essential to be customer oriented (Kotler, 2000). The underpinning marketing literature proves that the identification and satisfaction of customer needs are highly essential for customer retention (Day, 1994). There is an increasing recognition that the ultimate objective of customer satisfaction measurement should be to win customer loyalty. Fornell (1992) argues that higher customer satisfaction will result in increased customer loyalty. However, the ability of customer satisfaction scores to predict loyalty is not well demonstrated. According to Bitner (1990) customer satisfaction is the difference between the expectations and perceived performance, which decides the post purchase response towards a particular brand. The satisfaction/dissatisfaction is considered to act as an antecedent to loyalty. Frequent or cumulative satisfaction is required to affect loyalty, so that individual satisfaction episodes become aggregated or blended. Oliver investigated the relationship between satisfaction and loyalty. After extensive analysis, the author concluded that satisfaction and loyalty are two distinct concepts where satisfaction is necessary, but it requires other factors for the customer to become loyal. Further, Gronholdt, Martensen & Kristensen (2000) conducted an empirical study in four industry groups which resulted in satisfaction having a positive linear effect on loyalty, but the regression slopes are a little different across the industries that represents the degree of competition in the market. As a result, satisfaction measurement has been displaced by customer loyalty; primarily customer loyalty is seen as a better predictor of actual behavior.

The above discussion provides theoretical background on the relationship between service quality, satisfaction and loyalty. It is well understood from the discussion that service quality is a predictor and it influences customer satisfaction as well as loyalty. The current study focuses on the characteristics and relationships between these constructs.

1.13 Statement of the Problem

The concern for service quality reached a unique level in various service sectors including healthcare. Hospitals which are the part of the healthcare industry along with allied sectors are facing the problem of providing the quality services to the patients in order to meet their expectations. Managing services effectively is a one of the main challenges in the service management domain because of intangibility, heterogeneity, perishability, inseparability of services and massive human involvement in service delivery. Hospital services have a unique position in the service industry due to its very nature of the highly involved risks of treating the human beings. This uniqueness makes measuring service quality in a hospital setting more complex.

It is important for the service providers to understand how the service is evaluated by the customers so that providers manage these evaluations and influence customers in a positive direction (Gaster & Squires, 2003). In this connection, the patient's opinion provides valuable inputs about the functioning of the hospital, which needs be taken into account while evaluating the quality of the services. Therefore, to evaluate the quality of services in the hospitals there is a need to measure the perceptions of the patients regarding the quality of services and their overall satisfaction to enhance the quality of the services.

In this context, hospitals required to make concerted efforts to improve the quality of their services to meet customer expectations, satisfaction and reactions. Although patient satisfaction can be predicted by service quality attributes, very few empirical research studies have been carried out in a field of hospital services in India.

1.14 Significance of the Study

In the globalized competitive hospital environment, service quality has been increasingly identified as the main factor in distinguishing between services and building competitive advantage. Unlike in the earlier days when hospitals were judged by the medical services they provided, they are now also judged on the quality of service they give, that is,

personalized services rendered by courteous, caring and friendly staff. Hospitals will do even better if they could possibly combine high tech with a high touch. Service quality is designed to measure functional quality only (defined as the manner in which the health care service is delivered to the patient). However, functional quality in a health care setting cannot be sustained without accurate diagnoses and procedures. Such technical quality is the focus of research that is being conducted by a number of healthcare professional organizations, including Joint Commission International (JCI), National Accreditation Board for Hospitals & Health care Providers (NABH) and Quality Council of India (QCI) etc. For the long-run success of a health care organization, both functional and technical quality have to be monitored and managed effectively (Babakus Emin & W Glynn Mangold, 1992). The hospitals need to take care of the quality of the services that they provide to the patients. Hence, the need to focus on the management aspects of hospitals has become more relevant than before. Measuring service quality as perceived by patients is one step to improve management of public and private hospitals. In this context, it is very essential to study the service quality in Indian hospitals. The present research will be an attempt at developing an instrument for measuring perceived in-patent service quality for multi-specialty hospitals in the Indian context.

1.15 Research Process and Structure of the Thesis

To conduct the study, initially a review of the service quality literature along with the exploration of service quality in hospitals was chosen. Further, this study reviewed the literature on the concepts of satisfaction and loyalty in services marketing literature, with a special focus on the hospital sector. These reviews helped in identifying the research gaps for service quality assessment and the relationships between these constructs in hospital. A research framework was formulated based on the identified research gap. The service quality determinants were used to prepare the framework to study the inpatient's perceptions of service quality in hospital. The same service quality factors were further considered as antecedents to study the concepts of patient satisfaction and loyalty. A survey questionnaire was designed to collect the inpatient's perception of these three constructs.

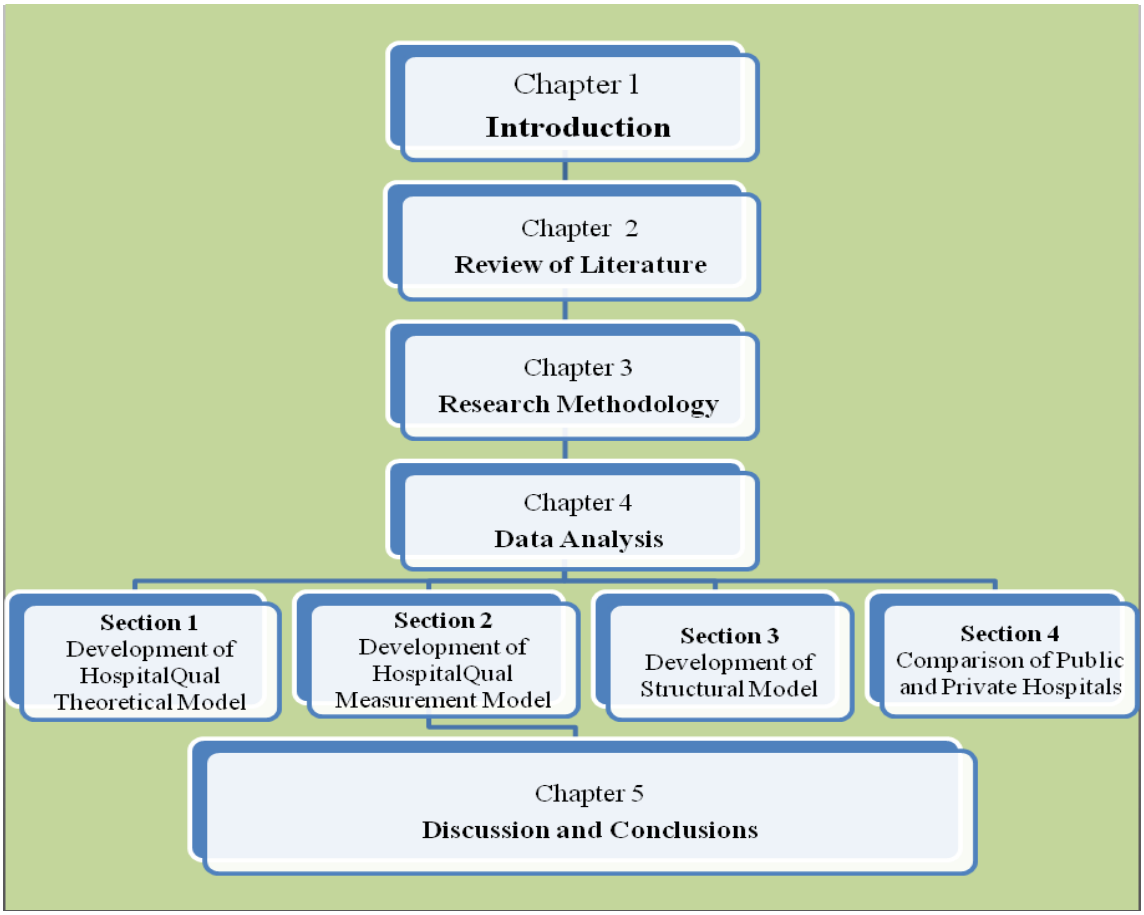

Figure 1.7: The Thesis Structure

The data analysis was carried out by making use of multivariate statistical methods: Explorative Factor Analysis (EFA), Confirmative Factor Analysis (CFA) and Structural Equation Modeling (SEM). The first section of data analysis consists of developing a HospitalQual theoretical model by identification of the critical factors. The development of the survey questionnaire is a part of this section. The next section of data analysis refers to the development of the HospitalQual measurement model by testing and confirming the theoretical model. The third section of data analysis deals with the development of a structural model to identify the relationships between the constructs. The last section deals with the comparison of the service quality and satisfaction with regard to public and private hospitals, male and female and the insurance and non-insurance patients. A great deal of effort has been put to minimize Common Method Bias (CMB) to make the research more effective. The study finally discusses the research

findings and contributions to the existing body of knowledge. An overview of the chapters and the structure is shown in figure 1. 7.

1.16 Organization of the study

The present study is organized in five chapters as discussed below:

Chapter 1 – Introduction

Introduction chapter provides a brief outline of the overall study. The chapter deals with the brief overview of the Indian healthcare sector and discussed the public and private hospitals in India. The chapter also presents the conceptual and contextual background to the study, before proceeding onto the problem statement. The conceptual and contextual background of the service quality, satisfaction and the loyalty has been discussed with the special focus on healthcare in general, hospitals in particular. The problem statement explains specifically why an evaluation of inpatient service quality and satisfaction is needed in Indian hospitals. The chapter also includes the problem statement, the significance of the study and the research process and the structure of the thesis. Finally the chapter also presents the organization of the thesis.

Chapter 2 – Review of Literature

The second chapter reviews the concepts of service quality, satisfaction and loyalty in general services marketing, and particularly in hospital and healthcare literature. It includes the overview of the SERVQAUL and SERQPREF models and presents the criticism of SERVQUAL model. The chapter deals with the studies conducted on service quality in global and Indian hospitals. It includes the relationship among the service quality, satisfaction and loyalty. The chapter presents the conceptual framework of research model followed by the research gap and the summary of the chapter.

Chapter 3 – Research Methodology

This chapter justifies the research design and the research methods that helped to guide the research, data collection and analysis process. The research questions are framed

based on the research gap identified previously and objectives are set. The conceptual models with ensuing hypotheses are stated. Sample distribution, justification of the sample size and a brief description of the data analysis tools and methods are also mentioned.

Chapter 4 – Data analysis

The identification of pre-acclaimed service quality attributes were carried out for possible HospitalQual instrument development through in-depth interviews and validating the attributes through expert opinions and pilot study. The chapter four has been divided into four sections. Section 1 deals with a HospitalQual theory building approach through exploratory factor analysis. The broad aim of the exploratory study is to identify inpatient service quality attributes and aggregate them into quality domains by means of exploratory factor analysis. This section also presents the statistical justification of the scales and analytical methods used in the study. The procedure for validity and reliability checks are also discussed in detail.

The second section contains the HospitalQual theory testing approach through Confirmatory Factor Analysis. The broad aim of this study is to confirm the inpatient service quality attributes and dimensions developed through exploratory factor analysis. A higher order model also proposed and confirmed through findings. HospitalQual first order model and second order models were also validated through convergent validity and discriminant validity.

In section third HospitalQual structural model has been tested and the structural relationships along with validity and reliability were established through the findings. The face validity, convergent validity, discriminant validity and nomological validity were tested through appropriate tests. All the proposed hypotheses of the study were tested and results discussed. Section four deals with the comparison of inpatient service quality, satisfaction and loyalty in public and private hospitals.

Chapter 5 - Discussion and Conclusion

First, a summary of the thesis is presented. Then, the chapter introduces the contribution of this research to academic theory and to practice, then to industry theory and practice and discusses the findings of the study in particular and general. Afterwards, the managerial, methodological and theoretical implications of the findings are discussed comprehensively. Then the research limitations of both theoretical and practical nature were discussed. Then the chapter concludes with suggestions for future research.

The next chapter deals with review of literature pertaining to the service quality, satisfaction, loyalty and the relationships among these concepts in general and more particularly in the context of healthcare and hospitals.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

The present chapter reviews the literature on the three main areas of interest such as models of service quality, studies on service quality in global and Indian hospitals and the relationship between service quality, satisfaction and loyalty. First, the chapter deals with the pertinent literature related to service quality in general. Since the proliferation of service quality research in the early 1980s, different models of service quality have been proposed and empirically tested by different researchers. An overview of the SERVQUAL and SERVPREF, two important service quality models is indispensable at the outset of this study; hence the models are discussed and the chapter also includes the criticism of SERVQUAL model. Second, a review of service quality in global and Indian hospitals is conducted and exploration of dimensions of service quality in hospital is presented in this chapter. In view of the fact that there are studies on service quality across the globe, more emphasis is placed on discussing dimensions or attributes of service quality in hospitals.

Then the chapter covers the review on the relationship between service quality, satisfaction and loyalty in general and more particularly in hospital and healthcare. Such a review becomes critical to understand the relationship between the three variables and to identify the conceptual framework of the study. The chapter includes the conceptual framework and the research gaps identified based on the literature, followed by the summary.

2.2 Service Quality

Most of the published works about service quality prior to the early 1980s have come from practitioner sources rather than academic research. Early pioneers in the service quality study such as Christian Gronroos of Sweden, A. Parasuraman, Valarie Zeithaml and Leonard Berry of United States have laid down building blocks through their

rigorous academic research. Their studies were based on synthesis of services marketing literature, customer satisfaction research and the limited writing on services.

A close examination of business industries in the 1990s revealed that the concept of service quality has received a great deal of interest as a key strategic factor for product differentiation and for increases in market share and profits (Bolton, Lemon and Verhoef 2004: 278; Luo & Homburg 2007: 113). When service providers understand how services are assessed by their customers, it becomes possible to identify how to manage these assessments and how to influence them in a positive direction (Gaster & Squires 2003:57; Seth, Deshmukh and Virat 2005). Although it is difficult to define the authenticity of service quality (Brown & Swartz 1989: 93; Schneider, B & White S.S., 2004:9), some researchers have reached a consensus on the fact that service quality should be defined and measured from the customers' perspective. Thus, service quality appears to be predominantly defined from the perspectives of customers in a given service organization. Many definitions of service quality maintain that this is the result of an assessment process, whereby customers compare their perception of the service to be received (Haywood- Farmer J, 1988:19). Zeithaml and Bitner (1996: 117) also define service quality as the "delivery of excellent or superior service relative to customer expectations." The most widely accepted definition of perceived service quality is that it represents the discrepancy between customers' expectations and their perceptions of the service performance, which is basically found on the expectancy disconfirmation theory (Churchill & Suprenant 1982; Oliver 1993; Parasuraman, Zeithaml and Berry 1994; Tse and Wilton 1998). According to Cronin and Taylor (1992), the concept of service quality is primarily based on the quality of services as perceived by customers.

However, SERVQUAL and SERVPERF are the two major service quality models that have been using worldwide to measure service quality in various service sectors. The following section provides an overview of the two models followed by the discussion of the limitations of SERVQUAL model.

2.3 SERVQUAL Model

The well-documented "service quality" model of Parasuraman et al., is widely used as a conceptual framework for measuring service quality. The model was introduced as "Service-quality" (SERVQUAL) by Parasuraman et al., (1985) and initially identified 10 different dimensions of service quality namely, tangible, reliability, responsive, communication, credibility, security, competence, courtesy, understanding and knowing the customer, and access. The dimensions were then reduced to five at later stages of research; Parasuraman, Zeithaml, & Berry (1988) proposed that Service-Quality is a function of the differences between expectation and performance along the quality dimensions. SERVQUAL basically configures the gap where quality improvement is needed using the Service-Quality dimensions. They developed a Service-Quality model based on gap analysis as shown in figure 2.1.

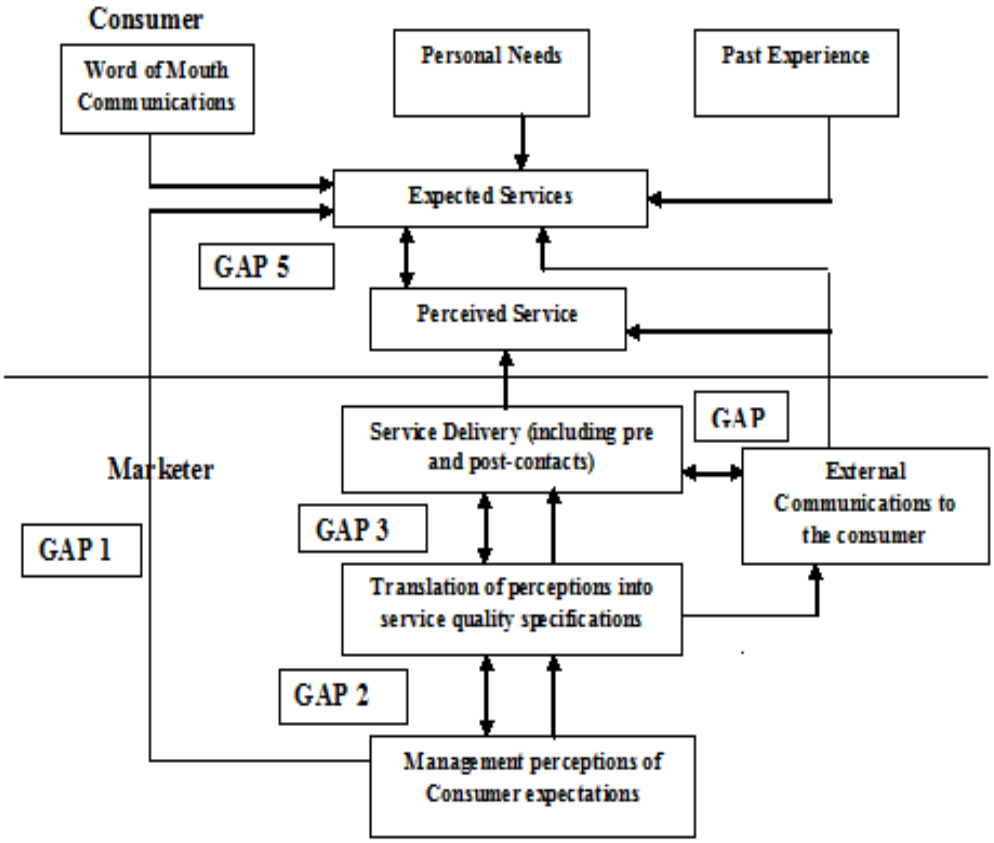

Figure 2.1: Service Quality Gap Model (Parasuraman et al., 1988)

The definition of each of the gaps is given below:

- Gap 1: difference between consumer expectations and management perceptions of consumer expectations.
- Gap 2: difference between management perceptions of consumer expectations and service quality specifications.
- Gap 3: difference between service quality specifications and the service actually delivered.
- Gap 4: difference between service delivery and what is communicated about the service to the consumer.
- Gap 5: difference between consumer expectations and perceptions

According to this model, the service quality is a function of perception and expectations and can be modeled as:

$$SQ = \sum^{k}_{j=1} (P_{ij} - E_{ij})$$

Where: SQ = overall service quality; k = number of variables.

P_{ij} =Performance perception of stimulus i with respect to attribute j.

E_{ij} = Service quality expectation for attribute j that is the relevant norm for stimulus i.

According to SERVQAL Model, service quality occurs when expectations are met (or exceeded) and a service gap materializes if expectations are not met. The gap score for each statement is calculated as the perception score minus the expectation score. A positive gap score implies that expectations have been met or exceeded and a negative score implies that expectations are not being met. Gap scores can be analyzed for individual statements and can be aggregated to give an overall gap score for each dimension.

2.4 SERVPERF Model

Another popular service quality model is the SERVPERF was developed by Cronin and Taylor (1992). They started out by presuming that the conceptual premises of the SERVQUAL model and the methodology of measuring service quality developed from it

are inadequate. They argued that the service quality measurement method, originated from the gap model (perceived performance – minus expectation formula) is not supported by theoretical or empirical research. They pointed out that the marketing literature rather supports its measurements made relative to performance. To support their hypothesis they compared their SERVPERF model, based on the perception paradigm with three alternative models on the different service areas (banking, cleaning service, fast-food restaurant, pest control). The original disconfirmation based SERVQUAL: SQ = P – E (performance–expectations), Weighted SERVQUAL: SQ = W× (P-E) [importance×(performance–expectations)], SERVPERF:SQ=P (performance), Weighted SERVPERF: SQ = W×P (importance × performance).

They completed reliance and validity tests by applying the 22 statements of the SERVQUAL scale and the seven point Likert-scale. They examined the reliability by the Cronbach alpha. The SERVQUAL model's (1) indicator was between 0,849 and 0,901, and SERVPERF's indicator (3) between 0,884 and 0,964. They measured the standard deviation, explained by the models and by adjusting determination coefficient (adjusted R_2). The explicative potential of the SERVPERF always exceeded that of the alternative models and the unweighted models showed a higher R^2 value in all cases than the weighted counterparts (Cronin and Taylor, 1992).

Cronin and Taylor held that the SERVQUAL model confuses satisfaction and attitude. Their research results proved the hypothesis: service quality needs to be interpreted both theoretically and practically as the attitude of the customer. Their empirical conclusions also showed that using and administering SERVPERF is simpler (the 22 questions need to be asked only once) and the SERVPERF scale exceeds the reliability and validity of the SERVQUAL. They also pointed out that weighing the results do not improve the model`s capacity to project. They also showed that the five service quality dimensions determined by Parasuraman et al. (1988) cannot be proved in the studied service areas; rather service quality is a unidimensional concept (Cronin and Taylor, 1992, pp. 61-65.). Parasuraman et al. (1994) in their response to the critical comments of Cronin and Taylor admitted that SERVPERF has better projection potentials, but maintained that

SERVQUAL diagnostic adequacy is higher and that their method provides a lot more information for managerial analysis. While Cronin and Taylor opined that by illustrating service quality determined by the SERVPERF method in relation to time and other indicators and by observing the trends, the managers may receive useful information in support of their decisions (Cronin and Taylor, 1994, p. 130).

2.5 Criticism on SERVQUAL Model

The SERVQUAL model is based on the Expectancy disconfirmation paradigms and the model SERVPERF works on the concept of "perception only" paradigm of service quality. Review of professional publications shows that the late service quality models and the measurement models, mostly originated from the so-called Nordic model developed by Grönroos, and the SERVQUAL model established by Parasuraman et al. (1998). Notwithstanding its growing popularity and widespread application, SERVQUAL has been subjected to a number of theoretical and operational criticisms which are detailed below (Table2.1):

Table 2.1: Theoretical and operational Criticism of SERVQUAL

Theoretical Criticism of SERVQUAL
➢ Paradigmatic objections: SERVQUAL is based on a disconfirmation paradigm rather than an attitudinal paradigm; and SERVQUAL fails to draw on established economic, statistical and psychological theory
➢ Gaps model: There is little evidence that customers assess service quality in terms of P – E gaps.
➢ Process orientation: SERVQUAL focuses on the process of service delivery, not the outcomes of the service encounter
➢ Moments Of Truth (MOT): Customers' assessments of SQ may vary from MOT to MOT.

Operational Criticism of SERVQUAL
➢ Expectations: Consumers use standards other than expectations to evaluate SQ; and SERVQUAL fails to measure absolute SQ expectations ➢ Item composition: Four or five items cannot capture the variability within each SQ dimension ➢ Moments Of Truth (MOT): Customers' assessments of SQ may vary from MOT to MOT. ➢ Polarity: The reversed polarity of items in the scale causes respondent error ➢ Two administrations: Two administrations of the instrument cause boredom and confusion. ➢ Variance extracted: The over SERVQUAL score accounts for a disappointing proportion of item variances

Source: Buttle, (1996)

Carman (1990) questioned the replication of service quality dimensions under the SERVQUAL methodology across a number of different service industries without modifying wording and adjusting the number of items which are unique to certain industrial settings.

Besides criticizing the SERVQUAL model various scholars have given suggestions for the improvement of the model. Figure 2.2 shows some of the major criticisms and suggestions for improvement of the SERVQUAL instrument as suggested by various scholars.

Table 2.2: Weakness of SERVQUAL

Weaknesses	Suggestions for improvement
▪ SERVQUAL treats all 22 items in the scale equally important	• Introduction of weighting (Carman, 1990; Lewes and Mitchell, 1990). • Point allocation across 5 dimensions (Parasuraman, Berry and Zeithaml, 1991)
▪ Negatively worded items create difficulties to respondents (e.g. more time to read, more comprehension mistakes and more likely to attach negative emotional connotations).	• Use of warning to the respondents on the existence of negative/positive wording in the instruction section (Babukus and Boller, 1992) • All negatively worded items to be changed to positively worded items (Parasuraman, Berry and Zeithaml, 1991)
▪ Problems of operationalizing service quality as differential score (e.g. psychological constraint and unstable factor structure)	• Use of performance based SERVPERF (Cronin and Taylor, 1992) • Use of non-differential score by rephrasing each item it the form of "How" (Brown, Chrchill and Peter, 1993)
▪ The word " should' in the expectation statements is unrealistic and causes confusion	• "Should" expectations changed to "would" expectation (Parasuraman, Berry and Berry, 1991)
▪ Separate lists of statements may be less accurate than comparisons made almost the same point in time	• Comparison of expectation and perception measures at the same time using bipolar semantic differential graphical scale (Lewis and Mitchell, 1990) • Use of direct measurement. For example "The visual appeal of XYZ's physical facilities are (much better, better, about the same, worse, much worse) than I expected" (Carman, 1990)
▪ Restricting customers' responses to a point mask subtle variation in their expectations and perceptions	• Use of graphical scale (Lewis and Mitchell, 1990)

Weaknesses	Suggestions for improvement
▪ Adjectives used in the scale cause ambiguity (e.g. How "up-to-date" is it?)	• Use of bipolar semantic differential scale (Lewis and Mitchell, 1990) • Certain items to be modified. For example "up to date" was changed to "modern looking" Parasuraman, Berry and Zeithaml, 1991)
▪ Dimensionlity of 22 item instrument not generic	• Number of items and wording for particular services setting to be modified (Carman, 1990)
▪ Only focuses on the process quality Attributes	• Outcome quality attributes to be included (Rechard and Allaway, 1993)
▪ Questionable reliability, convergent validity and discriminant validity	• Convergent and discriminant validity to be strengthened with additional more stringent evaluation criteria (Babukus and Boller, 1992) • Use of non-difference score to improve reliability and discriminant validity (Brown, Churchill and Peter, 1993)
▪ Problem in dealing with finite ideal point attributes (i.e. one on which customers' ideal point is at a finite level and therefore, performance beyond which displease customers.	• Need to evaluate the models in a situation which there is a high incidence of finite ideal point attributes (Teas, 1993)

There is no doubt that the SERVQUAL model has created a revolution in measuring the customers' perceptions towards the service quality of the provider in various service sectors. Though the model had a major impact on the business and academic communities, but still doubts linger about whether customers routinely assess service quality in terms of Expectations and Perceptions; there are doubts about the utility and appropriateness of the disconfirmation paradigm; there are doubts about the dimensionality of service quality; there are doubts about the universality of the five dimensions of the model. These are serious concerns which are not only significant for users of SERVQUAL but for all those who wish to understand better the concept of service quality. As discussed above, diverse studies using the SERVQUAL model have demonstrated the existence of difficulties resulting from the conceptual or theoretical

component as much as from the empirical component. These criticisms indicate that there is still a need for fundamental research.

The scholars have suggested that customer assessment on continuously provided services may depend solely on performance, thereby suggesting that performance-based measure explains more of the variance in an overall measure of service quality (e.g., Bolton & Drew, 1991; Cronin & Taylor, 1992; Boulding et al., 1993). These findings are consistent with other research that has compared these methods in the scope of service activities, thus confirming that SERVPERF (performance-only) result in more reliable estimations, greater discriminant and convergent validity, greater explained variance, and consequently less bias than the SERVQUAL (Cronin & Taylor, 1992; Parasuraman, Zeithaml, & Berry, 1994; Llusar & Zornoza, 2000). Therefore the most important measure of service quality is the customers' perceptions of the quality of the service that they actually receive.

Whilst its impact in the service quality domain is undeniable, the argument regarding the gaps of SERVQUAL (Parasuraman, Zeithaml & Berry, 1988) and SERVPERF (Cronin & Taylor, 1992) approaches to measure service quality is still unresolved as there are valid issues and propositions. The general view appears to be that, although SERVQUAL and SERVPERF were designed as standard measures of service quality which have cross-industry applicability, it is imperative to view the instruments as basic "framework" that often necessitate modification to fit into the specific application of context. Without doubt the use of these approaches as a means of measuring service quality throughout the marketing (service) sectors may have been tested to some degree of success, but this may not be the case for other service sectors, namely, healthcare particularly the hospitals. Consequently, when seeking an underlying conceptualization of service quality upon which to base a study of healthcare, it was decided to apply the perception paradigm, rather than the disconfirmation model, as it is highly unlikely that a patient would like to admit in a hospital. The choice of the perception paradigm was also potentially more interesting from a hospital perspective, as the literature on service quality has generally been dominated by the application and testing of disconfirmation models. For the

research application considered in the present study was the patient who does not have a prior experience of hospitalization. Thus, to enable the perception of inpatient, SERVPERF approach was used as the basis of the current study.

2.6 Service Quality in Hospitals

The application of SERVQUAL has been widely used in hospital to measure the service quality. This is an emerging trend in measuring service quality in hospitals. Some of the researchers have modified the SERVQUAL dimensions and some other researcher have been developed the new service quality dimensions to fit their study. Lim and Tang (2000) added the dimensions - accessibility/affordability, Tucker and Adams (2001) - caring and outcomes. In the case of Johnston (1995), he sees the need to increase SERVQUAL to 18 dimensions, but Reidenbach and Sandifer-Smallwood (1990) differ in that they suggest that it is necessary to reduce it from ten to seven dimensions; patient confidence, empathy, quality of treatment, waiting time, physical appearance, support services and business aspects.

Apart from these additions and deletions in the detentions of service quality by various scholars, there is another group of those scholars have derived measurement scales, which attempt to quantify the quality of service provided by a hospital. (Hulka et al., 1970; and Fitzpatrick, 1991). Hulka et al. (1970) used statements based on just three dimensions: personal relationship, convenience and professional competence. Thompson (1983) based his work on seven dimensions: tangible, communications, relationships between staff and patients, waiting time, admission and discharge procedures, visiting procedures and religious needs while Baker (1990) concentrated on consultation time, professional care and depth of relationship. Other researchers, Tomes and Ng (1995) conducted content analysis of in-depth interviewing with a total of eight dimensions and renamed the dimension as empathy, understanding of illness, relationship of mutual respect, dignity, food, physical environment and religious needs.

Camilleri and O'Callaghan (1998) consider the dimensions such as professional and technical care, service personalization, price, environment, patient amenities,

accessibility and catering are appropriate in measuring hospital service quality. Andaleeb (1998) on the other hand, limits his set of variables to only five dimensions: communication, cost, facility, competence and demeanor. Jun et al. (1998), conducted focus group interviews, identifies the following 11 dimensions: tangibles, courtesy, reliability, communication, competence, understanding customer, access responsiveness, caring, patient outcomes and collaboration. Another five dimensions identified by Hasin et al. (2001) are communication, responsiveness, courtesy, cost and cleanliness. Yet, Walters and Jones (2001) introduce several elements to be measured in hospital service quality such as security, performance, aesthetics, convenience, economy and reliability. John (1989) recommends four dimensions of health care service quality: curing, caring, access and physical environment. Jabnoun and Chaker (2003) compare the service quality rendered by private to public hospitals in the United Arab Emirates by using ten-dimension instruments: tangibles, accessibility, understanding, courtesy, reliability, security, credibility, responsiveness, communication and competence.

However, the study of the service quality in healthcare in general and in hospitals particularly, has been attracting the attention of scholars across the nations since few years. Here are some of the international and national studies conducted, particularly on service quality in hospitals.

2.6.1 Global Perspective

The study conducted by Babakus Emin and W Glynn Mangold (1992) has empirically evaluates service quality measurement scale i.e. SERVQUAL for its potential usefulness in a hospital service environment. The study conducted in a midsized hospital, located in the southern part of the United States. Active participation of hospital management helped to address practical and user-related aspects of the assessment. The completed expectations and perceptions scales met various criteria for reliability and validity. The author argues that the SERVQUAL is a reliable and valid in the hospital environment for measuring functional service quality. He further argues that the SERVQUAL major contribution to the healthcare industry will be its ability to identify symptoms and to provide a starting point for the examination of underlying problems.

William Boulding et.al (1993) has developed a behavioral process model of perceived service quality. The authors explain that the perceptions of the dimensions of service quality were viewed to be a function of a customer's prior expectation of what will and what should transpire during a service encounter, as well as the customers' most recent contact with the service delivery system. These perceptions of quality dimensions from the basis for a persons' overall quality perception, which in turn predicts the person's intended behaviors. The authors first tested the model with data from a longitudinal laboratory experiment. Then they have developed a method for estimating the model with one-time survey data and re-estimated the model using data collected in a field study. Empirical findings from the two tests of the model indicate, among other things, that the two different types of expectations have opposing effects on the perception of service quality and that service quality perceptions positively affect intended behaviors.

The study conducted by Madhok R, et.al (1992) compares 'Asian' and 'non-Asian patients' experience of and satisfaction with non-clinical aspects of their hospital care, and to evaluate the effect of a subsequent provision of 'Asian' food, the authors undertook interview surveys of discharged adult patients in Middlesbrough. Fifty-two 'Asians' and 52 'non-Asians' matched for sex, age, specialty of admission and hospital reported similar experiences in regard to the amount of information received, the presence of medical students during examination, and satisfaction with privacy and visiting arrangements. The study found that the main differences between the groups related to the receipt of written information in the patients' first language, 'Asian' women's attitudes to examination by male doctors, and provision of and satisfaction with hospital food. The study found that 47 (90 per cent) 'Asians' and 14 (27 per cent) 'non-Asians' required a special diet, but 19 per cent and 86 per cent respectively, received it; and 'Asians' are less satisfied with the food overall. Despite being disadvantage 'Asian' patients seldom complained. The study indentifies that the written information in minority languages, professional interpreters, examination of female patients by women doctors and culturally suitable food are confirmed as priority needs. The authors suggest

that the staff training and community education may ensure successful implementation of policy on health care of ethnic minorities.

Vandamme R, Leunis J., (1993) has conducted a study in a Belgian hospital to develop an appropriate multiple-item scale to measure hospital service quality. The authors discuss discrepancies between SERVQUAL and the dimensions obtained from this study in some detail along with the reliability and validity properties of the scale and makes some critical comments on the SERVQUAL approach with recommendations for future research.

The study conducted by Tomes A.E., & Ng, S.C.P. (1995) explains the development of a multi-item scale for assessing in-patient perceptions of service quality in an NHS trust hospital. The study presents evidence of the high reliability of the scale and its factor structure. Five intangible factors emerge: empathy, relationship of mutual respect, dignity, understanding of illness and religious needs, along with two tangible factors: food and physical environment. Results in a trial hospital indicate that patients' perceptions meet or exceed expectations in respect of four of the seven factors and 22 of the 49 individual variables.

Li, L.X. (1997) has conducted a study on relationship between determinants of hospital quality management and service quality performance. This study empirically explored the relationship between hospital quality management and service quality performance for a sample of US community hospitals using a path analytic model. The study found the strong relationships between hospital service quality performance and the analysis of service process and workforce development. The results of the study demonstrated that health service quality is directly and positively affected by information/process analysis, workforce development and technology leadership. The study found that effectively analyzing service process and patient medical information collected using advanced technology will considerably contribute to hospital service quality.

The study conducted by Camilleri, D. & O'Callaghan, M. (1998) applies the principles behind the SERVQUAL model and uses a Donabedian's framework to compare and contrast Malta's public and private hospital care service quality. Through the identification of 16 service quality indicators and the use of a Likert-type scale, two questionnaires were developed. The first questionnaire measured patient pre-admission expectations for public and private hospital service quality. It also determined the weighted importance given to the different service quality indicators. The second questionnaire measured patient perceptions of provided service quality. The study found that private hospitals are expected to offer a higher quality service, particularly in the "hotel services", but it was the public sector that was exceeding its patients' expectations by the widest margin.

Liu, M., & Lu, X. (2000) have studied the service quality management in China Hospitals. The authors have selected a series of hospitals in China to assess health service quality on seven broad dimensions of service quality in this survey, namely: tangibility; reliability; responsiveness; assurance; empathy, technical quality and medicine quality management. The study described research undertaken to assess the quality of service provided by public and private hospitals in China. The study suggested that the measurement of service quality to be important in evaluating the effectiveness of quality improvement. It also suggested that as management goes through the budgeting process, they should pay close attention to the allocation of quality improvement money. The study found that the hospitals can improve its level quality in those areas which impact on patient's perceptions of service quality the most.

Lim, P.C & Tang, N.K (2000) has conducted a study of patients' expectations and satisfaction in Singapore hospitals. The study examines the expectations and perceptions of patients through SERVQUAL. The findings of the study clearly show that assurance and responsiveness are the critical dimensions of Singapore hospitals' service quality. However, the study found that services, as perceived by patients, failed to meet expectations in all the six dimensions, namely; tangibility, reliability, responsiveness, assurance, empathy and accessibility and affordability.

Andaleeb, S. S. (2000) has conducted a study on service quality of public and private hospitals and compares the quality of services provided by public and private hospitals in Bangladesh. The study found that the market incentives would explain differences in the perceived quality of services provided by the public and private hospitals. It also found that the patient perceptions of service quality and key demographic characteristics are used to predict choice of public or private hospitals.

Andaleeb, S.S. (2001) has conducted the study on service quality perceptions and patient satisfaction in Bangladesh. The author argues that patients' perceptions about health services seem to have been largely ignored by health care providers in developing countries. The author suggests that the patients' voice must begin to play a greater role in the design of health care service delivery processes in the developing countries. The study was patient-centered and identified the service quality factors that are important to patients; it also examined their links to patient satisfaction in the context of Bangladesh hospitals. The author conducted the field survey and evaluated the obtained data collected from patients on several dimensions of perceived service quality, including responsiveness, assurance, communication, discipline, and baksheesh. Using factor analysis and multiple regressions, the study found the significant associations between the five dimensions and patient satisfaction.

The study conducted by Hiidenhovi H et.al (2002) explains the development of service quality in the surgical and medical outpatient departments of a Finnish university hospital. The authors conducted a survey conducted over a three week period using a 12-item questionnaire measuring service quality on a rating scale from 4 to 10 (extremely poor - excellent quality). The data collected from nineteen outpatients and 7679 voluntary patients visiting the outpatient between 1997 and 1999. The questionnaire, which has not been described in use previously, proved to be a good tool enabling systematic access to patient feedback on service quality in outpatient departments. The instrument allowed the detection of the strengths of the service provided by a large organization and long-term trends from the patients' perspective. Patient evaluations are found good and the results

improved year by year. The study found the poorest ratings related to access to information and adherence to appointment times.

The study conducted by Boshoff, C. & Gray, B. (2004) examines whether superior service quality and superior transaction specific customer satisfaction will enhance loyalty among patients in the private health care industry. The study evaluates the relative impact of individual dimensions of service quality and transaction-specific customer satisfaction on two dependent variables, namely loyalty and customer satisfaction, the latter measured as 'overall' or cumulative satisfaction. The study found that the service quality dimensions empathy of nursing staff and assurance impact positively on both loyalty and cumulative satisfaction. The study also found that the customer satisfaction dimensions satisfaction with meals, satisfaction with the nursing staff and satisfaction with fees all impact positively on both loyalty and cumulative satisfaction.

Sungjin Yoo (2005) has studied the service quality of hospitals in Seoul and Busan, Korea. The author examines the determinants of consumer satisfaction with hospitals and clinics using SERVPERF and the differences across institutions. The study found that the major determinants of customer satisfaction at clinics are related to 'tangibles' and 'empathy' dimensions of services and the factor related to 'reliability' is important determinant of customer satisfaction at hospitals. The study further found that the customer satisfaction has a significant effect on word of mouth and patronage for clinics, whereas customer satisfaction has a significant effect on word of mouth but not on patronage for hospitals.

Wisniewski. M., Wisniewski, H., (2005) have conducted the study on service quality in Scottish colposcopy clinic. The study collected data from patients based on SERVQUAL instrument. The authors have obtained, the patient expectations of service on first attendance at the clinic and the perceptions of service received on completion of treatment. Perceptions and expectations are then compared to identify where the largest service gaps exist. The study found that although patient satisfaction with the overall

service provided is high and the largest service quality gap is identified for the reliability of service.

The study conducted by Taner, T., & Antony J., (2006) examines the differences in service quality between public and private hospitals in Turkey. The study applies the SERVQUAL model and compares the care service quality if Turkey's public and private hospital. The study sample contains a total of 200 outpatients. Through the identification of 40 service quality indicators and the use of a Likert-type scale, two questionnaires containing 80-items are developed to measure patients' expectations prior to admission and patient perceptions of providing service quality in public and private hospitals. The study found that inpatients in the private hospitals are more satisfied with the service quality than those in the public hospitals. The results also suggest that inpatients in the private hospitals are more satisfied with doctors, nurses and supportive services than their counterparts in the public hospitals. Finally, the results show that satisfaction with doctors and reasonable costs is the biggest determinants of service quality in the public hospitals.

A study on service quality in private hospitals in turkey is conducted by Çaha Havva (2008). Author explains that more than half of private hospitals along the Turkey are located in Istanbul and it leads, to a high level of competition among private hospitals in the region. The study emphasizes on the consumer satisfaction in the private hospitals and based upon a survey the study used a dynamic model in determining the quality of hospital and the consumer satisfaction.

Nwabueze, U & Mileski, J.P., (2008) have conducted a study on the service quality gaps in the U.K National Health Services. The authors explain that hospitals in the UK had traditionally defined quality as the level of service provided whereas patients defined quality as a service that meets their expectations. The authors further explain that these two definitions highlight a focus difference and result in “service quality gaps.” The study developed a model of service quality gaps with three dimensions, namely; the focus of service organization management, the perceiver of the service, and strategy

implemented, and the model is tested using a 2001 survey of the chief executive of hospitals in England and Wales. The study found that where gaps exist, there is an interconnectedness between the dimensions.

Priporas C.V., et.al. (2008) conducted a study on patient satisfaction measurement for in-hospital services to assess the quality of Greek hospitals by focusing on patients' perceptions. The authors used the patient satisfaction survey approach to measure the hospitals' performance. The study adopted the structured questionnaire and seven hospitals are included in the study. In total, 225 patients are asked to report their judgments on their experience of service quality. The study found that educational status, the type of insurance patients had and the emergency admission significantly affected perceptions of satisfaction. It also found that, males and young people tended to rate satisfaction a little higher than females and older people.

The study conducted by O.V. Mejabi, J.O. Olujide (2008), provides insight into the nature and characteristics of consumer focused service quality, as it pertains to the Nigerian hospital setting. The study identifies a workable measurement scale to determine the underlying service quality dimensions. The instruments had a battery of 39 consumer focused service quality attributes on which respondents rated the hospital on importance and performance. The dimensions are confirmed through factor analysis. The study found the eight dimensions of hospital service quality, namely; resource availability, quality of care, condition of the clinic/ward, condition of facility, quality of food, attitude of doctors and nurses, attitude of non-medical staff and waiting time for service.

Yeilada F & Direktör E (2010) have conducted a study on health care service quality in public and private hospitals and tested the dimensionality of the SERVQUAL instrument in the Northern Cyprus health care industry. The authors have collected the data in two phases from the same sample, which consisted of 806 systematically selected people above the age of eighteen. The authors have used factor analysis and found a three factor solution, namely; reliability-confidence, empathy and tangibles. This result of the study

does not support the five factor model of the original SERVQUAL. Gap analysis shows that the private hospitals have smaller gaps than public hospitals in all three service quality dimensions. Finally, logistic regression findings of the study indicate that while all three dimensions are somewhat influential on patient satisfaction, in public hospitals tangible dimension seems to exert no significant influence on satisfaction.

Irfanet, S.M., & Ijaz, A (2011) have assessed the service quality of private hospitals in Pakistan. The authors evaluate the service quality delivered by the private hospitals in Pakistan based on patient perception from a patient perspective. The study used the SERVQUAL model to find the gap between the patients' expectations and the perceptions. The study found that service quality in private hospitals is meeting patients' satisfactions.

The study of Wu, C.C. (2011) has examined the relationship among hospital brand image, service quality, patient satisfaction, and loyalty. The study collected the primary data from large private hospitals in Taiwan and used to test the relationship. The study found that the positive hospital brand image not only increases patient loyalty directly, but it also improves patient satisfaction through the enhancing of perceived service quality, which in turn increases the re-visit intention of patients. Hospital brand image indeed serves as a lead factor in enhancing service quality, patient satisfaction, and patient loyalty. In addition, the results imply that the path from service quality to patient satisfaction is a key avenue for the impact of hospital brand image on patient loyalty. Consequently, the study proposed that hospital managers should strive to create and maintain the positive hospital brand image in order to enhance service quality, patient satisfaction, and loyalty. The hypothesis, service quality have a positive impact on loyalty is not supported by the study.

Ahmed R., & Samreen's study on assessing the service quality of hospitals in Karachi is based on the SERVQUAL model (2011). The study explores the dimensions of the SERVQUAL model which are the significant determinants of service quality, in terms of patients' satisfaction. The study used the sample of 252 outpatients visiting three selected

hospitals each from the public sector, private sector and semipublic sector. The study used the technique of factor analysis to extract the important factors on the basis of responses obtained from patients. Factor analysis resulted in five factors. The key findings of this study are the regression models obtained from all three hospitals. The study found that these models have the predictors that are statistically significant determinants of the patients' satisfaction for each hospital.

Haque, A., et.al (2012) has conducted a study to develop and test the modified SERVQUAL model to measure Malaysian private healthcare quality. The study used a total of 131 random participants those visit private hospitals in Malaysia. The data analyzed using means, correlations, principal component and exploratory factor analysis to establish the modified SERVQUAL scale's reliability, underlying dimensionality and convergent, discriminant validity. The study used the structural equation modeling technique to do confirmatory factor analysis and test the hypothesized positive interrelationships between customer's perception and customer satisfaction. The study examines the interactions between the key elements of service quality and its impact on customer satisfaction. The statistical results confirm the existence of a very strong relationship between personnel support and customer satisfaction.

The study conducted by Kenneth N. et.al (2012) explores the factors affecting the provision of service quality in the public health sector in Kenya, focusing on employee capability, technology, communication and financial resources. The study reports on empirical evidence drawn from a case study of Kenyatta National Hospital-the largest referral hospital in Eastern & Central Africa. A total of one hundred and three respondents, comprising; sixteen doctors, thirty two nurses, twenty nine clinical officers, fourteen laboratory technologists and twelve pharmacists. The study collected the data using closed and open ended questionnaires. The study found that the low employee's capacity led to a decrease in the provision of service quality public health sector by a factor of 0.981 with while inadequate technology adoption in the provision of health service led to a decrease in the provision of service quality by a factor of 0.917. It is also found that the ineffective communication channels affected the delivery service quality in

the public health sector by a factor of 0.768 while insufficient financial resources resulted to decrease in the provision of health service quality by a factor of 0.671. The study found that the low employees capacity, low technology adoption, ineffective communication channels and insufficient fund affect delivery of service quality to patients in the public health sector affecting health service quality perceptions, patient satisfaction and loyalty.

Zamil, A.M., et, al (2012) conducted a study to measure the impact of health service quality on patient satisfaction in the hospital's of public and private sectors in Jordan. The study used the random sample of inpatients consisted of 450. To determine the impact of health service quality on patient satisfaction the authors used "SERVPERF". The content validity of the measure conducted by committee arbitrators and throughout the multiple use of this measure over the time. The reliability of the measure computed using Cronbach alpha and the result indicated that the internal consistency of the measure was 90%. The result of the study reveals that the service quality has an impact on patient satisfaction in health service quality. It further found that there is a significant statistical difference of the impact of health service quality on patient satisfaction among hospitals of public and private sector. The study also found that the impact of health service quality on patient satisfaction in the private hospital sector is better than that in the public hospital sector.

The study conducted by Kesuma, I.A.W., et, al., (2013) on the service quality influence on patient loyalty has examined the service quality influence on patient loyalty and service quality influence on patient loyalty mediated by customer relationship management. The study collected the data from 100 respondents using the judgment sampling and the data analyzed by using Generalized Structured Component Analysis (GSCA). The results of the study show service quality positively and significantly influenced customer loyalty; Implementation of Customer Relationship Management (CRM) mediated service quality influence on customer loyalty. The study found that when customers of private hospital felt the service quality met their expectation or more, they would be satisfied and loyal.

Untachai Subchat (2013) conducted a study on service quality in Thailand hospital. The author examines the service quality in Thabo Crown Prince Hospital, Nongkhai province. Based on the literature review, the study proposed a service quality model which identified as a one-dimensional construct consisting of five components such as reliability, tangible, response, cost, and empathy. Using a survey design, data collected from 455 patients of hospitals in Nongkhai province. The study found that the second-order factor structure for the service quality was significantly supported. This suggested that patients evaluated the healthcare service quality on five basic dimensions, but they also viewed overall service quality as a higher order factor that captured a meaning common to all dimensions.

Byarugaba J.M., (2013) conducted a study on service quality in Uganda hospitals. The author examines the service quality as experienced by the patients at the Uganda referral hospital. The study used the cross section deign and collected the data from 215 patients from five referral hospitals. Structural Equations Modelling is used to test the theory through confirmatory factor analysis and goodness - of - fit tests. The CFA established that the hypothetical model used to meet the required minimum specifications. The paired sample t-test indicates that a negative Gap 5 exists among patients to referral hospitals in Uganda. The study found that the most important dimensions of patient referred to the hospitals are service reliability and tangibles.

Kazemi, N. et.al., (2013) made an empirical investigation to measure different dimensions of hospital service quality by gap analysis. It measures patients' satisfaction with three dimensions extracted from exploratory factor analysis by principal component analysis method and conformity factor analysis. The study examines the relationship between hospital service quality and patient satisfaction in the context of Iranian hospital services, using structural equation modeling. The study found that the maximum gap in "responsiveness" and the minimum in "assurance". In addition, patients had the most satisfaction in "trust" with the mean of 3.83 followed by "general satisfaction" with the mean of 3.68 and they had the least satisfaction in "acceptance" with the mean of 3.53. Two measurement models are used to measure hospital service quality and patient

satisfaction. The result of structural model found a positive and significant impact of hospital service quality on patient satisfaction (0.463). The study also found a positive and significant relationship between hospital service quality and five dimensions. Furthermore, it is found that patient satisfaction and three dimensions i.e. general satisfaction, trust, and acceptance are associated with each other, significantly and positively.

Anbari, Z., & Tabaraie, Y., (2013) conducted a study to determine the different dimensions of the service quality in hospitals of Iran and evaluates the service quality from the patients' perspective. A cross-sectional study is conducted with the sample size of 385 patients randomly selected from three general teaching hospitals in Arak, Iran. The study used the SERVQUAL questionnaire and examines the gap in quality dimensions based on patients' perceptions and expectations. The results show the gap in quality dimension as: responsiveness -1.80, empathy -1.36, assurance -1.28, reliability -1.69 and tangibles -1.86. The study found that the highest expectation and perception related to the responsiveness dimension and the lowest expectation and perception related to the reliability dimension. The results of the study demonstrated SERVQUAL is a useful instrument to monitor and measure the quality of hospital services in a developing country.

The study conducted by Khan Shahzad (2014) analyzes the antecedents of service quality in two major hospitals located Peshawar region of Pakistan. The study identifies a theoretical framework and collected the sample of 150 patients from Leady Reading Hospital (LRH) and Khyber Teaching Hospital (KTH). The multiple regression technique is used to find the importance of each variable and its contribution towards service quality. The study identifies that cleanness and ambulance service are important service quality dimensions in LRH while patients of KTH considered blood bank and restaurants as major factors of quality service delivery.

The study conducted by Sabir R., I. et. al., (2014) evaluates the fundamentals of service quality in the hospitals of Pakistan i.e. combined military, public & private hospitals. The authors argue that the service quality plays a critical role in government, private, as well

as in the military hospitals of Pakistan. They further argue that the patients' satisfaction is one of the most significant quality factors in healthcare departments. The study measures the service quality by using the SERVQUAL model and collected the data from 300 respondents from five cities of Pakistan i.e. Rawalpindi, Lahore, Kohat, Okara and Sahiwal. Regression, descriptive statistics and reliability analyses using SPSS are conducted to analyze the data. The study found that the service quality of combined military hospitals and private hospitals is more satisfactory than public hospitals. It also found that the patients consider combining military hospitals and private hospitals as a source to meet the requirements patients. The study further found that the environment in public hospitals is not hygienic and healthy and the patients are dissatisfied with behavior of doctors in public hospitals.

2.6.2 Indian Perspective

Apart from the global research on service quality in hospitals, there are studies available in Indian hospitals. The study conducted by Set, N Deshmukh and Vrat, P, (2005) on service quality models, evaluates various service quality models and identifies the issues for future research. The authors have critically examined 19 different service quality models reported in the literature. This review is intended to derive linkage between the models and highlight the area for further research. The study found that the service quality outcome and measurement is dependent on the factors such as type of the service setting, situation, time, need. In addition to this even the customer's expectations towards particular services are also changing with respect to factors like time, increase in the number of encounters with a particular service, competitive environment. Anyhow, the study provides a rich agenda for future research on service quality and it developed a linkage between the different service quality models.

Rohini, R and Mahadevappa B (2006), in their study of service quality in Bangalore hospitals explain that 'in today's highly competitive environment, hospitals are increasingly realizing the need to focus on service quality as a measure to improve their competitive position. Customer based determinants and perceptions of service quality, therefore, play an important role when choosing a hospital'. The authors discuss a service

quality perception study-undertaken in five hospitals located in Bangalore city. The study used the well-documented 'SERVQUAL' as a conceptual framework for understanding service quality delivery of health care services and measured Gap 5 and Gap 1.

Rao, K.D., et.al (2006) has conducted a study to develop a scale to measure in-patient and outpatient perceptions of quality in India and to identify aspects of perceived quality which have large effects on patient satisfaction. The study used the cross-sectional survey and the date collected from primary health centers, community health centers, district hospitals, and female district hospitals in the state of Uttar Pradesh. Internal consistency, validity, and factor structure of the scale are evaluated. The association between patient satisfaction and perceived quality dimensions is examined. The study has developed a 16-item scale having reliability and validity. Five dimensions of perceived quality are identified—medicine availability, medical information, staff behavior, doctor behavior, and hospital infrastructure. The study found that the patient perceptions of quality of public health facilities are slightly better than neutral. Multivariate regression analysis results indicate that for outpatients, doctor behavior has the largest effect on general patient satisfaction followed by medicine availability, hospital infrastructure, staff behavior, and medical information. For inpatients, staff behavior has the largest effect followed by doctor behavior, medicine availability, medical information, and hospital infrastructure.

Acharyulu GVRK and Raja Shekhar B (2007) have conducted a study to measure the service quality in the Indian healthcare industry. The study demonstrates the use of the SERVQUAL model for measuring patients' perceptions of health care quality. The study conducted in three corporate hospitals one from each city of Southern part of India, which include Bangalore, Chennai and Hyderabad. The difference between patient expectations and perceptions are highlighted and the gap analysis was done to identify the service dimensions to enhance the quality of delivery.

Chahal H. (2008) has conducted a study on predicting patient loyalty and service quality relationship in a civil hospital, Ahmadabad, India. The study made an effort to identify

the factors in sustaining customer longevity and analyses the suitability of the customer loyalty concept in the government hospitals. The data collected from 205 indoor patients of four departments, namely; general medicine, orthopedic, pediatrics, obstetrics and gynecology. Inter and intra relationship among the measures of service quality and patient loyalty are analyzed by using statistical tools to draw out inferences. The study found that among the three patient loyalty components, using provider again for the same services is found to be more significant followed by using provider again for different services and recommending providers to others in relation to overall service quality as dependent variable, and beta values are figured out as 0.15, 0.12 and 0.09 respectively. The 35% R^2 value for the service quality – patient loyalty model indicate weak predictive power of this model. However, at the same juncture the study found that no significant difference in the patients' perceptions with respect to patient loyalty and quality and per se, may be concluded that both are identical measures. Alternatively the more satisfied the patients are with the quality of their interactions with staff, the more likely they are going to take treatments for similar and different medical problems and would recommend the provider to their relatives and friends.

The study conducted by Padma P, et al. (2009) measures services quality perceptions of patients in Indian hospitals to determine the dimensions of service quality. The authors explain that the quality has become vital for the healthcare providers to deliver and sustain quality practices in order to get established in the global health scenario. Based on the existing models and the literature on healthcare services, the authors have proposed a framework to conceptualize and measure hospital service quality. A questionnaire is developed for measuring the dimensions of hospital service quality and validated. The study identifies that the infrastructure, personnel quality, process of clinical care, administrative procedures, safety indicators, corporate image, social responsibility and trustworthiness of the hospital are as the dimensions of the hospital service quality.

Prasanna K.S et.al (2009) conducted a study at a Mangalore hospital to assess the consumer satisfaction regarding the services provided in the outpatient department in terms of clinical care, availability of services, waiting time, and cost. A 27-item pre-

tested questionnaire is administered to 100 patients (caretakers in pediatric patients) at the end of their O.P.D visit. The items in the questionnaire referred to the particulars of the patients such as age, sex, occupation, the department requested, lab, and medical stores. While analyzing, they are grouped into categories like availability, clinical care, waiting time, and cost and the responses are expressed in proportions. The study found that the availability of services and clinical care are found to be satisfactory. 81% of the respondents found the communication by the doctor is good and 97% of the respondents are satisfied with the explanation of the disease by the doctor. The study found that the average time required for consulting the doctor was 46.5 ± 20.9 min. But when time spent in pharmacy considered, it is not significantly satisfactory. The cost of the investigation is significantly moderate or high in 97% of the respondents.

Jayesh P. Aagja, Renuka Garg, (2010) has developed a scale for measuring perceived service quality for public hospitals from the user's (patient's) perspective. The study used the sample of 200 respondents who are all patients or patient attendants undergoing treatment at the public hospital in Gujarat. The author has developed a reliable and valid scale called public hospital service quality (PubHosQual) to measure the five dimensions of hospital service quality, namely; admission, medical service, overall service, discharge process, and social responsibility.

Manimaran. S, Sindhya. R, Venkateshwaran. P. S (2010) has conducted the study on patients' expectation and satisfaction in Dindigul hospitals. The study examines the effect of service quality on hospitals with the help of the SERVQUAL Scale framework. An analysis covering 221 patients reveals that there is an overall service quality gap between patients' expectations and perceptions. Thus, the study found that the improvements are required across all the five dimensions, namely, tangibility, reliability, responsiveness, assurance and empathy. In view of this the study offers suggestions to make overall service quality in hospitals more effective and efficient. The overall results of the study have several implications for individual hospitals in Dindigul. This study helps to identify the service gap areas in the hospitals and what these hospitals have to do to reduce the service gap and enhance their services effectively and efficiently.

Ritu Narang, (2010) has conducted a study to indentify the perception of patients towards health care services in Lucknow, India. The 20-item scale administered to 500 users of health care centres comprising a tertiary health centre, a state medical university and two missionary hospitals in Lucknow, India. The scale found to be reliable to a great extent with an overall Cronbach alpha value of 0.74. "Health personnel and practices" and "health care delivery" are found to be statistically significant in impacting the perception. Respondents are relatively less positive on items related to "access to services" and "adequacy of doctors for women". The study found that the tertiary health centre is rated poorer than the medical university and missionary hospitals.

The study of P.G. Ramanujam (2011) on service quality in corporate hospitals examines how well the corporate hospitals in the private sector in Hyderabad are meeting the customers' expectations on the service quality dimensions. The study is limited to only three corporate hospitals in Hyderabad namely, Apollo, Yashoda and CDR and it did not consider the public hospitals, which have been providing the healthcare services to the large population of the society.

A cross-sectional study conducted by Abhijit Chakravarty (2011) used SERVQUAL as the survey instrument. The instrument is validated for use in the hospital environment. In the study, consumer ratings across 22 items of the survey instrument are collected in paired expectation and perception scores and then service quality gaps are identified and statistically analyzed. The study found that the service quality gaps exist across all the five dimensions of the survey instrument, with statistically significant gaps in the dimensions of 'tangibles' and 'responsiveness.' The quality gaps are further validated by a total unweighted SERVQUAL score of (-) 1.63.

The study conducted by Annamalai Solayappan et.al. (2011) on quality measurement for hospital services investigates the perception and expectation of patients regarding hospital services by using the SERVEQUAL gap model. The study used a purposive sample of 300 respondents from leading hospitals in Chennai, Tamilnadu who already have experience in the hospital as inpatients. The major emphasis of the study is to

identify the service quality gaps in a hospital and it found that there is a huge gap on reliability, responsiveness and tangibility services.

The study conducted by Itumalla Ramaiah & Acharyulu GVRK (2011) evaluates patients' perceptions of quality of care given at the outpatient department (OPD) at a private hospital in Kanyakumari District, Tamilnadu. The study conducted the hospital based exit interviews to collect the data. The responses on perceptions of care provider-patient interaction, cost of service, availability of medicines, equipment and health personnel is sought from the participants. The study found that the overall OPD is perceived to have several shortcomings, including lack of responsiveness to patients' needs, delays, unreliable supply of medicines in the hospital, maintaining cleanliness and inadequate availability of diagnostic services. The study identified that the provider-patient interactions, timely services and supply of medicines are the major factors affecting quality of service in the hospital.

The study conducted by Mamta Brahmbhatt et. al., (2011) explores the concept of service quality in a health care setting. Based on modified SERVQUAL variables, the authors tried to identify the effects of each variable to satisfaction. The data collected through field research from 246 patients from public and private hospitals located in Ahmadabad and Gandhinagar region. The study found that the customers' perceptions did not exceed their expectations, as they are dissatisfied with the level of healthcare services rendered by both public and private sector hospitals.

Mekoth, N. et. al., (2012) has conducted a study on service quality in the public sector hospitals and examines the role of service-related processes in generating patient satisfaction. The service-related process is measured based on three dimensions, namely; physician related, clinical staff related and non-clinical staff related. A sample of 209 outpatients from Goa Medical College and Hospital are used for the study. The regression analysis is conducted using SPSS (v. 16) to test the strength of the relationship between process quality (physician, clinical staff, nonclinical staff) and patient satisfaction. The study found that the quality of the physician and that of the clinical support staff

significantly impact patient satisfaction and the process quality associated with the activities of the nonclinical support staff do not significantly predict patient satisfaction.

The study conducted by Arun Kumar. G et.al (2012) on service quality of hospital in Mysore examines the service quality influence on patient loyalty in Apollo hospital of Mysore. The authors used four dimensions, namely; responsiveness, empathy, reliability and tangible of the study. The study based on primary data collected from 185 respondents using a structured questionnaire from Apollo hospital, Mysore. The data is analyzed by using one sample t test and regression analysis. The study found that all the four dimensions: responsiveness, empathy, reliability and tangible are positively related to patient's loyalty.

The study of Sreenivas T, Babu N.S (2012) studies the patient satisfaction in hospitals located in Guntur district, namely; Government General Hospital (GGH), St. Joseph General Hospital (SJGH) and NRI Hospital (NRI). The study collected the data from 120 inpatients from the selected hospitals. It identifies seven dimensions of perceived quality scale with 38 items. The demotions include - admission procedure, physical facilities, diagnostic services, and behaviour of the staff, cleanliness, dietary services and discharge procedure. The study found that the patient satisfaction is high in the case of SJGH and followed by NRI and GGH.

The study conducted by R. Kavitha (2012) compares the patient satisfaction in public and private hospitals viz. Mohan Kumaramangalam Hospital (Public hospital) and Sri Gokulam Hospital (Private hospital) in Salem, Tamilnadu. The sample of 400 inpatients is collected using the SERVQUAL model and also a Donabedian's framework to measure the patients' satisfaction. The study found that the private hospital is performing better in providing service quality and meeting the patient satisfaction according to the needs of the patients.

Sumathi Kumaraswamy' s (2012) study of service quality in health care centre has measures the service quality in corporate and non-corporate health care centers. The

author has used ‘SERVQUAL’ conceptual framework for understanding service quality delivery in health care centers. The study used the sample of 2.00 patients from corporate and non-corporate health care centers located in Madurai city. The study found that the important service quality factors in health care centers are physician behaviour, supportive staff, atmospherics and operational performance. It further found that the corporate health care centres are highly rated then the non-corporate health centers regarding all service quality factors. The author concludes that perception of service quality factors in health care centers has a significant and positive impact on the patients’ perception of the overall performance of the health care centre. The important discriminant service quality factors among the two types of health care centre are atmospherics and supportive staffs. The study suggests the improvement across all service quality factors.

The study conducted by Yogesh Pai. P., Satyanarayana Chary T. (2012) reviews the service quality dimensions established in various studies conducted across the world specifically applied to health care. The authors have proposed a conceptual model to measure the patient perceived service quality in healthcare with ten dimensions, namely; physical environment and infrastructure, personnel quality, image, trustworthiness, support, process of clinical care, communication, relationship, personalization and administrative procedures.

The study conducted by Umath B, et. al (2013) on service quality of Indian hospitals, measures service quality provided by the private hospitals of Ujjain, Dewas and Indore. The study used the structured questionnaire based on 22 statements given by SERVQUAL instrument. The study shows that how SEVQUAL model helps to measure the gaps between service provider and the service receiver in hospitals in India, in general, and Madhya Pradesh state, in particular. The study found that there is a huge gap on reliability, responsiveness and tangibility services in hospitals.

Vivek Sharma (2013) made an attempt to measure the service quality of patients of private hospitals of Indore city. Five hospitals are taken for study and collected the data

from 150 patients based on SERVQUAL tool. The data is analyzed considering age as the independent variable and service quality as dependent variable. The study found that the age is not a determining variable of service quality as per the private hospitals of Indore city are concerned. The study also highlights the difference between perceptions and expectations of the customers regarding the services of the hospitals. The study also found that the expectation of the patients is quite high in case of private hospitals.

The study conducted by Sharmila S and Krishnan J., (2013) provides the current understanding of the patient satisfaction and its determinants and measurement issues. As the empirical setting the study concerns five dimensions of hospitals in Chennai city. The survey instrument in a questionnaire form is designed to achieve the research objectives. A total of 385 questionnaires consisting of 22 items is given to the higher/officers level employees working in different organization out of which only 320 replies are found absolute and useful in the study. A five point scale is used to find out the result. The results of the study show that in private hospitals doctors are genuinely concerned for their patients, doctors and nurses has attentions to care their patients and private hospitals are putting their maximum efforts in order to provide comfort to their patients. The study also identifies some discomfort in the patient service quality of the hospital. At the same time, patients are changing their attitudes towards health-care, becoming much more concerned and demanding of health services. The study reveals the importance of quality evaluation of patient services in few items for their repeated visits and increased patient satisfaction.

Mahapatra Sabita (2013) conducted a comparative study of service quality between private and public hospitals in the capital city of India. The study used SERVQUAL instrument to measure patients' perceptions. An analysis covering 192 patients reveals the gap between patients' expectations and perceptions across public and private hospitals with reference to quality of services delivered on selected parameters. The study used the logistic regression analysis to forecast the probability of a patient to visit a public hospital over private hospital and vice versa. The regression model had a classification accuracy of 94.9%. Preference for a particular hospital across various clusters is identified using

cluster analysis. The findings of the study provide hospital managers an insight for efficient resource allocation and mobilization based on patients' evaluation of service quality delivered by these hospitals.

The recent study conducted by Moorthy K and Vasan S (2014) measures the inpatients perceived service quality for multi-specialty hospitals in Dindigul and Madurai District of Tamil Nadu. The target population of the study is inpatients of multi-specialty and the study a questionnaire method to collect data. The study identifies a medical service, empathy, admission, discharge, physical ambience, equality, infrastructure, tangibility, medical care and availability of medicine are the dimensions of service quality of Hospitals. The study also found that out of ten identified dimensions, only tangibility, admission, equality, medical service, medical care has a significant impact on inpatient satisfaction. The table 2.3 provides some of the studies conducted on service quality in Indian hospital along with the place of the study and the dimensions used in the study.

Table 2.3: Service Quality Dimensions in Hospital-India

Author (s)	Year	Place	Tool/Dimensions
Rohini, R; Mahadevappa B	2006	Bangalore	SERVQUAL
Krishna Dipankar Rao et.al	2006	Uttar Pradesh	Medicine availability, medical information, staff behavior, doctor behavior, and hospital infrastructure
GVRK Acharyulu B.Raja Shekhar	2007	Bangalore, Chennai and Hyderabad	SERVQUAL
Padma P, Rajendran C, L. Prakash Sai,	2009	Conceptual framework	Infrastructure, personnel quality, process of clinical care, administrative procedures, safety indicators, corporate image, social responsibility and trustworthiness of the hospital
KS Prasanna et.al	2009	Mangalore	Clinical care, availability of services, waiting time, and cost
Jayesh P. Aagja, Renuka Garg	2010	Gujarat	Admission, medical service, overall service, discharge process, and social responsibility

Manimaran. S, Sindhya. R, Venkateshwaran.P. S	2010	Dindigul	SERVQUAL
Ritu Narang	2010	Lucknow	Health personnel and practices, health care delivery, access to services and adequacy of doctors for women
P.G. Ramanujam	2011	Hyderabad	SERVQUAL
Abhijit Chakravarty	2011	Pune	SERVQUAL
Annamalai Solayappan et.al.,	2011	Chennai	SERVQUAL
Itumalla Ramaiah, GVRK Acharyulu	2011	Kanyakumari	Health care provider-patient nteraction, cost of service, availability of medicines, equipment and health personnel
Mamta Brahmbhatt et. al	2011	Ahmadabad and Gandhinagar	SERVQUAL
Mekoth, N., 2012	2012	Goa	Physician related, clinical staff related and non-clinical staff related
Arun Kumar. G et.al	2012	Mysore	Responsiveness, empathy, reliability and tangible
T Sreenivas, Nethi Suresh Babu	2012	Guntur	Admission Procedure, Physical Facilities, Diagnostic Services, and Behaviour of the staff, Cleanliness, Dietary Services and Discharge procedure
R. Kavitha	2012	Salem	SERVQUAL
Sumathi Kumaraswamy'	2012	Madurai	physician behaviour, supportive staff, atmospherics and operational performance
Yogesh Pai. P., Satyanarayana Chary T.	2012	Conceptual framework	Physical Environment and Infrastructure, Personnel Quality, Image, Trustworthiness, Support, Process of Clinical Care, Communication, Relationship, Personalization and Administrative Procedures
Bhupesh Umath et. a	2013	Ujjain	SERVQUAL
Vivek Sharma	2013	Indore	SERVQUAL
S. Sharmila, Jayasree Krishnan	2013	Chennai	SERVQUAL
Sabita Mahapatra	2013	Delhi	SERVQUAL
Krishna Moorthy,	2014	Dindigul and	Medical Service, Empathy, Admission,

Srini Vasan		Madurai District of Tamil Nadu	Discharge, Physical Ambience, Equality, Infrastructure, Tangibility, Medical Care and Availability of Medicine

2.7 Satisfaction in Healthcare

The consideration of patients' satisfaction levels and the identification of what factors influence satisfaction is very important for hospital managers. The following section discusses the satisfaction in general and more particularly in hospitals and healthcare management. For some researchers, patient satisfaction is the result of the gap between expected and perceived characteristics of a service (Fitzpatrick and Hopkins 1983). For Woodside et al. (1989) patient satisfaction is a special form of attitude; in other words, it is a post-purchase phenomenon which reflects the extent to which a patient liked or disliked the service after having experienced it. According to Wilton and Nicosia (1986), the most recent models of customer's satisfaction have already stopped handling satisfaction as a static variable, rather conceiving it as an enlarged process or an interaction system around the purchase, use and repurchase acts. This new perspective recognizes that the customer psychological reaction to a product cannot be represented as the result of one only episode, but as a series of activities and continuous reactions along time. In this way, the aggregation of individuals, occasions, stimuli and measurements is a good way to surpass some of the problems related to traditional analysis (Johnson et al. 1995). This aggregation is also useful to reduce the measurement error of the main variables related to satisfaction (Johnson et al. 1995). The Customer Satisfaction Indexes are based on that principle.

According to Anderson and Fornell (2000), a customer satisfaction index measures the quality of goods and services as experienced by those that consume and feel them. It represents the global evaluation of the total experience of purchase and consumption, either actual or anticipated (Fornell 1992; Andersen et al. 1994). This global satisfaction is an important indicator of the past, present and future performance of a business (Anderson et al. 1994). Customer's satisfaction can be analyzed under two different perspectives: as a result or as a process. Satisfaction as a result is concerned with the

nature of satisfaction (Oliver 1997). From the other point of view, satisfaction as a process is essentially concerned with its causes (Oliver 1997; Anderson 1993).

For John (1991), the concept of patient satisfaction includes both approaches. In this way, patients' satisfaction can be viewed as an attitude resulting from the confirmation or disconfirmation of expectations (result perspective) or as a process, resulting from the level of expectations the patient takes to the service experience (process perspective). Thus, it is not only important to know the result of the service experience, but also what are the causes and dimensions that give rise to satisfaction.

Anyhow, the satisfaction formation process is not very consensual either in services, in general, or in healthcare. The conclusions from various studies about customer satisfaction in services found different antecedents in the formation of satisfaction (Anderson and Fornell 2000). In the healthcare context some of these antecedents lose influence. For instance, Taylor and Cronin (1994) found that expectations fail to demonstrate a consistent direct relationship to patient satisfaction. Also, perceived value can be difficult to apply in the healthcare context, since as Peyrot et al. (1993) pointed, usually patients do not know the treatments' real cost, it is difficult for them to evaluate the perceived value of healthcare services. The weakness of some variables in the relationship with satisfaction may be one reason why most of the studies focus, above all, on service quality variables, either functional or technical. However, the most important elements of service quality to each patient may vary depending on the situation each one faces (Mowen, Licata and Mcphail 1993).

2.8 Loyalty in Healthcare

Loyalty is a positive propensity for an organization or brand (Da Silva and Alwi, 2008). In general, loyalty has been considered in various ways, such as positive word-of-mouth, repurchase intention and so on. Dick and Basu (1994) suggested that the concept of loyalty can be conceptualized as a two-dimensional construct, including attitude and behaviour. Subsequently, East et al. (2000) explained that loyalty is closer to a behavioural intention rather than an attitude. On the other hand, Buttle and Burton (2002)

argued that loyalty is probably better seen as an attitude than behaviour. In spite of the arguments about whether loyalty should be conceptualized as attitude, behaviour or both, it is apparent that most studies have conceptualized loyalty as a behavioural intention or behavioural response (Shukla, 2004).

Several studies used re-visit intention as a surrogate for patient loyalty in the health care environment (Boshoff and Gray, 2004; Kim et al., 2008). Patient loyalty may be more appropriate viewed as a behavioural intention. Regardless of whether the discussion focuses on patient loyalty in the health care context or customer loyalty in the general service context, patient loyalty has its own importance in healthcare and hospital settings.

2.9 The relationship between Service quality and Patient satisfaction

Smith and Swinehart (2001) indicate that there is a strong link between service quality and satisfaction. It is also believed that customer service is a prerequisite for customer satisfaction (Newman, Maylor, & Chansarkar, 2001). The effects of service quality on customer satisfaction have been studied in many fields (Amin and Isa, 2008; Caruana, 2002), and have become a one of the important issues in service quality literature. Several studies examined links between service quality and customer satisfaction. They found that high service quality correlates with high customer satisfaction in the general service context (Spreng et al., 1996; Cronin et al., 2000; Oyeniyi and Joachim, 2008). Some researchers and academics viewed that service quality is an antecedent of customer satisfaction (Parasuraman et al., 1985, 1988, 1991; McDougall and Levesque, 1994).

The relationship between service quality and patient satisfaction is also discussed in healthcare and hospital context. . Ware et al. (1978) found that patient satisfaction is affected by the characteristics of the service providers and medical services. Subsequently, Woodside et al. (1989) verifies that patient satisfaction serves as a medium between service quality and behavioural intention. Kim et al. (2008) suggests that medical service quality such as medical doctor, procedure of care, and reliability has a positive influence upon patient satisfaction. Lee et al. (2010) found a positive correlation exists between medical service quality and patient satisfaction. In addition, Yeşilada and

Direktör (2010) found that service quality has a significant positive effect on patient satisfaction in public and private hospitals.

Further, Naidu Aditi (2009) found that the relationship between health care quality and patient satisfaction is significant. A patient is satisfied when hospital service quality matches with their expectations and requirements, consequently, the greater the patient satisfaction (Chahal H and Kumari N, 2010). However, patients have their rights and choice, and if they are not satisfied with their hospital, they have the opportunity to switch to another hospital (Kessler and Mylod, 2011). Furthermore, there is no consensus concerning the relationship between service quality and patient satisfaction in the hospitals, as numerous researchers in the healthcare industry are more focused on measuring technical and functional quality rather than patient satisfaction (Bell, 2004; Gill and White, 2009), and patient satisfaction continues to be measured as a proxy for the patient's assessment of service quality (Turris, 2005).

According to Ahmad Azmi and Norzalita (2008), tangibility, empathy, reliability and responsiveness make up service quality dimensions of hospital services known as "HOSPIQUAL". The study found that HOSPIQUAL affects the patient satisfaction of public and private health care services in Kuala Lumpur and Johore, Malaysia. Research in UAE reveals that perceived health care quality has a positive influence on patient satisfaction (Badri, Attia, & Ustadi, 2009). Navid, Ahmad Fuad and Yuserrie (2010) 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 except for tangible dimension. According to Mpinganjira (2011), overall perceived service quality has a positive relationship with patient satisfaction.

2.10 The relationship between Service Quality and Patient Loyalty

The effect of service quality on behavioral intentions takes on different forms: direct effect, indirect effect through satisfaction, or moderating effect by satisfaction (Falk, Hammerschmidt, & Schepers, 2010; Bou-Llusar et al., 2001; Woodside, Frey, & Daly,

1989). For the direct effect, many studies in different industries have shown that service quality is an antecedent to behavioral intentions (Li, Huang, & Yang, 2011; Boshoff & Gray, 2004; Bou-Llusar et al., 2001); Parasuraman et al., 1985, 1988; Zeithaml et al., 1996).

There are studies which indicated that service quality has a significant positive impact on loyalty. When products or services exceed the expectations of customers, their repurchase intention will increase (Boulding et al., 1993; Cronin et al., 2000). The excellent service quality contributes to customer retention and loyalty (Potluri and Zeleke, 2009).

In health care settings, many evidences have also shown that the direct impact exists (Wu, Liu, & Hsu, 2008; O'Connor, Trinh, & Shewchuk, 2000; Gooding, 1995). In the health care context, Boshoff and Gray (2004) verified a positive relationship between service quality and loyalty as measured by buying intentions.

Wu C.C (2011) has conducted the study with the sample obtained from patients in two large-sized private hospitals located in Taiwan. The study found that the path from service quality to patient satisfaction is a key avenue for the impact of hospital brand image on patient loyalty. Consequently, the study proposed that hospital managers should strive to create and maintain the positive hospital brand image in order to enhance service quality, patient satisfaction, and loyalty. The hypothesis, service quality have a positive impact on loyalty is not supported by the study.

Lonial S et al., (2010) found that service quality directly affects both overall quality of and feelings toward hospital services. Overall quality affects customer repatronage intentions and feelings towards hospital services. However, no significant relationship was found between service quality and repatronage intention Istanbul, Turkey.

2.11 The relationship between Service Quality, Patient Satisfaction and Loyalty

In a review of earlier studies, loyalty can be an outcome of customer satisfaction (Oliver, 1997; Lai et al., 2009). A meta-analysis revealed that a positive significant correlation

between satisfaction and repurchase was found in 15 of the 17 correlations studied (Henard, D. H., & Szymanski, D. M., 2001). The researchers suggested that satisfaction is a construct that mediates the effect of service quality perception on behavioral intentions and other outcomes such as patient trust (Brady & Robertson, 2001; Bigne et al., 2003; Choi et al., 2005; Alrubaiee & Alkaa'id, 2011). The study by Lo, Osman, Ramayah, & Mosahab (2010) found that satisfaction has a mediating effect on the relationships between service quality dimensions and customer loyalty. This result is consistent with studies done by Caruana (2002), Butcher (2001), Ehigie (2006) and Lam and Burton (2006).

In the health care environment, a positive relationship has been noted between patient satisfaction and loyalty (Woodside et al., 1989; Fisk et al., 1990). Furthermore, Kim et al. (2008) examined the correlation between patient satisfaction and re-visit intention in a large-sized hospital, and found that the influence of patient satisfaction on a re-visit intention is significant. Therefore, it is most likely that satisfied patients will be more loyal to their hospital.

Naidu Aditi (2009) explains that Patient satisfaction is a multi-dimensional healthcare construct affected by many variables. Healthcare quality affects patient satisfaction, which in turn influences positive patient behaviours such as loyalty.

Amin, M., & Nasharuddin, S. Z. (2013), found that the five dimensions – admission, medical service, overall service, discharge and social responsibility – are a distinct construct for hospital service quality and each dimension has a significant relationship with hospital service quality. The study also found that the establishment of higher levels of hospital service quality will lead customers to have a high level of satisfaction and behavioural intention.

Kessler, D. P., & Mylod, D. (2011) investigated how patient satisfaction affects the propensity to return to hospital. The results showed that there is a statistically significant link between satisfaction and loyalty. Although, overall, the satisfaction effect is

relatively small, contentment with a certain hospitalization experience may be important. In the hospital industry, for example, Chahal, H., & Kumari, N. (2010), explained that service quality leads to patient satisfaction and patient loyalty. Additionally, Gaur et al. (2011) found a significant relationship between patient satisfaction and loyalty. These findings suggest that when a patient enhances their confidence it will improve the relationship satisfaction with their doctors, and, simultaneously, increase patient loyalty.

Indeed, the most commonly applied for behavioural intention starts from the well-established notion that when patients are highly satisfied with a hospital, they continue dealing with the hospital, and send positive messages to other people (Amin, M., & Nasharuddin, S. Z. (2013).

The study conducted by Khasimah Aliman, N., & Normila Mohamad, W. (2013) confirms that service quality perception is an antecedent of intentions. In addition, tangibility, reliability and assurance are important predictors of satisfaction, and satisfaction has a strong positive relationship with intentions. The study found that service quality drives satisfaction which in turn drives behavioral intentions. The finding also indicates that satisfaction partially mediates the relationship between perceived service quality and behavioral intentions.

The studies found that satisfaction positively affect patient intentional behavior (Bendall-Lyon & Powers, 2004; Otani & Harris, 2004). Elluech, (2008) found satisfied Japanese outpatients are willing to return to the same service provider and to recommend services to families and friends.

Mpingajira (2011) indicated that patients overall satisfaction is a good mediating variable between service quality perceptions and positive behavioral intentions. The relationship also identified by the researchers such as Anderson, Fornell, & Lehmann, 1994; Brady & Robertson, 2001; and Dagger & Sweeney, 2007. Evidence of the mediating effect of satisfaction has been found in many service industries including health care setting (Wu

et al., 2008; Gonzalez, Comesanaa, & Breaa, 2007; Shemwell, Yavas, & Bilgin, 1998; Zeithaml et al., 1996; O'Connor, Shewchuk, & Bowers, 1991).

Alrubaiee, L., & Alkaa'ida, F. (2011), found the mediating effects of patient satisfaction in the association of healthcare quality and patient trust in Jordan hospitals. However, Otani K et al., (2009) argues that satisfying patients' needs is the first step toward having loyal patients, but patients who are merely satisfied often do not come back.

Although many studies have examined the relationship of patient satisfaction, perceived quality services and behavioral intentions internationally, no study that investigates the mentioned relationship in the Malaysia health care industry was found. Thus, this study attempts to examine the mediating effect of customer satisfaction towards the relationship between perception of service quality and behavioral intentions.

2.12 Conceptual Model

Based on the above sources, the study identified the conceptual model. Figure 2.2 depicts the model that is based on service quality literature, where service quality is suggested to lead directly to satisfaction and loyalty. Although the majority of studies indicate the influence of service quality on loyalty through satisfaction (Anderson &Sullivan, 1993; Patterson & Spreng, 1997; Roest & Pieters, 1997) others argue for a direct effect (e.g., Parasuraman, Zeithaml, & Berry, 1988, 1991; Cronin & Taylor, 1992; Boulding et al., 1993; Taylor & Baker, 1994; Zeithaml, Berry & Parasuraman, 1996; Bloemer, et al., 1998). The studies also proved the indirect effect of service quality on loyalty through satisfaction. (e.g. Gotlieb, Grewal, & Brown, 1994; Patterson & Spreng, 1997; Roest & Pieters, 1997).

This model adopts the both perspectives, that the service quality has direct relationship with satisfaction and loyalty and also service quality has an indirect relationship with loyalty through satisfaction. Thus, this model tests the direct effect of In-Patient Service Quality on In-Patient Satisfaction and In-Patient Loyalty and it also tests the indirect effect of In-Patient Service Quality on In-Patient Loyalty.

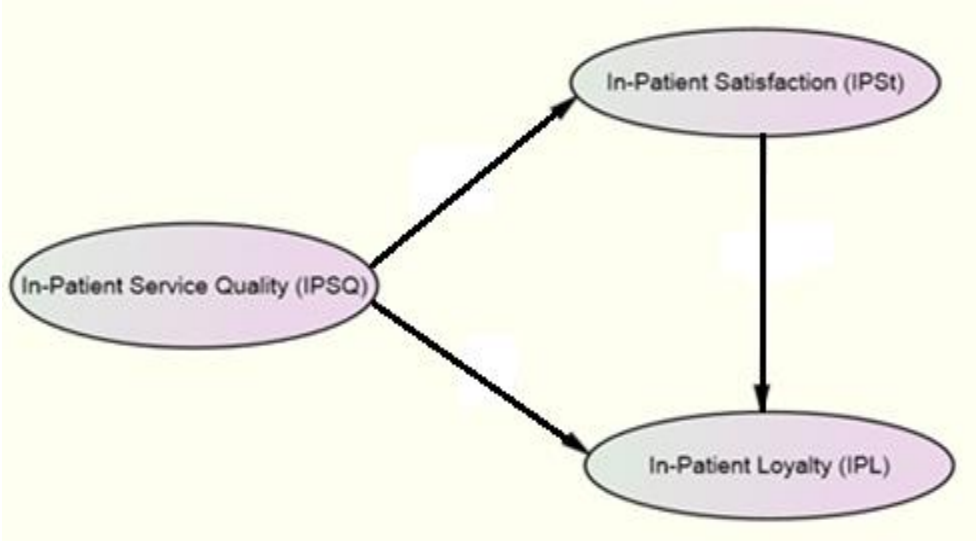

Figure 2.2: Conceptual Model

2.13 Research Gap

From the literature review, we can find that the construct of service quality in hospital has different factor structures in different studies and very little research in this area exists in India. The majority of the studies has been done in the context of a developed country, which cannot be generalized to the Indian context. It has been contended that constructs of service quality that are developed in one culture might not be applicable in another culture (Kettinger et al., 1995; Karatepe et al., 2005). Much of the emphasis in recent research has moved from attempts to adapt SERVQUAL to the development of alternative industry specific measures (Ladhari, 2008). This gap in the literature would seem rational to develop a new measurement scale that incorporates all the aspects of service quality as experienced by the patient.

There is limited empirical research on the concepts of service quality, satisfaction and loyalty, and the relationship between these constructs is not well defined in Indian context. Moreover, service quality models and instruments in healthcare were tending to be based on SERVQUAL and exploratory factor analysis and have not been informed by advances in measurement theory, particularly structural equation models. In spite of a few studies, there remains a dearth of examining the important underlying dimensions

determining the inpatient service quality in hospitals. Hence, the present study made an attempt to develop an instrument for measuring perceived inpatient service quality of the hospital and to examine the relationship between service quality, patient satisfaction and loyalty in the Indian context.

2.15 Summary

From the literature review, it is clear that service quality is a multidimensional construct measured through different factors. The application of generic models in different service sectors has its limitations because each sector has its unique characteristics like hospitals. After the assessment of approaches and limitations in measuring service quality, performance paradigm was found suitable for hospital services. Further, studies reveal that the relationships between the constructs of service quality, satisfaction and loyalty are ambiguous in services marketing literature and they are more complex in hospital services. However, the study developed a conceptual model that covers the combination of paths between the three constructs. In addition, there are hardly studies found in hospital inpatient service quality in the Indian context that has examined the relationships among service quality, satisfaction and loyalty.

Chapter 3

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of the present chapter is to describe the process and the methodology followed in the study. It provides the rationale of the research approach and also describes how this study is performed. The chapter begins with research questions and objectives of the study. Two conceptual models are developed and corresponding hypotheses are proposed based on the relationships between the constructs. The first conceptual model has the relationships between extracted inpatients' service quality factors and overall inpatient service quality. In the second conceptual model, the relationships between inpatients' service quality, inpatient satisfaction and inpatient loyalty are proposed. The hypotheses are proposed to compare the inpatient service quality, satisfaction and loyalty in public and private hospitals.

The chapter also discusses the methodology and designs adopted in the study, followed by a description of the sampling and data collection methods. It explains the criteria on which the hospitals are chosen for the study and how data has collected from the inpatients. The sample distribution among the hospitals is clearly mentioned and justifications are provided. Finally, the chapter concludes with a brief description of each of the statistical tests used in the analysis.

3.2 Research Questions

There is limited empirical research on inpatient service quality in Indian hospitals and relationship between inpatient service quality, inpatient satisfaction and inpatient loyalty constructs. Based on the gaps found in the literature the research questions are raised on critical factors that measure inpatient service quality and the relationships among these constructs. Thus the study makes an attempt to answer the following research questions.

1. What are the variables of inpatient service quality in a hospital?
2. What are the antecedents of the inpatient service quality in a hospital?

3. What is the relationship between inpatient service quality, inpatient satisfaction and inpatient loyalty?
4. Is inpatient service quality has a direct effect on satisfaction and loyalty?
5. Is inpatient service quality has a positive, indirect effect on patient loyalty?

3.3 Objectives of the Study

The broad objective of the study is to develop an inpatient measurement instrument called HospitalQual and examine the relationships between the inpatient service quality, inpatient satisfaction and inpatient loyalty. The objectives of the study are:

1. To develop a HospitalQual theoretical model by identifying the variables and factors which measure inpatient service quality in public and private hospitals
2. To test what extent the inpatient service quality factors are predicting the overall service quality in hospitals
3. To validate the identified inpatient service quality variables and factors by developing a HospitalQual measurement model
4. To examine the relationships between inpatient service quality, inpatient satisfaction and inpatient loyalty using structural equation modeling
5. To compare the inpatient service quality, inpatient satisfaction and inpatient loyalty in public and private hospitals

3.4 Conceptual Models and Hypotheses

In the first attempt the study identifies the critical factors that measure inpatient service quality and examines the effect of these identified factors on the overall inpatient service quality of hospitals, it covers hypotheses from H_1 to H_7 (Figure 3.1).

Seven Hypotheses drawn from the conceptual model 1 (Figure 3.1):

H_1: Medical Service has a significant effect on overall inpatients' service quality

H_2: Nursing Services have a significant effect on overall inpatients' service quality

H_3: Supportive Services have a significant effect on overall inpatients' service quality

H_4: Administrative Services have a significant effect on overall inpatients' service quality

H_5: Patient Safety has a significant effect on overall inpatients' service quality

H_6: Patient Communication has a significant effect on overall inpatients' service quality

H_7: Infrastructure has a significant effect on overall inpatients' service quality

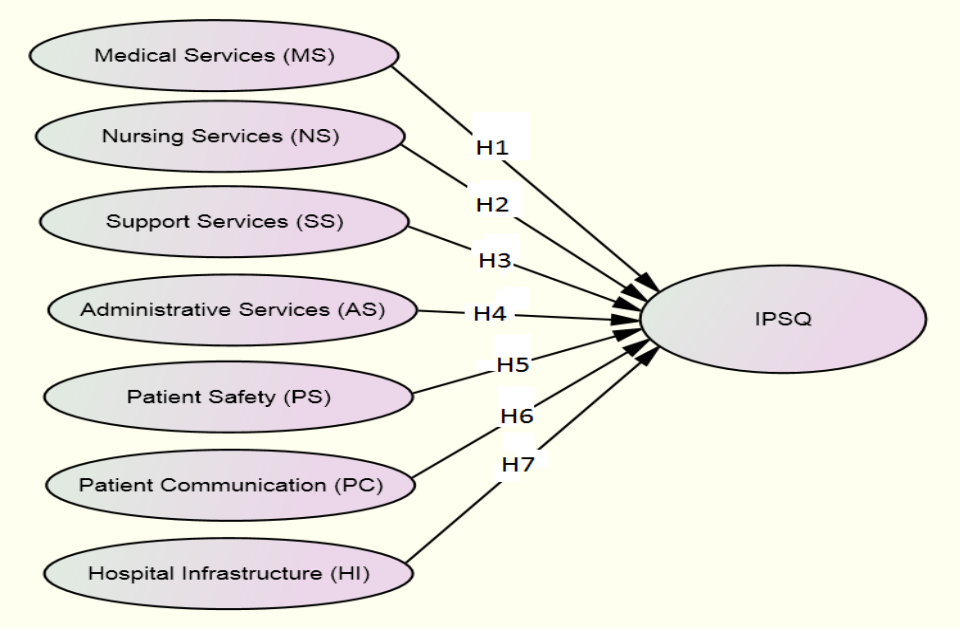

Figure 3.1: Conceptual Model 1

As shown in the conceptual model 2, three hypotheses are formulated in order to examine the relationship between the inpatient service quality and inpatient satisfaction and inpatient loyalty (Figure 3.2):

H_8: In-Patient Service Quality (IPSQ) has a significant effect on In-Patient Satisfaction (IPSt)

H_9: In-Patient Service Quality (IPSQ) has a significant effect on In-Patient Loyalty (IPL)

H_{10}: In-Patient Service Quality (IPSQ) has a significant indirect effect on In-Patient loyalty (IPL)

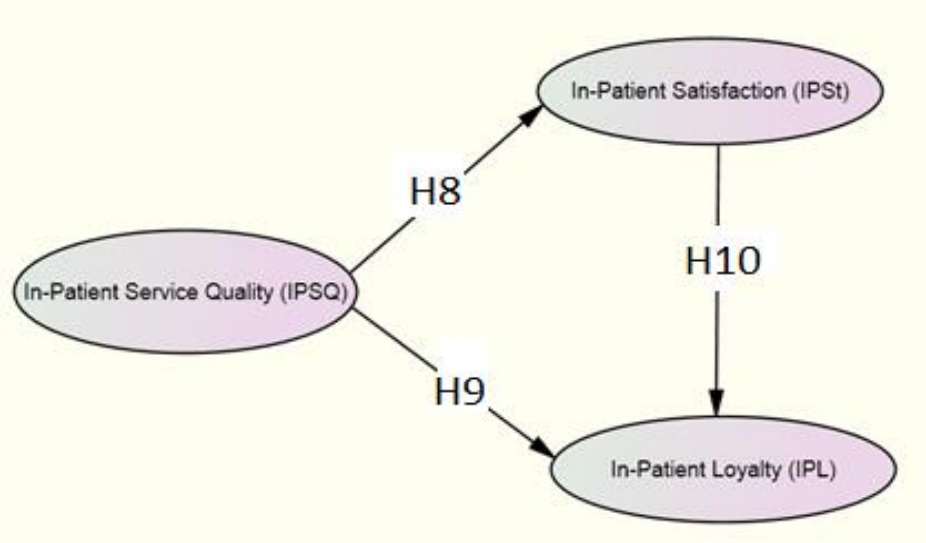

Figure 3.2: Conceptual Model 2

The hypotheses from H_{11} to H_{13} are drawn to compare inpatient service quality, inpatient satisfaction and inpatient loyalty between public and private hospitals. They are:

H_{11}: There is a significant difference between public and private hospitals with regard to Overall In-Patient Service Quality

H_{12}: There is a significant difference between public and private hospitals with regard to In-Patient satisfaction.

$H_{13:}$ There is a significant difference between public and private hospitals with regard to In-Patient Loyalty

3.5 Research Methodology

The methodology plays a vital role in conducting research. Often the methodology is simply defined as quantitative or qualitative, but of utmost importance is that the methodology selected must complement the research questions being examined (De Vaus, 2002). The present study follows a mixed approach to enable some of the benefits of both qualitative and quantitative research approaches. The research initially follows a qualitative approach to gain a clear understanding of the inpatients' perceived quality of services being provided by the hospitals.

In-depth interviews are conducted with inpatients those who had experience with services provided by the hospitals at least by staying three or more days. Public and private hospitals located in Hyderabad, Andhra Pradesh, India visited for the purpose of collecting data. The complex structure and service mix of public and private hospitals would allow for identifying the variables and dimensions of service quality and helps to propose a model. Primary data have gathered through the in depth interviews from inpatients of a public and private hospitals. Since it became impossible to conduct the focus group discussions (FGDs) with the inpatients, the study conducted only the in-depth interviews to identify the inpatient service quality dimensions from the patient's perceptions.

Inpatients' interviews are the focal point during this stage, because of the study intends to identify the service quality dimensions from the perceptions of inpatients. The purposive sampling method is adopted for the sampling of patients.

3.6 Research Design

According to Burns & Bush (2002), research design is a set of advanced decisions that make up the master plan specifying the methods and procedures for collecting and analyzing the needed information. Churchill (1976) explains that research design is the framework or plan for the study, which is used to guide the collection and analysis of research data. A research design therefore ensures that the study is well aligned with the research objectives and it requires the specification of procedures. These procedures involve decisions on what information to generate, method of collecting data, the method of measurement, the determination of what needs to be measured, and the method of analyzing (Guba & Lincoln, 1994). Also, it facilitates the identification of appropriate data that is conducive to resolving the problems.

3.6.1 Explorative - Descriptive Research Designs

The aim of explorative research is to provide insights and to understand the problem confronting the researcher. It is also applied to gain additional insights before an approach can be developed. The information needed is defined only tentative at this

stage, and the research process is characteristically flexible and unstructured. In explorative research, the analysis of primary data is qualitative, with a small and non-representative sample. According to Burns and Bush (2002), exploratory research is appropriate when background information is required about a certain research area, when the concepts and terms need a definition or the problem needs clarifying.

The descriptive research is a type of conclusive research that has, as its major objective the description of something usually characteristics of customers, sales people and organization or market areas. The major difference between exploratory and descriptive research is that the descriptive research is characterized by prior formulation of specific hypotheses, the information needed is clearly defined and the research process is formal and structured. The sample for this research is large and representative. The data analysis is quantitative and the findings of this research are used as a base for decision making. Descriptive research is fine for testing hypotheses about the relationships between variables.

However, considering the objective and characteristics of both exploratory and descriptive research, it is suggested that both the research designs are appropriate approaches for the current research context. The findings of the exploratory research are considered as input for descriptive research. In the present study, the exploratory research identifies the variables to measure the inpatient' perceived service quality in hospitals. The insights gained from the exploratory research are determined through a survey (descriptive research) to test specific hypotheses and examine specific relationships.

3.6.2 The Qualitative - Quantitative Research Approaches

The quantitative, qualitative and mixed research approaches are important methods for conducting an empirical research study. The quantitative research is a way of testing objective theories by examining the relationship between variables; whereas the qualitative research is a means for exploring and understanding the meaning of individuals or groups ascribed to a social or a human problem (Creswell 2009). The mixed research design is the combination the both quantitative and qualitative designs.

Qualitative research focuses on the qualitative understanding of the underlying reasons and motivations. The present study followed a qualitative research approach during the initial stage to identify variables of inpatients' service quality in hospital. Out of the two major methods of qualitative research i.e., in-depth interviews and focused group discussions (FGDs), only in-depth interviews with inpatients were conducted since conducting the FGDs with inpatients did not possible in the hospital setting. Hence, the in-depth interviews are used to explore inpatient perceptions of service quality in hospitals. To capture a wider variety of viewpoints on inpatient service quality, the in-depth interviews with 40 inpatients from two hospitals, including one public and one private (Osmania Hospitals and CARE Hospital, Banjarahills) are conducted. The key themes and words are identified and used to develop a range of variables in relation to the inpatients' perceived service quality.

The initial survey instrument is partially constructed through an analysis of the resultant data collected in the qualitative stage of research and the variables identified in the literature. After the content analysis by the experts, the structured survey instrument is completed and conducted a pilot study from the same hospitals during October - November, 2012. The data from the full scale study is collected by finalized survey instrument in six hospitals, including two hospitals in which the pilot study has conducted. The study collected data during 1st December, 2012 – 31st July, 2013 at various intervals from inpatients of select hospitals. The final data of 1070 completed questionnaires from the inpatients is statistically analyzed and quantified for drawing the conclusions.

However, the present study employs the explorative and descriptive research designs and follows qualitative and quantitative research approach. The findings of the exploratory research are considered as input for descriptive research. The present study relies on deductive reasoning as it draws understanding of wider aspects of service quality of the application of inpatient service quality in hospitals. The study focuses on inpatients' perception of service quality in public and private hospitals and the relationships among

the inpatients' service quality, inpatient satisfaction and inpatient loyalty. The testable hypotheses are drawn and tested.

3.7 Geographical Area of the Study

The study is conducted in Hyderabad city, one of the fast developing cities in the country. It is becoming one of the important healthcare destinies in India. In fact, it has been developing as one of the 'Healthcare Hub' of the country. The healthcare facilities tremendously improved in Hyderabad as several hospitals came into being in the City in the last few years. There are approximately 523 hospitals within the city and the total number of beds in the city is 10000 to 14000. Out of 14035 bed strength of hospitals under DME in A.P, 5637 beds i.e. 40.16% beds are available in Hyderabad. The figure 3.3 shows the area of the study.

Figure 3.3: Area of the Study
Source: www.hyderabadplanet.com

Both public and private hospitals have been catering to the health needs of the people in the state and therefore, the study has chosen the public and private hospitals. The average number of out-patients visiting the hospital per day is around 1,100 and the number of in-patients admitted per day is around 90, for the bed strength of 1000 beds. (Hospital Sector Research, 2010). Both the select public and private hospitals have been providing the healthcare services not only to the patients from Hyderabad but also the patient from different region of the state and county. The table 3.1 provides the total public and private hospitals in Hyderabad based on the report of Directorate of Medical Education, AP. The list of public and private hospitals is provided in appendix I and III.

Table 3. 1: Public and Private Hospitals in Hyderabad

Public Hospitals	12*
Private Hospitals	223**

Source: Directorate of Medical Education, AP
*Public Hospitals, Directorate of Medical Education, AP
http://www.aponline.gov.in/apportal/departments
** Private Hospitals, Directorate of Medical Education, AP
http://dme.ap.nic.in/Recognizedhosolist.pdf

3.8 Population of the Study

The present study focuses on inpatients' service quality in the hospitals as there has been less specific research that explicitly addresses in the context of Indian hospitals. Hence, the patients those who visited first time and avails the health services as inpatients from public and private hospitals are considered as the population of the study.

3.8.1 Target Population

The target population of the study is the first time admitted inpatients those who are about to discharge from the following select hospitals:

- ***Public Hospital:*** Osmanaia Hospital (Public Hospital A), Nizam's Institute of Medical Sciences (Public Hospital B) and Gandhi Hospital (Public Hospital C)
- ***Private Hospital:*** CARE Hospital (Private Hospital A), Krishna Institute of Medical Sciences (Private Hospital B) and Yashoda Hospital (Private Hospital C)

The names of the hospitals are masked in the further analysis in order to maintain the confidentiality of the brand of the hospitals and the data provided by the hospitals. Further, the management of the hospitals is not given the permission to reveal the name and brand. The name and other details of the patients are also not revealed anywhere in the study in order to maintain the confidentiality. The responses provided by the inpatients on service quality, satisfaction and loyalty are aggregated and reported as summary statistics only. Hence, the conclusions made in the present study are only the perceptions of the inpatients, hence cannot be generalized to a particular hospital.

The table 3.2 provides the average inpatient admissions in select hospitals based on the data provided by the management of the hospitals.

. **Table 3.2: Average Inpatient Admission in select Hospital**

Hospital	Beds	Average Annual Admissions
Private Hospital A	430	19,408
Private Hospital B	300	16,000
Private Hospital C	550	20,000
Public Hospital A	1168	50,000
Public Hospital B	1000	31,200
Public Hospital C	1012	60,000

Source: Data provided by the Hospitals Management

Table 3.3 shows the selection criteria of the hospitals for the study. In the context of the current research, six hospitals - three public and three private hospitals located in Hyderabad are selected based on the following criteria:

i. The type of the hospitals i.e. Public and Private,
ii. Hospitals with 300 beds and above, and
iii. Catering to the health needs of the population of different regions of the State.

Table.3.3: Selection Criteria for Hospitals

Category	Bed Strength	Recognition	Catering the Health needs of people from three Geographical Regions
Public	300 and Above	Directorate of Medical Education, AP	Telangana, Andhra and Rayalaseema
Private	300 and Above	Directorate of Medical Education, AP	Telangana, Andhra and Rayalaseema

The select public and private hospitals have been providing different specialties of health services not only to the patient from three regions states but also from different states. The figure 3.4 provides the geographical location of select hospitals of the study.

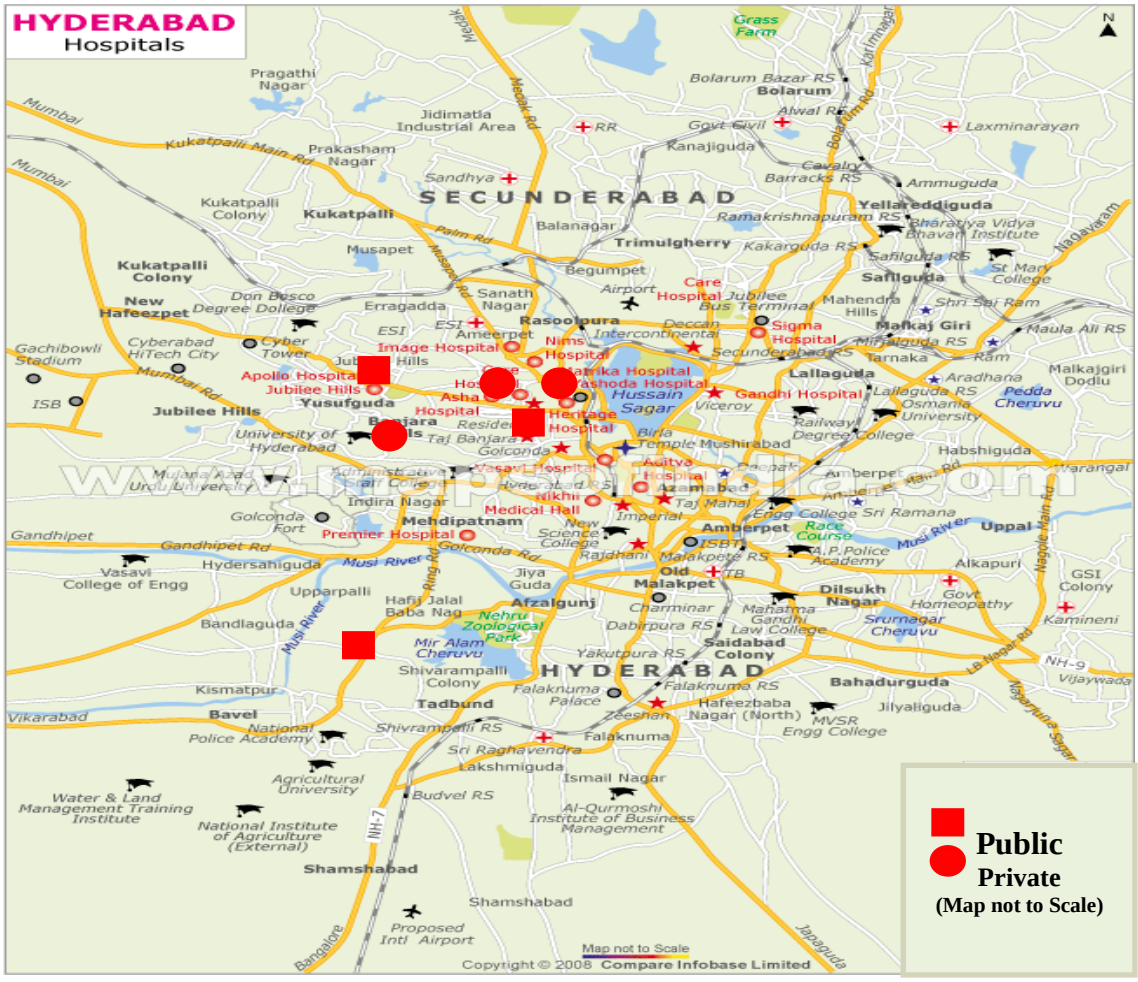

Figure 3.4: Geographical location of select hospitals
Source: www.mapsofindia.com

3.9 Sampling Method

The present study used the purposive sampling method to collect the data. This method is deemed as appropriate because the purpose of the present study is not to provide point and interval estimates of the variables, but to explore the relationships among the variables (Espinoza, 1999). The other sampling methods are less feasible in the context of hospitals where the respondents are inpatient (Jayesh & Renuka, 2010).

3.10 Target Respondents

The target respondents of the study as mentioned earlier, are the inpatients those who admitted first time in select hospitals and about to discharge after the stay of three and more days in a hospital. The inpatients those who came from three regions of the Andhra Pradesh state are only consulted for the study. The rationale for choosing the inpatients with the mentioned criteria is that they would have experienced most of the hospital services during their stay at hospitals and the patients from the three regions would be representing the perceptions of inpatients of Andhra Pradesh.

3.11 Data Collection

The study used both the primary and secondary data and it is mainly based on the primary data collected from the inpatients of select hospitals.

3.11.1 Primary Data

The present study is based on survey research method because the purpose of the research is to gather data regarding perceptions of inpatients' about service quality, satisfaction and loyalty towards hospital services. Two surveys – a pilot survey and main survey – are conducted during the study and purposive sampling method as mentioned previously is applied.

In-depth interviews: The present study used two methods of primary data collection, i.e. In-depth interviews and the structured questionnaire. The study initially conducted in-depth interviews with 40 inpatients from Public Hospital-A and Private Hospital-A to identify the variables of inpatient service quality. The pilot study is conducted to finalize the questionnaire and ensure feasibility for large scale study.

Table 3.4: In-depth interviews

Hospital	Inpatients
Public Hospital-A	20
Private Hospital-B	20

Survey Instrument (Questionnaire): The final data is collected by finalized survey instrument from six select hospitals located in Hyderabad. The questionnaire is comprehensive and the 39 items covers the services provided by the hospitals to the inpatients starting from the admission to the discharge. Five-Point Likert Scale is used in the study as it is recommended for health-care surveys (Elbeck, 1987; Steiber, 1989). All indicators are measured on a five-point Likert scale ranging from 1= strongly disagree to 5= strongly agree.

Table 3.5: Five-Point Likert Scale

1	2	3	4	5
Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree

The latent variable In-Patient Satisfaction (IPSt) with the services provided by the hospital is measured by seven observed variables. It measures the inpatient satisfaction with regards to the medical, nursing, supportive and administrative services and patient safety, communication and hospital infrastructure and overall service quality being provided by the hospital using five-point Likert scale ranging from 1= strongly disagree to 5= strongly agree.

The other latent variable, In-Patient Loyalty (IPL) is evaluated with three observed variables. They are: I prefer to avail the services from this hospital if I need in the future; I suggest this hospital to my family members if they require the services and I refer this hospital to my friends/relatives/colleagues. Again, the five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree was used.

The finalized questionnaire has three sections. The first section of the questionnaire includes 39 variables which are identified by literature review and through in-depth inter views to measure the inpatient service quality in a hospital. The second section two includes the factor level of overall inpatient service quality and latent variables such as Inpatients' Satisfaction (IPSt) and In-Patient Loyalty (IPL) with the service provided by the hospital. An open ended question is included while measuring the overall inpatient service quality, satisfaction and the loyalty. Third section covers demographics of the respondent, such as gender, age, education, occupation, mode of payment, annual income, disease profile and the geographical region of the respondents. This section also includes one open ended question regarding the suggestions to improve the inpatient service quality provided by the hospital (See the Appendix: I - Questionnaire).

3.11.2 Secondary Data: The present study also used the secondary data. It includes the hospital reports and documents of various organizations like Government, WHO, other healthcare organizations. Apart from these, the other secondary sources such as published books and the various articles published in national and international journals are utilized in the study.

3.12 Sample Distribution and Sample Size

The primary data is collected vigorously from six select hospitals located in Hyderabad which includes three public and three private hospitals. A structured questionnaire is designed and distributed to the respondents (inpatients) with an aim to elicit specific information on service quality, satisfaction and loyalty besides the demographic data. As mentioned earlier a non-probability purposive sampling method was used to collect the data from the inpatients of select hospitals.

The study used both approaches such as administering the questionnaire and the self-administering the questionnaire. The researched administered the questionnaire to the inpatients during the data collected from Public Hospital-A and Private Hospital-A. After the administered the questionnaires of 300, the response rate found was 82 percent. Later the 900 questionnaires are administered and distributed to the inpatients in the general

wards and rooms of the remaining hospitals. The objective of the study and specified instructions to fill the questionnaire are explained to the inpatients. This approach saved time and elicited exact opinions from the inpatients. To capture perceptions of the inpatients accurately, researcher actively provided assistance and spent time with the patients, those who required while filling the questionnaire and then they filled in questionnaires are collected immediately. Sufficient care is taken not to influence patients during assistance so that the views and perceptions of patients are recorded without any bias. The researcher also administered the questionnaire in case of few patients, those who expressed the problem of language, physical problem to sit and write and those who are not willing to fill the questionnaire on their own.

As a result of these combined administered and self administered approaches, the response rate is 82.4 per cent and the final valid sample of the study is 1070. The sample distribution and the valid sample collected from the inpatients of each hospital are as shown in table 3.6. The whole valid sample 1070 is divided into two samples: Sample n_1= 246 and Sample n_2= 824. The sample n_1 is used to conduct an exploratory factor analysis to identify the underlying factors of inpatient service quality and n_2= 824 are used for Confirmatory Factor Analysis.

Table 3.6 Sample Distribution and Sample size

Hospitals	Sample distributed	Valid sample	Response rate (%)
Private Hospitals - A	150	123	82
Public Hospital - A	150	123	82
n_1	**300**	**246**	**82**
Private Hospital -B	250	218	87.2
Private Hospital -C	250	194	77.6
Public Hospital - B	250	220	88
Public Hospital - C	250	192	76.8
n_2	**1000**	**824**	**82.4**
Total Sample	**1300**	**1070**	**82.3**

3.13 Sample Justification

The study followed the concept of "Five subjects for one variable" as suggested by Hair et. al., (2008) for the determination of the total number of subjects in the sample of the explorative factor analysis. Since there are 39 attributes identified for the study, the ideal sample size should be 195 (39 X 5= 195). The sample of the present study n_1 = 246 exceeds this requirement by a margin of 51 samples. The present study is followed norms as suggested by Hail et.al. While using the Structural Equation Modeling approach the sample size should consider the following norms based on model complexity and basic measurement model characteristics (Hair et al., 2008).

- SEM models containing five or fewer constructs, each with more than three items (observed variables), and high item communalities (0.6 or higher), can be adequately estimated with samples as small as 100-150.
- If the communalities are lower or the model includes multiple under identified (fewer than 3 items) constructs, then minimum sample sizes of 300 or more are needed to be able to recover population parameters.
- The sample size requirement may exceed 500 when the number of factors is larger than six, some of which use less than three measured items as indicators, and multiple low communalities are present.

The second sample n_2= 824 is used to develop the Structural Equation Model. The sample n_2 is adequate to represent the population of interest and it exceeds the minimum requirement of 500 with the number of factors (six), and some of these factors have fewer than three measured items as indicators (Hair et al., 2008). As shown in the table 3. 7, the n_1 = 246 is also exceeds the sample size, which is used by some of the scholars those who have developed the scale.

Table 3.7: Sample size used by the scale developers

Scholars who developed the Scale	Sample size
Churchill et al., (1974); Saxe and Barton (1982)	201
Parasuraman et al. (1988)	200
Dabholkar et al. (1996)	227
Ahmad Azmi and Norzalita (2008)	210
Badri et al. (2009)	244
Bahia K & Nantel J, (2000)	115

3.14 Demographic Profile of Respondents

The demographics of the respondents such as gender, age, education, occupation, mode of payment, annual income, disease profile and geographical region are as shown in the table 3.8.

Table 3.8 Demographic Profile of the Respondents

Variable	Classification		Frequency	Percentage	Variable	Classification	Frequency	Percentage
Gender	Female		506	47.28	**Annual Income**	< 1 Lakh	233	21.77
	Male		564	52.71		1-2 Lakh	193	18.03
Age	< 18		60	5.6		2-3 Lakh	360	33.64
	19-30		254	23.73		3-4 Lakh	191	17.85
	30 to 50		246	22.99		> 4 Lakh	93	8.69
	50 to 70		278	25.98	**Disease Profile of the Respondents**	Cardiology	216	20.18
	>70		52	4.85		Cardio Thoracic surgery	115	10.74
Education	Illiterate		50	4.67				
	Schooling		254	23.73		Nurology	90	8.41
	Undergraduate		218	19.62		Gastroenterology	154	14.39
	Graduate		319	29.81		Gynaecology	50	4.67
	PG and above		232	21.68		Urology	56	5.23
Occupation	Labour		67	6.26		Nephrology	39	3.64
	Agriculture		134	12.52		Orthopedics	147	13.73
	Private Employee		339	31.68		Nuclear medicine	28	2.61
	Government Employee		153	14.29		General medicine	154	14.39
	Business		367	34.29		Others	21	1.96
Mode of Patient	Cash		386	30.07	**Geographical area of A.P**	Telangana	423	39.53
	Insurance	ESI	60	5.60		Andhra	363	33.92
		CGHS	40	3.73				
		AS	184	17.19		Rayalaseema	284	26.54
		PI	226	21.12				
	Free		174	16.26				

Demographic details of the respondents are collected through the questionnaire. It is found that 47.28% of the inpatients are female and 52.71% are males. Most of the most of the inpatients are in the age group of 19 to 30 followed by the age group of 30 to 50. Educational background of the most of the respondents is graduation and schooling which represents 29.81% and 23.73% respectively. The majority of the respondents are cash patients (30.07%) followed by the Private insurance patients (21.12%). Out of the total respondents, most of them are in the annual income group of 2 to 3 lakh (33.64%) represents a middle class and followed by the income group of below one lakh (21.77%) which represent the below-Poverty-Line (BPL) families. The sample covers the respondents from the various disease profiles such Cardiology, CT, Neurology, Gastroenterology, Gynecology, Urology, Nephrology, Orthopedics, Nuclear Medicine, General Medicine and other categories such as Dialectology, ENT, Plastic surgery and replacements. Out of the total respondents, 39.53% inpatients are from to Telangana, 33.92% from Andhra and 26.54% from Rayalaseema regions of the state of Andhra Pradesh.

3.15 Data Analysis

The collected data is analyzed using multivariate data analysis tests with the help of software tools such as MS Excel, Statistical Package for Social Sciences (SPSS-18) and Analysis of Moment Structures (AMOS- 18). The total valid sample of 1070 is split into two samples: n_1= 246 and n_2= 824. The sample n_1= 246 was used for Exploratory Factor Analysis (EFA) to develop the "HospitalQual" theoretical model to identify the underlying factor structure and to test the hypotheses using multiple regression analysis. The sample n_2 = 824 is used for Confirmatory Factor Analysis (CFA) to develop "HospitalQual" measurement model by validating the indicators and dimensions of theoretical model.

The structural model is developed to test the hypothesized relationships between the constructs of inpatient service quality, inpatient satisfaction and inpatient loyalty using Structural Equation Modeling (SEM). The study also used t test to compare the inpatient

perceived service quality, inpatient satisfaction and inpatient loyalty in public and private hospitals.

The present study apart from using the descriptive statistics, it also used the inferential statistics such as Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), Structural Equation Model (SEM), ANOVA, Multiple Regression Analysis and t-test for analyzing the data.

Before moving to the data analysis chapter, it is worthwhile to mention about the statistical tools that are used in the analysis of the study. The following section provides the brief details of the statistical tools used in the present study.

3.16 Exploratory Factor Analysis

The main purpose of factor analysis is to condense the information contained in a number of original variables into a smaller set of new, composite dimensions or factors with a minimum loss of information. Factor analysis was performed by examining the pattern of correlations (or covariance) between the observed measures. It results in a small set of variables from a large set of variables by creating indexes with variables that measure similar things (conceptually).

Factor Analysis is primarily used for data reduction or structure detection. The aim of structure detection is to examine the underlying (or latent) relationships between the variables. Factor analysis is used to construct a questionnaire to measure an underlying variable. The study used R-type exploratory factor analysis to develop a theoretical factor structure to measure inpatient perceived service quality. The R-type factor analysis is a commonly used technique to analyze a set of variables to identify the dimensions that are latent (not easily observed).

The figure 3.5 presents the research approach for conducting exploratory factor analysis.

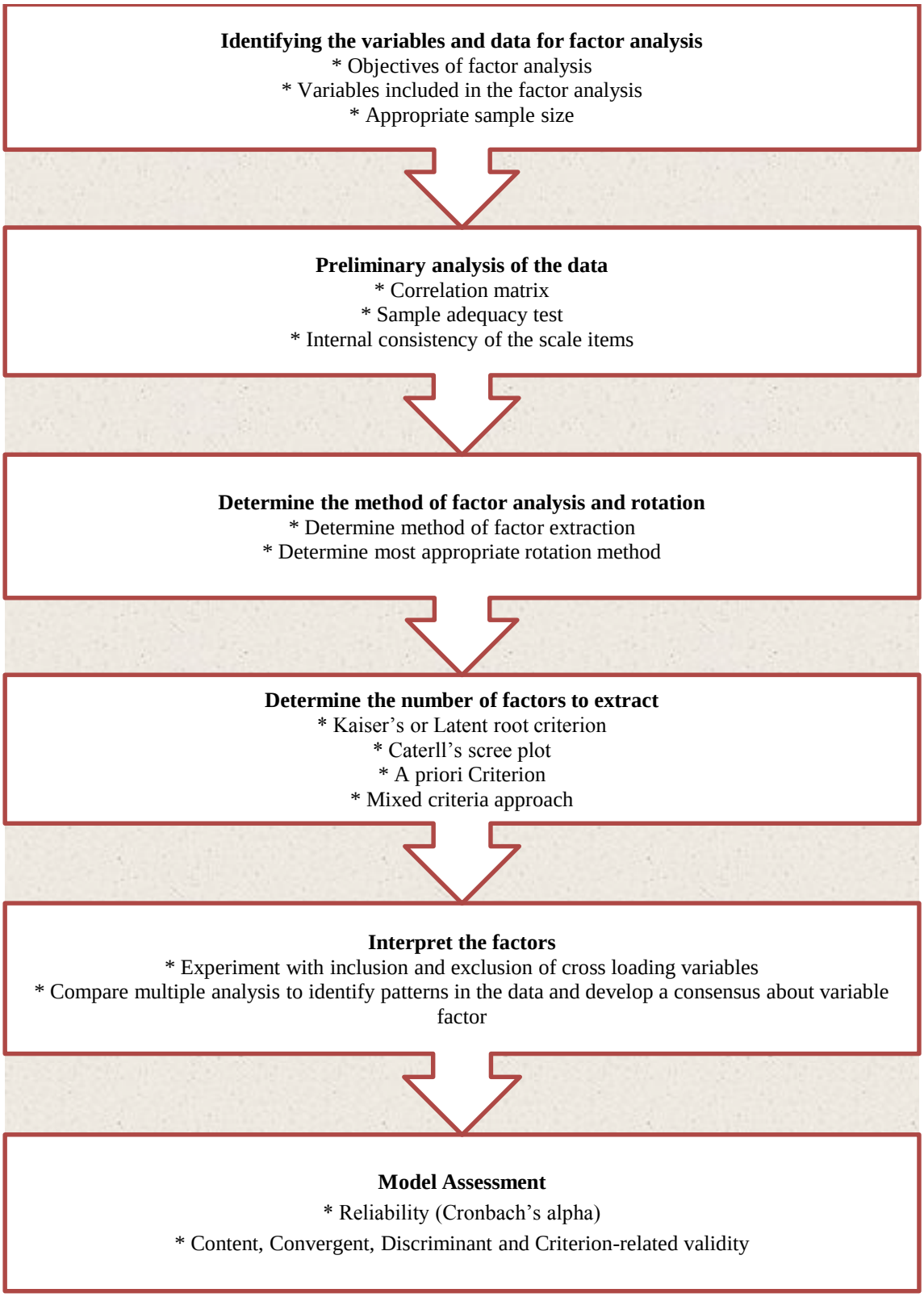

Figure 3.5: Research Approach for Conducting Exploratory Factor Analysis

3.16.1 Factor Rotation Method

The term rotation means exactly what it implies (Hair et al., 2008). There are many different types of rotation methods, but they all try to make each factor highly responsive to a small subset of items. There are two major categories of rotations: "orthogonal rotations" producing uncorrelated factors with the objective of data reduction, and "oblique rotations", producing correlated factors. The best orthogonal rotation is widely believed to be Varimax. It seeks the rotated loadings that maximize the variance of the squared loadings for each factor. The goal is to make some of these loadings as large as possible, and the rest as small as possible in absolute value. This method often produces a clearer and simpler structure which is easy to interpret (Conway & Huffcut, 2003; Field, 2005). Hence the present study used Varimax method to detect factors, each of which is related to a few variables. This setting is considered in the study since it seeks to identify variables to create indexes or new variables without inter-correlated components.

3.16.2 Factor Extraction Method

Kaiser's criterion (Latent root criterion), scree test criterion, and priori criterion are the three commonly used factor extraction methods in social science research.

- **Kaiser's Criterion (Latent-root Criterion):**

  In Kaiser's criterion the only factors having latent roots or eigenvalue greater than 1 are to be retained and all the factors with latent root less than 1 are discarded. The underlying assumption of this criterion is that the eigenvalue 1 represents a substantial amount of variation explained by a factor (Field, 2005 & Pallant J. 2005). The latent root is a commonly used criterion and default measure in SPSS.

- **Scree Test Criterion**

  Another commonly used criterion to extract factors is Cattell's Scree plot. Cattell (1966) advocated this technique based on the level of eigenvalue associated with the factors. The technique is to plot a graph of each eigenvalue (Y-axis) against the factor with which it is associated (X-axis). This graph is called a scree plot. The main principle in this criterion is that each factor has an associated

eigenvalue and it is possible to obtain as many factors as there are variables and the level of variance explained is different for each factor. The cutoff point of the curve is considered to indicate the maximum number of factors to extract. The scree test retains at least one, sometimes two or more factors than latent root criterion (Hair et al., 2008; Cattle, 1966b). The scree plot is a fairly reliable criterion for factor selection when the sample is more than 200 (Stevens J. P. 1992).

- **A priori criterion**

  A priori criterion is another reasonable and simple method to extract factors "when the researchers already know how many factors to extract before undertaking the factor analysis" (Hair, et al., 2008). The study initially followed latent root and screen plot criteria to extract the factors. From the interpretation of factor matrix the factors are fixed by using priori criterion with the support of a review of literature.

The present study followed a hybrid strategy to extract the factors by following Kaiser's criteria (Latent root criterion) and scree test criteria which is commonly used in the social science research to extract the factors. After following the latent root and scree test criteria, the priori criterion was used because the existing studies assert the use of five to seven factors to extract as ideal. It was decided to fix the number of factors at seven.

3.16.3 Interpretation of factor matrix

Interpretation is facilitated by identifying the variables that have large loadings on the same factor. That factor can be interpreted in terms of the variables high loadings on it. The study tested and experimented with inclusion and exclusion of cross loading variables and compared multiple analyses to identify patterns in the data and develop a consensus about variable factor loading.

3.17 Multiple Regression

The multiple regression technique was used to test the relationship between the extracted factors which measure the perceived service quality, and the overall service quality level. The regression model considers the seven extracted factors as the independent variables and the level of overall inpatient service quality as a dependent variable. The summated scales of each dependent variable were calculated by averaging all scale items within the particular factor (Hair et al., 2008). The dependent variable is a five point interval scale which measures the opinion of overall inpatient service quality provided by the hospital. Seven hypotheses were tested by conducting multiple regression analysis. A brief description of the concepts of multiple regression is mentioned below.

R^2 is the proportion of variance in the dependent variable (overall inpatient service quality) which can be explained by the independent variables (medical, nursing, supportive, administrative services, patient safety, patient communication and hospital infrastructure). This is an overall measure of the strength of association and does not reflect the extent to which any particular independent variable is associated with the dependent variable. R is the square root of R^2 and is the correlation between the observed and predicted values of the dependent variable. Adjusted R^2 coefficient of multiple determinations is adjusted for the number of independent variables and the sample size to account for diminishing returns.

The F-statistic indicates the improvement in the outcome (except consideration of mean) coming out of the model should be more than that of the existing inaccuracy that is to say the ratio of improvement to inaccuracy should be more than 1.0. Hence, wherever the model seems to be fitting well with respect to the predictors, the F-statistic must be greater than 1.0.

The concepts of auto-correlation and multi-collinearity have been used in the analysis. In case of auto-correlation the Durbin-Watson's recommended value which is closer to 2.0 gives a better result stating that there is no auto-correlation in the model. The direct measure of multicollinearity is tolerance, defined as the amount of variability of the

selected independent variable not explained by the other independent variables (Hair et al., 2008). A high tolerance value (> 0.2) means a small degree of multicollinearity, In other words, the independent variables do not collectively have any substantial amount of shared variance. The second measure of multicollinearity is the Variance Inflation Factor (VIF). The VIF is directly related to the tolerance value which is calculated simply as the inverse of the tolerance value (i.e., VIF= 1/ tolerance value). The VIF must be less than 5; else there is possibility of collinearity. But in social science research in some cases this is acceptable up to 10 (Gaur & Gaur, 2009).

3.18 Confirmatory Factor Analysis (CFA)

A Confirmatory Factor Analysis, using AMOS, was then undertaken to test and confirm the developed theoretical factor structure. The figure 3.6 presents the process of structural equation modeling comprises both developments of measurement model and structural model. The constructs were defined and measured, and the interrelationships among constructs were also specified based on the theory. The measurement theory specifies how the constructs are represented. The sample n_2 = 824 is used to develop a HospitalQual measurement model which contains the development of First and Second-order Measurement Models.

3.18.1 First-order Measurement Model

The first-order measurement model was developed by confirming the seven factor structure. The process of validating the model comprises various steps starting from preliminary analysis of the data followed by individual CFA for each construct and development of the overall measurement model. The number of fit indices was obtained to measure the model fit. The validity of the model was assessed by the convergent, discriminant and criterion validity tests.

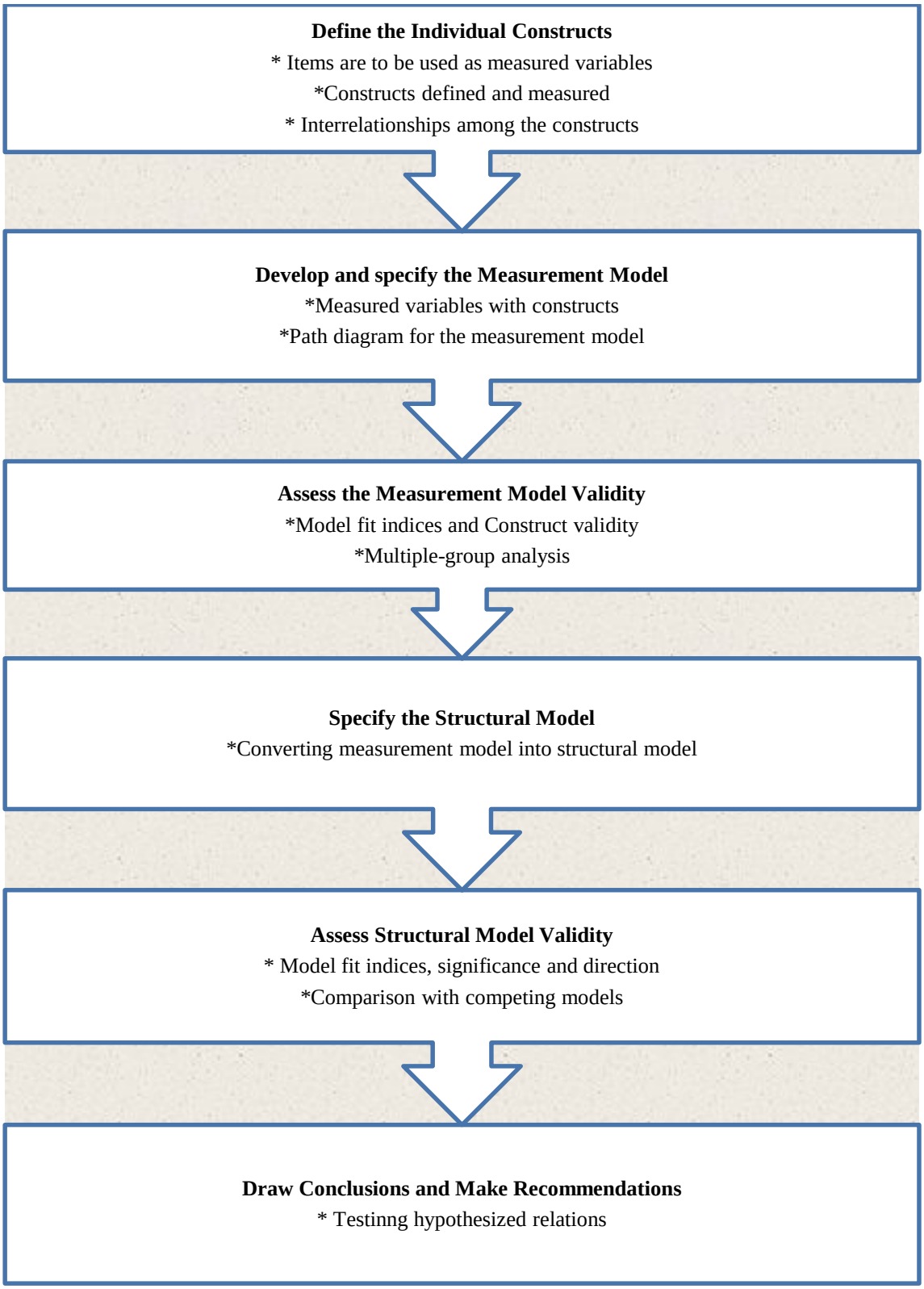

Figure 3.6: The Process for Structural Equation Modeling

3.18.2 Second-order Measurement Model

The second-order factor models are widely used in psychology and social science domains, where a single construct is measured by various related variables. "Second-order measurement models are most typically applicable in research contexts in which measurement instruments assess several related constructs, each of which is measured by multiple items" (Chen, Sousa & West, 2005). The purpose of the second-order measurement model is to integrate all the service quality factors into one second-order factor that helps to study the hypotheses as well as for future adoption in structural modeling and provide simplification of the interpretation of complex models (Byrne, 2010 and Chen, Sousa & West, 2005). In the present study, the second-order measurement model was developed by considering the seven factors as first-order factors and integrated into one second-order factor called In-Patient Service Quality (IPSQ). The fit indices, reliability and validity of the second-order model are assessed.

3.19 Measurement Model Fit Indices

The validity of the measurement model depends on the results of model fit indices. Most Structural Equation Modeling (SEM) programs provide multiple fit indices; however the following are the most commonly used fit indices which were used in the present study:

The Absolute fit indices directly measure how well the specified model reproduces the observed or sample data. Commonly used Absolute-of-Fit measures are Chi-square- $\chi 2$, Goodness-of-fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), and the Root Mean Square Error of Approximation (RMSEA).

Actual assessment of goodness of fit with a chi-square ($\chi 2$) value alone is complicated by several factors like sample size and number of observed variables. The Chi-square value increases with sample size even when the differences between observed and estimated matrices are minimal. Similar results are obtained in the case of a large number of observed variables (Hair et al., 2008). Hence, chi-square GOI test alone is difficult to use for model fit, therefore other alternative measures of fit were assessed. In this research

the Chi-square ($\chi 2$) statistic is reported since it is accepted as a fundamental measure of fit (Hu & Bentler, 1995).

The Goodness-of-fit Index (GFI) is an early attempt to produce a fit statistic that was less sensitive to sample size (Hair et al., 2008). The study of Hu & Bentler (1995) and Marsh et al., (1988) suggest that GFI performs better than the other absolute fit indices. Although theoretically a negative result is possible if the hypothesized model is worse fit than the null model. The results for the GFI are normally in the range of zero to one with higher values indicating a better fit (Byrne, 2010). A GFI of above 0.90 is generally accepted as indicative of a good fit (Hair et al., 2008; Hu & Bentler, 1995).

The Adjusted Goodness-of Fit Index (AGFI) is similar to the GFI but differs in the fact that it makes adjustment for the number of degrees of freedom in the specified model. The result will normally range between zero and one with higher values indicating a better fit (Byrne, 2010). As with the GFI, values above 0.90 are seen as acceptable (Hair et al., 2008). But AGFI values are typically lower than GFI values in proportion to model complexity.

Root Mean Square Error of Approximation (RMSEA) represents how well a model fits a population, not just a sample used for estimation. It explicitly tries to correct for both model complexity and sample size (Hair et al., 2008). Lower RMSEA values indicate better fit. A RMSEA value between 0.05 and 0.10 is reasonable and below 0.05 is a good fit.

In contrast to the absolute fit indices, the incremental fit indices assess how well a specified hypothesized model fits relative to some alternative baseline model that is commonly referred as “null model”. The null model assumes all observed variables are uncorrelated (Byrne, 2010; Hair et al., 2008). This class of fit indices represents the improvement in fit by the specification of related multi-item constructs. These are also sometimes referred to as comparative fit indices for obvious reasons (Hair et al., 2008).

The Normed Fit Index (NFI) is recognized as the principal incremental fit index, but has been criticized for underestimating fit with small sample sizes. Comparative Fit Index (CFI) is an improved version of the Normed Fit Index (NFI). CFI is derived from NFI in an effort to include model complexity in a fit measure. Tucker Lewis Index (TLI) is conceptually similar to CFI. TLI also involves a mathematical comparison of a specified theoretical measurement model and baseline null model. Relative Fit Index (RFI) also compares the observed fit resulting from testing a specified model to that of a null model. The results for all the incremental fit indices range from 0 to 1 with larger results indicating a better fit. A result above 0.90 is indicative of a good fit (Byrne, 2010; Hair et al., 2008).

3.20 Validity of Measurement Model

Validity is defined as the extent to which it measures what is intended to be measured. According to Joppe (2000), "Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are." Wainer & Braun (1998) describe the validity in quantitative research as "construct validity." Construct validity is the extent to which a set of measured items actually reflects the theoretical latent construct those items are designed to measure (Hair et al., 2008). Construct validity is measured by establishing the face validity, convergent validity, discriminant validity and nomological validity.

3.20.1 Face (Content) Validity

The face (content) validity is not measured numerically, but through general agreement among the respondents and experts that the measurement instrument covered all aspects of the variable being measured (Saraph, Benson, & Schroeder, 1989). Given that the questionnaire had been appropriately designed through a comprehensive review of relevant literature and then fined-tuned based on the suggestions from various experts, the face validity of the instrument was ensured (Kaplan & Sacuzzo, 1993).

3.20.2 Convergent Validity

Convergent validity refers to the items that are indicators of a specific construct which should converge or share a high proportion of variance in common (Hair et al., 2008). There are three ways to estimate the relative amount of convergent validity among the item measures: Factor loadings, Variance Extracted (VE) and Construct Reliability (CR) (Fornell & Lacker, 1981; Hair et al., 2008). Significant and high factor loadings would indicate that they converge on some common point. The standardized loadings estimates should be 0.5 or higher, and ideally 0.7 or higher. The average variance extracted (AVE) among the set of construct items is a summary indicator of convergence. The value of AVE can be calculated using standardized loadings:

The formula for measuring Average Variance Extracted is:

$$VE = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$

The λ represents the standardized factor loadings and *i* is the number of items. So for *n* items, VE is calculated as the total of all squared standardized factor loadings divided by the number of items. A good rule of thumb is an AVE of 0.5 or higher indicates adequate convergent validity. The AVE of less than 0.5 indicates that on average, there is more error remaining in the items than there is variance explained by the latent factor structure imposed on the measure.

Construct Reliability (CR) is also an indicator of convergent validity. Construct reliability is computed from the squared sum of factor loadings (λ_i) for each construct and the sum of the error variance terms for a construct (δi) using the following formula.

$$CR = \frac{(\sum_{i=1}^{n} \lambda_i)^2}{(\sum_{i=1}^{n} \lambda_i)^2 + (\sum_{i=1}^{n} \delta_i)}$$

Note: error variance is also referred to as delta.

The rule of thumb for a construct reliability estimate is that 0.7 or higher suggests good reliability. Reliability between 0.6 and 0.7 may be acceptable provided that other indicators of a model's construct validity are good. High construct reliability indicates that internal consistency exists, which means that all the measures are consistently represented something.

3.20.3 Discriminant Validity

Discriminant validity is the extent to which a construct is truly distinct from other constructs (i.e., unidimensional). High discriminant validity provides evidence that a construct is unique and captures some phenomena other measures do not. Discriminant validity can be assessed by comparing the variance extracted (AVE) estimates for each factor with the Squared Intern Construct correlations (SIC) associated with that factor. The variance extracted should be greater than the squared correlation estimate. The logic here is based on the idea that a latent construct should explain its item measures better than it explains another construct.

3.20.4 Nomological Validity

Nomological validity is tested by examining whether the correlations between the constructs in the measurement model make sense. The construct correlations are used to assess this and the positive and significant correlations between the constructs indicate nomological validity.

3.21 Structural Equation Modeling (SEM)

Structural Equation Modeling (SEM), also known as latent variable analysis (Baumgartner & Homburg, 1996; Hair et al., 2008), is developed from multiple regression analysis to combine a series of multiple equations within one structural model (Hair et al., 2008). A structural theory is a conceptual representation of the relationships between constructs. A measurement model typically contains all the constructs with non-causal or correlational relationships among them. Once the validity of the measurement model has been established, then it can be converted into a structural model. The structural model applies the structural theory by specifying which constructs are related

to each other and the nature of each relationship. The approach simultaneously runs several multiple regression equations. The present study used the SEM to combine the relationships investigated into one broad model that integrates the relationships in the pathway from Inpatient service quality to satisfaction and loyalty.

3.21.1 Structural Model Validity

Assessing the validity of the structural model involves examining the fit and testing structural relationships and hypotheses.

3.21.2 Assessing Structural Model Fit

The fit of the structural model is examined as is the CFA model. As discussed earlier, more than one fit statistic is used to assess the fit. It was recommended that one absolute index, one incremental index and one badness-of-fit index together with low value of model $\chi 2$ be used (Hair et al., 2008). Another way to assess the model fit of the structural model is by comparing the CFA fit and structural fit. The CFA fit provides a useful baseline to assess the structural or theoretical fit. The closer the fit of a structural model is for the fit of a measurement model, the better.

3.21.3 Testing Hypothesized Relationships

In SEM, the theoretical relationships are generally transformed into hypotheses that can be empirically tested. The individual parameter estimates against the corresponding predictions or paths represents a specific hypothesis. Therefore, the dependence relationship estimates must be evaluated. The results must be statistically significant and in the predicted direction of path with positive or negative relationship.

3.22 Summary

The research was exploratory and descriptive in nature, and addresses the research questions about the structure and antecedent of inpatient perceived service quality and relationships between inpatient perceived service quality, inpatient satisfaction and inpatient loyalty. Two conceptual models were developed and total **13** hypotheses were proposed. The survey method was used to collect data from six select hospitals, which

include three hospitals from public and three from the private sector. The purposive sampling method was applied to collect the data from the respondents (inpatients). The brief description of statistical tools used in the data analysis is discussed. The analysis of the data involves four main stages: (1) Exploratory Factor Analysis to identify the theoretical factor structure and Multiple Regression analysis to test the hypothesized relationships between the inpatient service quality factors and level of overall inpatient service quality (2) Development of HospitalQual measurement model (3) Development of Structural Model using the approach of Structural Equation Modeling (SEM) and (4) comparison of Inpatient service quality, satisfaction and loyalty in public and private hospitals. The hypothesized relationships between the inpatient service quality, satisfaction and loyalty were tested using structural equation modeling. The next chapter provides the data analysis of the study.

Chapter 4

DATA ANALYSIS

The present chapter deals with the data analysis. It contains the development of HospitalQual theoretical and measurement models. The chapter also examines the relationships among In-Patient Perceived Service Quality (IPSQ), In-Patient Satisfaction (IPSt) and In-Patient Loyalty (IPL) by developing a structural model which adds empirical evidence to the existing field of knowledge. It further compares the inpatient service quality, satisfaction and loyalty in private and public hospitals. Apart from the descriptive statistics, the inferential statistical tools such as factor analysis, multiple regression, ANOVA, Structural Equation Modeling and t test are performed for data analysis using the statistical packages such as SPSS 18.0 and AMOS.

The present chapter is divided into four sections.

- In the first section, the sample $n_1 = 246$ is used to develop a HosptalQual theoretical model by identifying the critical factors that measure inpatient perceived service quality in hospitals using Exploratory Factor Analysis (EFA). It is followed by testing of proposed hypotheses using multiple regression analysis.
- In the second section, the sample $n_2 = 824$ is used to develop a HospitalQual measurement model using Confirmatory Factor Analysis (CFA). It involves development of First and Second-order Measurement Models.
- Third section deals with the development of a structural model which tests the hypothesized relationship among the constructs of Inpatients Service Quality, Inpatient Satisfaction and Loyalty using Structural Equation Modeling (SEM).
- Finally, the fourth section provides the comparison of Inpatients' Perceived Service Quality, Satisfaction and Loyalty in public and private hospitals. It also includes the testing of proposed hypotheses using multiple regression analysis and t test.

As shown in the figure 4.1, the first three sections are consecutive where the output of the first section HospitalQual theoretical model is an input for the second section which tests

and confirms using CFA that results in the HospitalQual measurement model. In the same way, the finalized measurement model is considered as input for developing structural model along with other CFA models of constructs and followed by the comparison of service quality, satisfaction and loyalty in public and private hospitals.

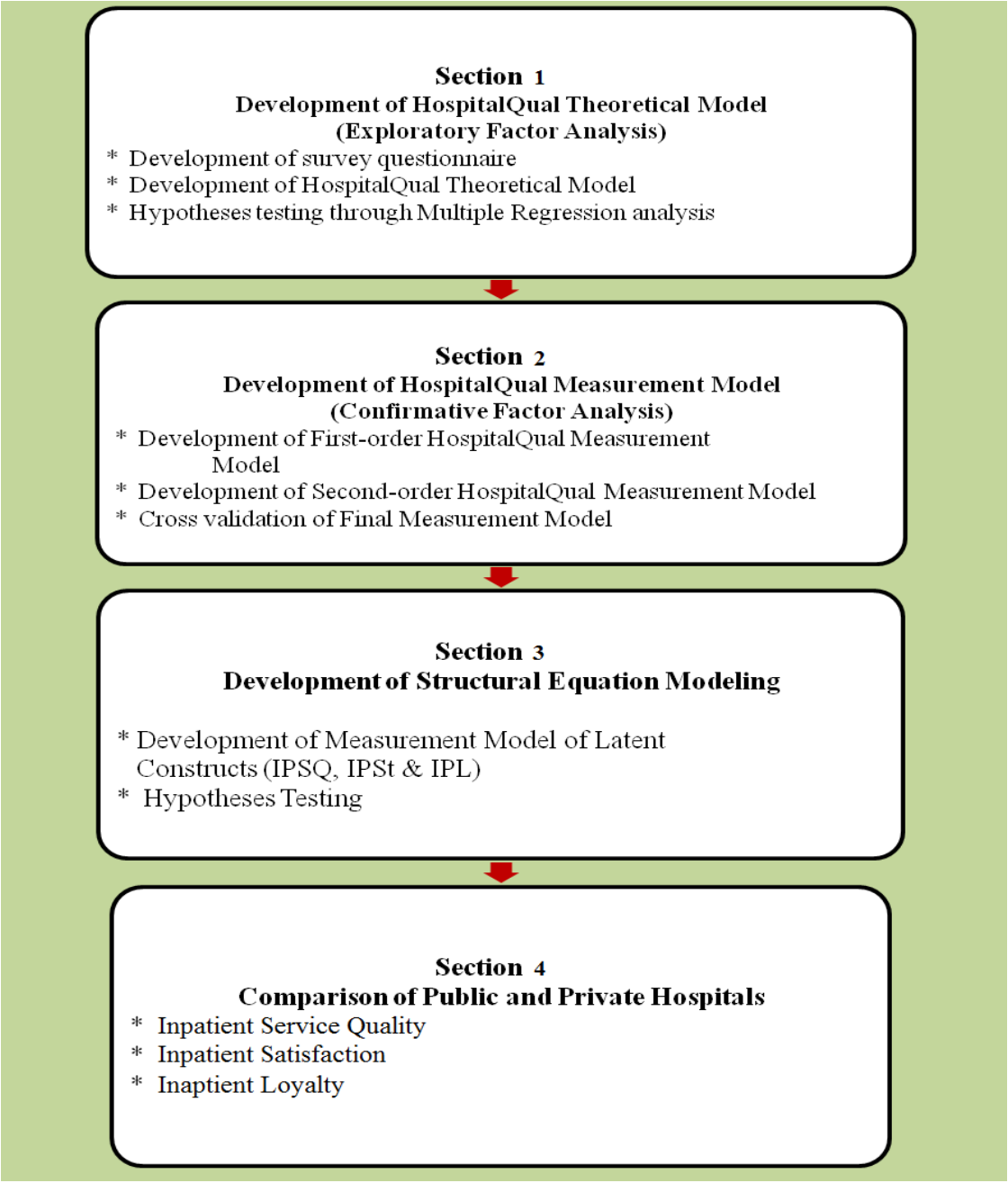

Figure 4.1: Sections of Data Analysis

SECTION 1
DEVELOPMENT OF HospitalQual THEORETICAL MODEL

The first section of data analysis describes the process of identification of critical factors to measure inpatient service quality and development of the HospitalQual theoretical model. The survey instrument is named as HospitalQual after the factor analysis, in consultation with experts from both the healthcare industry and academia. It is developed based on generally accepted psychological principles of instrument design. (Likert, 1967; Nunnally, 1970; Gilbert & Churchill, 1979; Hinkin, 1998). Ten steps involved in the process of development of the HospitalQual theoretical model as shown in Figure 4.2. Out of total steps, the steps 1, 2 and 3 refer to identification of pool of variables of inpatient service quality through literature review, expert opinions, in-depth interviews and initial selection of these items. Steps 4 and 5 refer to pre-testing of the instrument and finalization of the measurement items.

The output of step 5 is considered as a measurement instrument (questionnaire) for the data collection task in step 6. In step 7, the preliminary analysis of the data is conducted through descriptive statistics, Cronbach's alpha, sample adequacy and inter-correlation matrix. The step 8 refers to the process and results of exploratory factor analysis and step 9 demonstrates the reliability and validity measures of HospitalQual theoretical model. Finally, the study conducted multiple regression analysis in step 10, to test the predicted level of seven extracted factors on the level of overall inpatient service quality.

4.1 Development of Survey Instrument

4.1.1 Literature Review

In the first step, the inpatient service quality variables are derived from the existing literature. The process of identification and synthesis of critical variables for inpatient service quality in hospital have been prescribed by eminent service quality practitioners and researchers. Originally fifty one variables are acknowledged from the previous literature and through the qualitative research process as shown in the table 4.1.

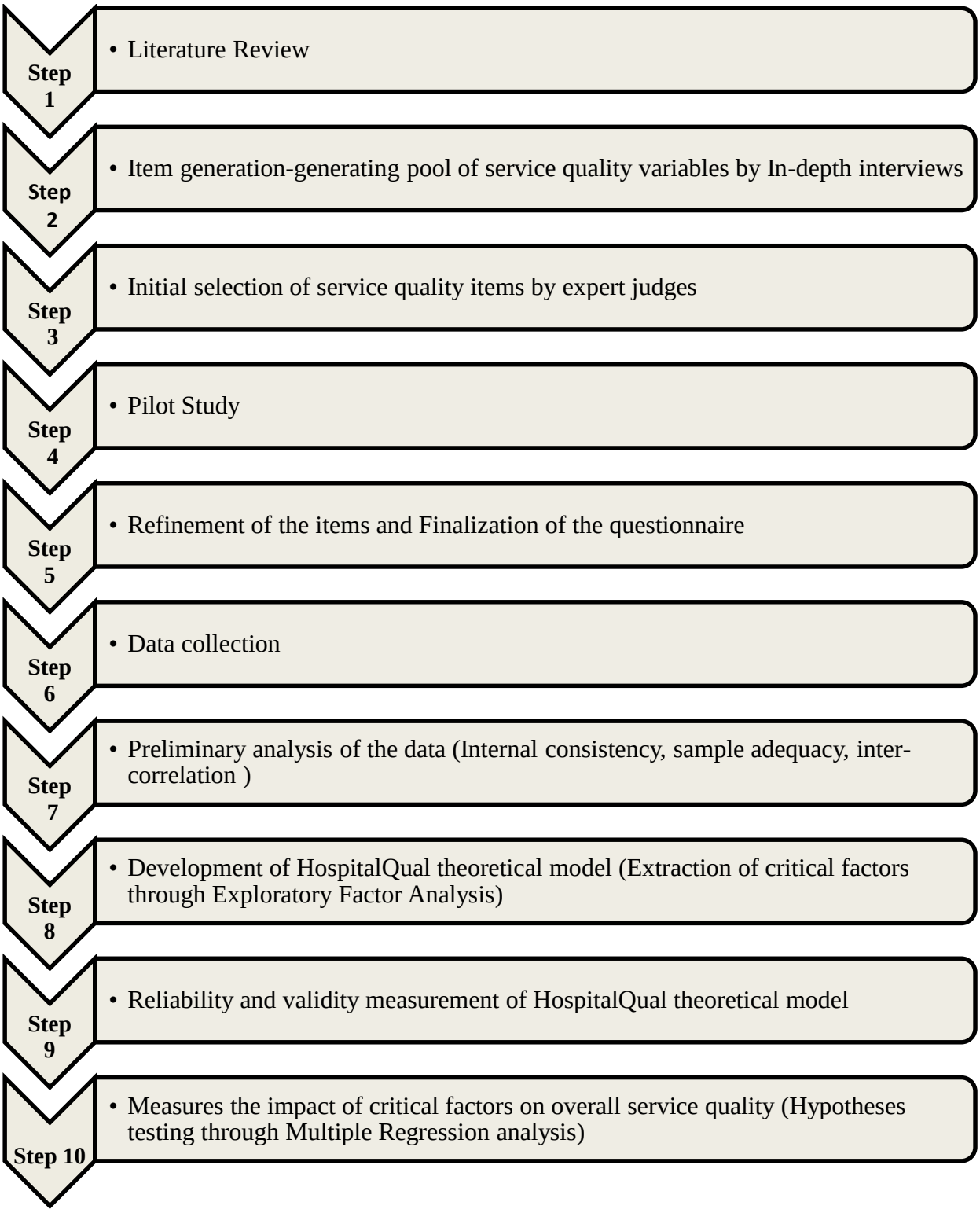

Figure 4.2: Steps in the Development of HospitalQual Theoretical Model

4.1.2 Item Generation

The study initially carried out in-depth interviews of forty inpatients from private hospital A and public hospital A to identify the variables of inpatient service quality as perceived by the inpatients. Participants are asked to respond about the services being provided by the hospital in general, and later asked to share the good or difficult experience, satisfaction with hospital services and the factors important in evaluating inpatient service quality in a hospital.

For instance, the following types of questions are asked to inpatients in the hospital: "In your opinion, what is the best service provided by the hospital?", "How satisfied you are with the hospital services and why?", "What are the major strengths and weaknesses of the hospital?", and "Can you tell me about any particular positive or negative experiences you have experienced in the hospital?" The study then probed in depth by asking follow-up questions further discussing service quality perception issues with participants. For example, the study asked respondents to identify favorable/unfavorable factors that are important in evaluating inpatient service quality, to state the rationale for choosing these factors, and to rank the factors according to importance.

4.1.3 Initial Selection of Service Quality Items

In the third step, to establish the face (content) validity, each item was critically reviewed by the experts and academicians to reduce the initial item pool. Expert judges reviewed individual items, and are asked to rate each item as "clearly representative", "somewhat representative" and "not representative". Only items rated "clearly representative" and "somewhat representative" are retained in the questionnaire. The items are then evaluated several times in an iterative process based on the feedback provided by the expert judges from hospitals and academicians. After eliminating and/or reclassifying certain items, the draft questionnaire is prepared for the pilot study.

Table 4.1 List of items generated for the study

S.No	Items
1	Doctor was prompt in attending to your need
2	Correct assessment of your health condition by doctors
3	Adequate information was provided by the doctor about treatment procedures and outcomes
4	Doctors listen carefully to your problem
5	Fruitfulness of the medical treatment received by you
6	Medical advice and instructions provided by doctors at the time of your discharge;
7	Integration of doctor was adequate
8	Nurse was prompt in attending to your need
9	Integration of nurse was adequate
10	Nurse was helpful and courteous
11	You are given an adequate medication
12	Nursing care provided was satisfactory
13	Provide Emotional and Physical Support to you and your family members
14	The hospital provides required Laboratory services
15	Imaging services are provided by the hospital
16	Required Medicines are available in the pharmacy
17	Medical records are managed properly
18	Hospital provides nutritious food (as per the guidelines of nutritionist)
19	Housekeeping staff maintains cleanliness in the ward/room (housekeeping services)
20	Security services are good
21	Parking services are good
22	Ease of consulting with doctors (within a reasonable waiting time);
23	Prompt, simple and clear admission processes and procedures
24	Ease of getting diagnostic tests done
25	Assistance provided to you by the staff in arranging for additional care or services (e.g. physiotherapy);
26	Timeliness of your scheduled admission/surgery
27	Staff responded immediately to your complaint
28	Billing procedure was accurate and error free
29	Discharge process was simple and completed without delay
30	Hospital administration shown sincere interest to solve your problems
31	Adequacy of hygienic care and procedures (e.g. wearing gloves) followed by the hospital personnel;
32	Infection-free environment/treatment provided by the hospital
33	The hospital provides proper measures (e.g. bed with side…handrails in aisles, ramps designed for wheelchairs) Reduce the Risk of Patient Harm Resulting from Falls
34	I have not received infection after admitting in the hospital
35	Hospital has an Effective Communication Fire safety & emergency exits
36	Bio-medical Waste (BMW) is managed properly
37	You feel safe under the care of the staff
38	Adequate information was provided by Front office personnel
39	During admission the patient and /or the family members are educated to make informed decisions
40	Staff communicate in a language that you understand
41	Daily progress was adequately informed by doctors
42	The hospital have proper sign-posts
43	Hospital Staff was caring cohesive
44	Hospital staff gives individual attention
45	Hospital Staff was helpful
46	Hospital staff was responsive
47	Hospital Staff was courteous
48	Hospital Staff was professional
49	The physical facilities of hospital are visually appealing
50	The hospital have necessary up-to-date equipment
51	The hospital staff are well dressed and appear neat

4.1.4 Pilot Study

It is very important practice to conduct a pilot study with a small number of respondents to ensure feasibility of large scale studies. The formal pilot study is conducted with 60 inpatients in the above mentioned two hospitals to identify and eliminate potential problems (Malhotra & Dash, 2010). The analysis of pretest data helped to ensure that all the data collected would be utilized and the questionnaire would obtain all the necessary data (Reynolds, Diamantopoulos & Schlegelmilch, 1993).

Table 4.2 Pilot Study - Questionnaire Checklist

1	Specify information needed	✓
2	Specify the type of interviewing method	✓
3	Determine the content of individual questions	✓
4	Design the questions to overcome the respondents' inability and unwillingness to answer	✓
5	Decide on the question structure	✓
6	Determine the question wording	✓
7	Arrange the questions in proper order	✓
8	Identify the form and layout	✓
9	Reproduce the questionnaire	✓
10	Eliminate bugs by pretesting	✓

Source: Malhotra & Dash, (2010)

The draft questionnaire is administered face to face to inpatients and the purpose of the pretesting is explained. During the pretest, several steps are taken to ensure meaningful and timely participation by the inpatients in hospitals. The table 4.2 presents the checklist for the purpose of pretest as prescribed by Malhotra & Dash, (2010). Each inpatient assessed the degree or extent of inpatient service quality practices in hospital by rating each measurement item using 5 point Likert scale described in the questionnaire. After completion of the instruments, thorough discussions are carried out with the inpatients.

4.1.5 Refinement of the Items and Finalization of the Questionnaire

From the pilot study results, the study refined the draft questionnaire with required changes. The questionnaire which is used for the collecting the data is discussed below:

4.1.6 Survey Instrument

After the completion of the first four steps, out of total 51 measurement items (variables), 39 are retained to measure the inpatient service quality in hospital (Table 4.1). The Questionnaire contains three sections: A, B and C. Section A contains 39 statements related to inpatient service quality in the hospital. All the items are randomly placed and the 5 point Likert scale is used throughout the questionnaire. Section B contains one item to evaluate the level of overall inpatient service quality. It also includes three variables to evaluate the inpatient loyalty. Section C includes 12 questions pertaining to respondents' profile and one open ended question on suggestions to improve the inpatient service quality provided by the hospital.

Table 4.3: Initial Service Quality Items

S.No	Items
1.	Hospital admission processes was simple
2.	Doctor was prompt in attending to your need
3.	Nurse was prompt in attending to your need
4.	Doctors listen carefully to your problem
5.	Nurse was given your prescribed medication on time
6.	During admission you and /or your family members were given proper counseling to make informed decisions
7.	You are satisfied with the time spent by doctors with you during your hospitalization
8.	Nurse was courteous
9.	Hospital ambience is good
10.	Adequate information was provided by the doctor about treatment procedures and outcomes
11.	Hospital administration explained the estimated cost of hospitalization
12.	Nurse was helpful
13.	The hospital provides Diagnostics services with less waiting time
14.	Hospital Staff was friendly
15.	Required Medicines are available in the pharmacy
16.	Hospital provided good food
17.	Hospital Staff was helpful
18.	Housekeeping staff maintains cleanliness in the ward/room
19.	Proper facilities provided by the hospital administrators
20.	Hospital administration responded immediately to solve your problems
21.	Billing procedure was error free

22.	Discharge process was completed without delay
23.	Fast retrieval of documents
24.	Adequacy of hygienic care and procedures (e.g. hand wash, wearing gloves) followed by the hospital staff
25.	The hospital provides proper measures (e.g. bed with side handrails in aisles, ramps designed for wheelchairs) to reduce the risk of patient harm resulting from falls
26.	Not suffered from hospital infection after 24 hours of admission
27.	Adequate information was provided by the staff
28.	Hospital Staff was caring
29.	Staff communicate in a language that you understand
30.	Hospital staff gave individual attention
31.	Bio-medical Waste (BMW) was treated properly
32.	Hospital staff was responsive
33.	There is a clarity in staff communication
34.	Hospital Staff was professional
35.	The physical facilities of hospital are visually appealing
36.	The hospital have modern and state-of-the-art equipment
37.	The hospital staff are well dressed and appear neat
38.	Hospital has an effective fire safety
39.	Satisfied with medical instructions provided by doctors at the time of your discharge

4.2 Data Collection

After the finalization of the questionnaire based on the inputs from the pretest, the study is carried further and collected the full scale data from six hospitals, which include three hospitals from public sector and another three from private sector located in Hyderabad, the capital city of Andhra Pradesh. At the end of the data collection (From 1st December, 2012 to 31st July, 2013) 1070 useful samples are collected out of the 1300 total distributed samples. The exploratory factor analysis is performed on the 39 measurement items of inpatient service quality with sample n_i= 246 data.

4.3 Preliminary Analysis of the Data

The exploratory factor analysis is performed to identify the underlying dimensions of inpatient service quality by analyzing the patterns of correlations among 39 inpatient service quality variables. The study initially examined the statistical prerequisites to perform factor analysis, such as descriptive statistics, sample adequacy and measures of inter-correlation.

4.3.1 Descriptive Statistics

A preliminary analysis of the data is analyzed by item statistics: mean and standard deviation and Cronbach's alpha. It is found that all the attributes have standard deviation < 2.0 which indicates all the respondents have relatively same level of agreement on the inpatient service quality. Cronbach's alpha coefficient and critical analysis of correlation of the data matrix are computed to ensure the usage of factor analysis (Hair et al., 2008). The value of coefficient alpha of all the items is above 0.63 which indicates that all the items are internally consistent. A total of 14 items are discarded because of smaller (< 0.40) item to total correlation (Hair et al., 2008 and Nunnally, 1970).

4.3.2 Sample Adequacy

The study used a sample size of 246 inpatients from select public and private hospitals, to perform the factor analysis. This sample size meets the minimum requirement of five observations per variable (Hair et al., 2008). The total variables in the study are 39 hence the minimum sample size requirement is 195. However, the present sample (246) is more than the minimum requirement and hence sufficient to conduct factor analysis. The other test to check the sample appropriateness is Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy statistic. It indicates the proportion of variance in variables that might be caused by underlying factors. The KMO index ranges from 0 to 1, reaching 1 when each variable is perfectly predicted without error by the other variables.

The KMO value must exceed 0.50 for both the overall fit and each individual variable, and the value above 0.8 is considered meritorious (Hair et al., 2008). The KMO measurable value for the present study is 0.865; hence the sample size is adequate to perform the exploratory factor analysis.

Table 4.4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.865
Bartlett's Test of Sphericity	Approx. Chi-Square	1.05104
	Df	630
	Sig.	.000

4.3.3 Measures of Inter-Correlation

The Bartlett test of sphericity is another statistical prerequisite to continue with exploratory factor analysis. This value is significant for the sample at 0.05, $\chi 2 = 1.05104$ ($p = 0.000$). Bartlett's test of sphericity examines the hypothesis that correlation matrix is an identity matrix, which would indicate that the variables are unrelated and therefore unsuitable for structure detection. If the $\chi 2$ value is significant at 0.05, that leads to the rejection of the null hypotheses and deemed to accept the alternative hypothesis that there is significant correlations among at least some of the variables. Factor analysis is an interdependence technique and is equally important to satisfy the statistical prerequisites along with meeting its underlying conceptual assumptions. Once the variables are specified and measures of inter-correlation matrix are significant, the study is ready to proceed with the factor analysis to identify the underlying structure of relationships.

4.4 Exploratory Factor Analysis

According to Hair et.al (2008), the primary purpose of factor analysis is to define the underlying structure among the variables by analyzing the structure of the interrelationships (correlations) among the large number of variables (Hair et al. 2008). The final 39 observed variables after preliminary analysis are considered as input for factor analysis. After fulfilling the prerequisites for conducting factor analysis, the next stage is to select the factor extraction method, rotational method and criteria for the number of factors to be extracted.

4.4.1 Factor Extraction and Rotation Methods

In factor analysis, the extraction refers to the process of obtaining underlying factors or components. Principal component factor analysis is more appropriate when data reduction is the primary concern and new meaningful underlying variables are being identified. In the present study the principal component analysis followed and adopted a Varimax rotation to reduce the data either into a smaller number of variables or set of uncorrelated measures.

4.4.2 Number of Factors to Extract

There are multiple criteria for deciding number of factors to be extracted. The present study followed a hybrid strategy to extract the factors by following two criteria: Kaiser’s

criteria (Latent root criterion) and scree test criteria which is commonly used in the social science research to extract the factors.

The study used latent root method as the first criterion to extract the factors. By this criterion only the factors having latent roots or eigenvalue greater than 1 are considered as factors. The below table 4.5, presents the average commonalities of items which are more than 0.55.

Table 4.5: Communalities

	Initial	Extraction
MS1	1.000	.940
MS2	1.000	.777
MS3	1.000	.937
MS4	1.000	.859
NS1	1.000	.894
NS2	1.000	.895
NS3	1.000	.692
NS4	1.000	.781
SS1	1.000	.912
SS2	1.000	.832
SS3	1.000	.774
SS4	1.000	.909
PS1	1.000	.886
PS2	1.000	.971
PS3	1.000	.969
AS1	1.000	.665
AS2	1.000	.515
AS3	1.000	.775
AS4	1.000	.739
C1	1.000	.653
C2	1.000	.866
C3	1.000	.891
I1	1.000	.735
I2	1.000	.717
I3	1.000	.620

Extraction Method: Principal Component Analysis.

The figure 4.5 shows the scree plot that is derived by plotting the eigenvalues against the number of factors in their order of extraction and the shape of the resulting curve shows the cutoff point to evaluate the extracted factors. After following the latent root and scree

test criteria, the priori criterion is used because the existing studies assert the use of five to seven factors to extract as ideal. Thus the study extracted seven factors of inpatient service quality.

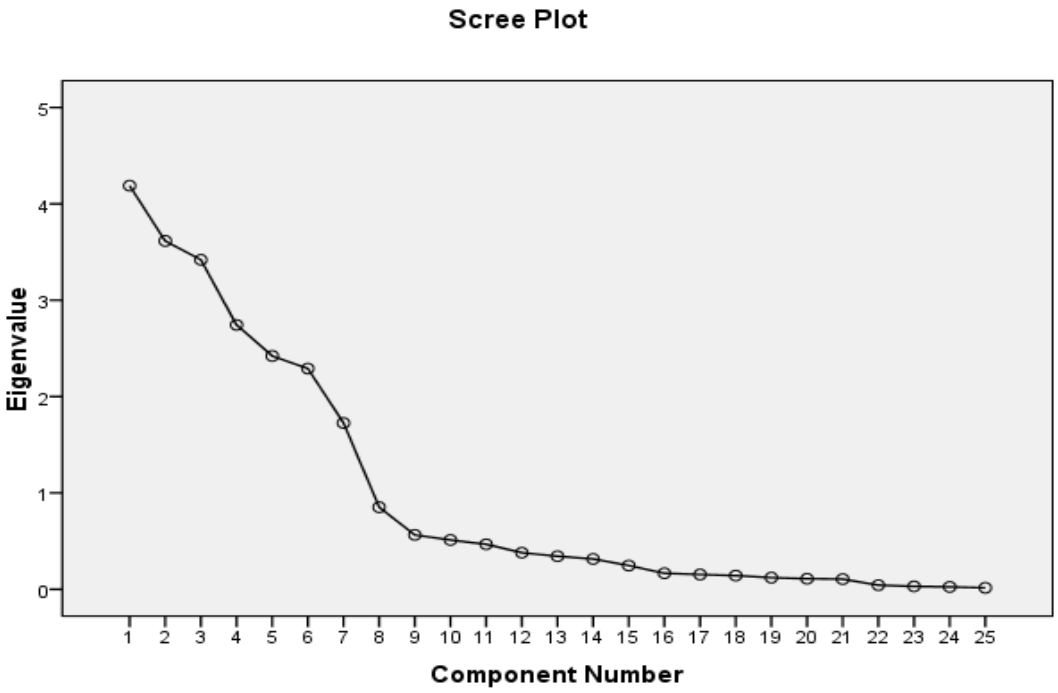

Figure 4.3: Cattell's Scree Plot for Factor Extraction

The final result of the total variance and eigenvalues of seven factors is shown in table 4.5. The table presents the total variance explained by the factor analysis solution and gives an indication about the number of useful factors. The first column under "initial eigenvalues" gives the eigenvalues for all the possible factors in a decreasing order. The second column titled "extraction sums of squared loadings" gives information on factors with eigenvalues greater than 1 after factor extraction. The last part of the table, titled "rotated sums of squared loadings" gives the information on the extracted factors after rotation. The value under the column "Cumulative %" indicates that the seven extracted factors explain 81.615% of the variance.

Table 4.6: Total Variance Explained

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.188	16.753	16.753	4.188	16.753	16.753	3.511	14.042	14.042
2	3.615	14.459	31.212	3.615	14.459	31.212	3.469	13.874	27.916
3	3.419	13.675	44.888	3.419	13.675	44.888	3.209	12.837	40.753
4	2.744	10.975	55.863	2.744	10.975	55.863	2.861	11.444	52.197
5	2.421	9.686	65.548	2.421	9.686	65.548	2.665	10.660	62.857
6	2.291	9.163	74.711	2.291	9.163	74.711	2.386	9.545	72.402
7	1.726	6.904	81.615	1.726	6.904	81.615	2.303	9.213	81.615
8	.852	3.408	85.023						
9	.564	2.257	87.279						
10	.512	2.047	89.326						
11	.468	1.870	91.197						
12	.380	1.520	92.716						
13	.343	1.373	94.089						
14	.315	1.260	95.349						
15	.247	.987	96.336						
16	.167	.667	97.002						
17	.154	.614	97.617						
18	.143	.572	98.188						
19	.121	.485	98.673						
20	.110	.439	99.112						
21	.106	.424	99.536						
22	.044	.174	99.710						
23	.032	.126	99.836						
24	.025	.100	99.937						
25	.016	.063	100.000						

Extraction Method: Principal Component Analysis.

4.4.3 Interpretation of Factor Matrix

The study used the three criteria to determine the factor structure. They are: (1) Factor loadings more than +0.40 remained for further analysis (2) items which cross load more than one factor are excluded and (3) the difference between the cross loadings should be minimum 0.20 (Hair et al., 2008). Fourteen items did not fit these criteria therefore they

are dropped from the subsequent analysis in the study. A total of 25 items grouped under seven dimensions emerged from the factor analysis as shown in the table 4.7.

Table 4.7: Rotated Component Matrix

Rotated Component Matrix[a]

	Component						
	1	2	3	4	5	6	7
MS1	.961						
MS2	.859						
MS3	.950						
MS4	.931						
NS1			.933				
NS2			.936				
NS3			.810				
NS4			.843				
SS1		.955					
SS2		.934					
SS3		.844					
SS4		.948					
PS1				.936			
PS2				.980			
PS3				.974			
AS1					.837		
AS2					.636		
AS3					.890		
AS4					.840		
C1						.790	
C2						.904	
C3						.933	
I1							.858
I2							.935
I3							.794

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

a. Rotation converged in 6 iterations.

4.4.4 HospitalQual Theoretical Model - Factors

Interpreting the nature of variables and assigning meaning to the factors is an extremely important consideration in determining the number of factors to extract (Hair, et al., 2008). The process of naming the seven extracted factors is based on the nature of the variables, judgments by the experts and academicians and examination of the previous research studies. The extracted seven factors are named as: *Medical Service, Nursing Services, Supportive Services, Administrative Services, Patient Safety, Patient Communication and Hospital Infrastructure*. Thus, based on the results of the exploratory factor analysis the HospitalQual theoretical model emerged with seven factors and 25 items. The table 4.8 provides the final result of explorative factor analysis.

Table 4.8: Final Results of Factor Analysis

Variables	1	2	3	4	5	6	7
Factor 1: Medical Service (MS)							
MS1 Doctor was prompt in attending your need	*0.96*						
MS2 Doctors listen carefully to your problem	*0.85*						
MS3 You are satisfied with the time spent by doctors with you during your hospitalization	*0.95*						
MS4 Adequate information was provided by the doctor about treatment procedures and outcomes	*0.93*						
Factor 2: Nursing Services (NS)							
NS1 Nurse was prompt in attending to your need		*0.93*					
NS2 Nurse was given your prescribed medication on time		*0.93*					
NS3 Nurse was courteous		*0.81*					
NS4 Nurse was helpful		*0.84*					
Factor 3: Supportive Services (SS)							
SS1 The hospital provides Diagnostics services with less waiting time			*0.95*				
SS2 Required Medicines are available in the pharmacy			*0.93*				
SS3 Hospital provided good food							
SS4 Housekeeping staff maintains cleanliness in the ward/room			*0.84*				
			0.94				
Factor 4: Administrative Services (AS)							
AS1 Hospital admission processes was simple				*0.83*			
AS2Proper facilities provided by the hospital administrators				*0.63*			
AS3 Hospital administration responded immediately to solve your problems				*0.89*			
AS4 Discharge process was completed without delay				*0.84*			
Factor 5: Patient Safety (PS)							
PS1 Adequacy of hygienic care and procedures (e.g. hand wash, wearing gloves) followed by the hospital staff					*0.93*		
PS2 The hospital provides proper measures (e.g. bed with side handrails in aisles, ramps designed for wheelchairs) to reduce the risk of patient harm resulting from falls					*0.98*		
PS3 Not suffered from hospital infection after 24 hours of admission					*0.97*		
Factor 6: Patient Communication (PC)							
C1 Adequate information was provided by the staff						*0.79*	
C2 There is a clarity in staff communication						*0.90*	
C3 During admission you and /or your family members were given proper counseling to make informed decisions						*0.93*	
Factor 7: Hospital Infrastructure (HI)							
I1 The physical facilities of hospital are visually appealing							*0.85*
I2 The hospital have necessary up-to-date equipment							*0.93*
I3 The hospital staff are well dressed and appear neat							*0.79*

4.5 Reliability of HospitalQual Theoretical Model

Reliability is an assessment of the degree of consistency between multiple measurements of a variable (Hair et al., 2008). The Cronbach's alpha coefficient is the most widely used measure to assess the consistency of the entire scale and it could be considered reliable with a lower limit of 0.70 although it decreases to 0.60 in exploratory research (Cronbach, 1951 and Straub et al., 2004). The reliable measures of the seven extracted critical factors of HospitalQual are shown in tables from 4.9 to 4.15. Using the SPSS reliability program, an internal consistency analysis is performed separately for the items of each critical factor of inpatient service quality. The seven factors have high Cronbach's alpha values as shown in the tables. It indicates all of these factors contribute the largest part of the variance of the HospitalQual theoretical model.

Table 4.9 Reliability Analysis of Factor 1: Medical Service

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
MS1	9.60	7.191	.943	.922	.953
MS2	9.52	7.744	.799	.965	
MS3	9.63	7.235	.940	.923	
MS4	9.60	7.482	.869	.944	

Table 4.10 Reliability Analysis of Factor 2: Nursing Services

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
NS1	10.62	9.883	.835	.849	.895
NS2	10.62	9.876	.836	.848	
NS3	10.56	9.456	.731	.877	
NS4	10.79	7.629	.762	.889	

Table 4.11 Reliability Analysis of Factor 3: Supportive Services

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
SS1	9.54	8.956	.913	.909	.943
SS2	9.57	9.322	.838	.933	
SS3	9.42	9.450	.789	.948	
SS4	9.48	8.872	.914	.909	

Table 4.12 Reliability Analysis of Factor 5: Administrative Services

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
AS1	9.92	6.105	.627	.793	.826
AS2	9.92	5.905	.542	.835	
AS3	10.05	5.778	.731	.748	
AS4	10.03	5.331	.729	.744	

Table 4.13 Reliability Analysis of Factor 4: Patient Safety

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
PS1	8.12	2.472	.876	.998	.970
PS2	8.16	2.204	.969	.932	
PS3	8.16	2.196	.966	.934	

Table 4.14 Reliability Analysis of Factor 6: Patient Communication

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
PC1	5.43	5.040	.623	.941	
PC2	5.03	4.067	.825	.767	.877
PC3	5.03	3.855	.855	.737	

Table 4.15 Reliability Analysis of Factor 6: Hospital Infrastructure

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Cronbach's Alpha
I1	7.56	3.205	.642	.639	
I2	7.73	2.878	.611	.653	.759
I3	7.91	2.703	.541	.751	

4.6 Validity of HospitalQual Theoretical Model

The validity of a measure is the extent to which it measures what is intended to be measured. Given that the questionnaire had been appropriately designed through a comprehensive review of relevant literature, in-depth interviews and then fined-tuned based on the suggestions from various experts, content (face) validity of the instrument is ensured (Kaplan & Saccuzzo, 1993).

The ANOVA test is administered to validate the scale. As shown tables 4.16, the results of the theoretical model show that all the dimensions of inpatient service quality, statistically significant and these dimensions are significantly explaining the model.

Table 4.16: Results of ANOVA

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		655.431	823	.796		
Within People	Between Items	1202.316	6	200.386	249.008	.000
	Residual	3973.793	4938	.805		
	Total	5176.109	4944	1.047		
Total		5831.540	5767	1.011		

Grand Mean = 3.3968

4.7 Discussion on Factors of HospitalQual

The exploratory research provides seven factor structure for inpatient service quality in hospitals. The emergent factors are Medical Service, Nursing Services, Supportive Services, Administrative Services, Patient Safety, Patient Communication and Hospital Infrastructure. After exploratory factor analysis only 25 of the 39 attributes identified in the pilot study have been loaded on to the following seven dimensions when factor loading of 0.50 and above was taken into consideration.

4.7.1 Medical Service

Functional aspect, i.e. the way the medical service is delivered to a patient is a very important dimension of inpatient service quality. When interviewed most of the doctors indicated that the medical service quality is also as equal to medical quality (i.e. Technical quality) to the patients. They further expressed that it is not enough to only provide the best treatment, but also in a better way. Some researchers have used the factor mane as ‘medical care’ (Aagja J.P., & Garg R, 2010, Duggirala D et. al., 2008); ‘process characteristics’ (Amira E, 2008); ‘Clinical quality’ (Lawthers A.G et.al (1999); ‘Health care delivery’ (Narag R, 2010) in their study. In the present study, the experience of patients with clinical processes in the hospital is enclosed in Medical Service

dimension. The variables such as the doctor was prompt in attending the patients' need, listen to the patients, time spend by the doctor with patient, providing the adequate information to patient about the treatment and possible outcomes are four attributes which have a significant loading on to this dimension.

4.7.2 Nursing Services

Nursing has clearly been concerned with the service quality long before the current level emphasis on service quality. While this dimension of service quality is an important within the nursing purview, the breadth and depth of service quality are far greater. The most critical contribution of nursing to service quality in any setting is the ability to coordinate and integrate the multiple aspects of services within the care directly provided by nursing, and across the care delivered by others in the setting (http://www.ncbi.nlm). "Nursing services are most important to inpatient and influence the service quality in a greater extent" added by a nursing superintendent of the private hospital. The four attributes such as a nurse was prompt in attending patient need, nurse was given prescribed medication on time, nurse was courteous and nurse was helpful are loaded onto this dimension.

4.7.3 Supportive Services

Along with the world-class clinical care, supportive services play a vital role in providing the best service quality to the patients. The scholars have been classified the supportive services into various categories (Jah S.M, 2001; Kunders, G. D, 2004). This dimension deals with only few services which identified through the interviews from the doctors, administrators and more importantly from the patients' that are directly influencing the inpatient service quality in hospitals. The four attributes such as providing diagnostic services with less waiting time, the availability of medicines in the pharmacy, providing good food and clean housekeeping services are the four attributes which have a significant loading on to this dimension.

4.7.4 Administrative Services

Administrative procedures inspect the experience of patient with administrative in hospital. These services facilitate the production of a core service and include waiting time, appointment procedures, records and documentation are error free, providing the right service the first time. The dimension has been termed as 'administrative processes' (Duggirala D et. al, 2008); 'administrative services offered' (Angelopoulou P, et.al, 1998); 'administrative quality' (Dagger T.S et. all 2007); 'accessibility' (Gross R, & Nirel N, 1998); whereas researchers have considered admission, discharge as a part of administrative procedure (Aagja J.P & Garg R, 2010). The attributes loaded on this dimension are the simple admission process, proper facilities provided by the hospital administrators, response of hospital administration to solve problems and the discharge process without delay.

4.7.5 Patient Safety

Patient safety is another dimension of the service quality. Patient safety is the cornerstone of high-quality health care (http://www.ncbi.nlm.). The doctors, hospital administrators and the patients in their interviews identified the patient safety as one of the dimensions of inpatient service quality. Patient safety was defined by the Institute of Medicine (IOM) as "the prevention of harm to patients." (Aspden P, Corrigan J, Wolcott J, et al. 2004) The patient safety goals of Joint Commission International Accreditation Standards for Hospitals such as Identify Patients Correctly, Improve Effective Communication, Improve the Safety of High-Alert Medications, Ensure Correct-Site, Correct-Procedure, Correct-Patient Surgery, Reduce the Risk of Health Care–Associated Infections and Reduce the Risk of Patient Harm Resulting from Falls are very important in providing the better service to the inpatients (International Patient Safety Goals, JCI, 2010).

However, in the present study the attributes such as adequacy of hygienic care and procedures (e.g. hand wash, wearing gloves) followed by the hospital staff, providing proper measures (e.g. bed with side handrails in aisles, ramps designed for wheelchairs)

to reduce the risk of patient harm resulting from falls and hospital infections are loaded on the dimension of patient safety.

4.7.6 Patient Communication

Service quality depends upon effective communication between patients and providers. Ineffective communication can lead to improper diagnosis and delayed or improper health services (Berry L.L & Bendapudi N, 2007). According to the Joint Commission communication breakdown is the single greatest contributory factor to critical events and delays in care at U.S. hospitals. The interactive communication such as physician-patient, communication with family members and communication between doctors have been identified as important (M.G. Zifko-Baliga G.M & Robert Krampf F, 1997). The dimensions include information providing quickly, adequate information about treatments and ailments are provided, ease of obtaining information, level of feeling about interaction with doctors and nurses, family members are kept updated on the status of the patient. Also, researchers have included the dimension in their study (Anderson E, 1995).

However, meeting the communication needs of a diverse population with different languages is an important dimension of service quality in Indian hospitals. The Chief Operations Officer of a private hospital explains that the hospital cannot lag behind when it comes to communicating with patients and the patient' attendants, particularly when a patient is ill and vulnerable. The attributes such as providing adequate information by the staff, clarity in communication and providing proper counseling to patients/or to the family to take informed decisions are the three attributes which have a significant loading on to this dimension.

4.7.7 Hospital Infrastructure

Infrastructure is another important dimension of service Quality. The items such as physical hospital facilities, up-to-date equipment and the staff well dresses and appear neat which are adopted from Parasuraman et.al (19985) are loaded onto the dimension.

4.8 Multiple Regression Analysis

In the present study, multiple regression is used to determine the total effect of the seven factors (dimensions) on the inpatients' service quality level (or how well the seven dimensions predicted service quality), and to assess the relative importance of the individual dimensions. In the regression model the seven extracted factors are considered as the independent variables and the level of overall inpatients' service quality as the dependent variable. The summated scales of each factor are calculated by averaging all values of scale items within the particular factor (Hair et al., 2008). A multiple regression analysis was subsequently conducted to test the hypotheses from H1 to H7. Table 4.17 outlines the model summary of the regression analysis.

4.9 Hypotheses Testing (H1 to H7)

The proposed hypotheses are tested using multiple regression analysis as shown in the table 4.17. The model assesses the effect of Medical Service, Nursing Services, Supportive Services, Administrative Services, Patient Safety, Patient Communication and Hospital Infrastructure on the overall inpatient service quality of hospitals.

Table 4.17: Regression Coefficients - Effect of seven Factors on Inpatient Service Quality

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R Square
		B	Std. Error	Beta			
1	(Constant)	3.048	.310		9.844	.000	
	MS	.062	.029	.075	2.145	.032	
	NS	.66	.029	.079	2.242	.025	
	SS	.082	.029	.099	2.836	.005	.86
	AS	.078	.036	.077	2.197	.028	
	PS	.059	.038	.055	2.246	.023	
	PC	.068	.032	.074	2.101	.036	
	HI	.045	.038	.041	9.168	.000	

a. Dependent Variable: IPSQ

The result of regression analysis shown in the table 4.17 indicates that all the factors have a significant effect on overall inpatient service quality with positive standardized coefficient values. Hence, the proposed seven hypotheses significantly affect the level of inpatient service quality is supported.

4.10 Results of Hypotheses Testing (H1 to H7)

From the above regression analysis the proposed hypotheses H1 to H7 are tested. The model assesses the effect of medical service, nursing services, supportive services, administrative services, patient safety, patient communication and hospital infrastructure on the overall inpatient service quality of hospitals. The hypothesized relationships are detailed below:

Hypothesis 1: Medical service has a significant effect on overall inpatient service quality:

The results of regression analysis shown in table 4.17 indicate that the variable medical service has a statistically significant effect on overall inpatient service quality with positive standardized coefficient value 0.075. The t value is 2.145 and it is significant at the 5% level with p = .032. Hence, the hypothesis that the medical service significantly affects the level of inpatient service quality is supported.

Hypothesis 2: Nursing services have a significant effect on overall inpatient service quality:

The results of regression analysis shown in table 4.17 specify that the variable nursing services are statistically significant and positively predicting the dependent variable overall inpatient service quality with standardized coefficient 0.079. The t value is 2.242 and it is significant at the 5% level with p = .025. Therefore the hypothesis that there is a significant influence of nursing services on overall inpatient service quality is deemed to be accepted.

Hypothesis 3: Supportive services have a significant effect on overall inpatient service quality:

The results of regression analysis shown in table 4.17 indicate that support services are significantly associated with overall inpatient service quality of hospitals with positive standard coefficient value 0.099. The t value is 2.836 and it is significant at the 5% level with p = .005. Therefore, the hypothesis that support services have a significant effect on overall inpatient service quality is supported.

Hypothesis 4: Administrative services have a significant effect on overall inpatient service quality:

The results of regression analysis shown in table 4.17 indicate that the variable administrative services have a positive effect on overall service quality with standardized coefficient value 0.077. The t value is 2.197 and it is significant at the 5% level with p = .028. Hence, the hypothesis that the administrative services have a positive influence on overall inpatient service quality is deemed to be accepted.

Hypothesis 5: Patient safety has a significant effect on overall inpatient service quality:

The results of regression analysis shown in table 4.17 specify that patient safety has a positive effect on overall inpatient service quality with standardized coefficient value 0.055. The t value is 2.246 and it is significant at the 5% level with p = .023. Therefore, the hypothesis that the patient safety has significant influence the overall inpatient service quality is supported.

Hypothesis 6: Patient communication has a significant effect on overall inpatient service quality:

The results of regression analysis shown in table 4.17 indicate that the variable patient communication is significantly influencing the overall inpatient service quality with standardized coefficient value 0.074. The t value is 2.101 and it is significant at the 5% level with p = .036. Therefore, the hypothesis that the patient communication has significant effect the overall inpatient service quality is supported.

Hypothesis 7: Hospital Infrastructure has a significant effect on overall inpatient service quality:

The results of regression analysis shown in table 4.17 indicate that the variable hospital infrastructure is significantly influencing the overall inpatient service quality with standardized coefficient value 0.041. The t value is 9.168 and it is significant at the 5% level with p = .000. Therefore, the hypothesis that hospital infrastructure significantly influence the overall inpatient service quality is supported. The summary of hypotheses, results is shown in the table 4.18.

Table 4.18: Results of hypothesis testing

Hypothesis	t value	P value	Testing of Hypothesis
H_1: Medical Service has a significant effect on inpatient service quality	2.145	0.032	Accepted
H_2: Nursing Services have a significant effect on inpatient service quality	2.242	0.025	Accepted
H_3: Supportive Services have a significant effect on inpatient service quality	2.836	0.005	Accepted
H_4: Administrative Services have a significant on inpatient service quality	2.197	0.028	Accepted
H_5: Patient Safety has a significant effect on inpatient service quality	2.246	0.023	Accepted
H_6: Patient Communication has a significant effect on inpatient service quality	2.101	0.036	Accepted
H_7: Hospital Infrastructure has a significant effect on inpatient service quality	9.169	0.000	Accepted

SECTION 2

DEVELOPMENT OF HospitalQual MEASUREMENT MODEL

In the previous section, the "HospitalQual theoretical model" of seven latent constructs with 25 observed variables is developed through Explorative Factor Analysis (EFA). The present section intended to test and confirm the further analysis. This section used Confirmatory Factor Analysis (CFA) to test the multidimensionality of the HospitalQual theoretical model. First, the section demonstrates the development of first-order CFA model and later it develops the second-order CFA model by considering the first order latent constructs as indicators.

4.11 HospitalQual Measurement Model

A measurement model can be derived from Confirmatory Factor Analysis (CFA). CFA assumes that there are direct effects of the latent variables to their indicators and direct effects of the error and disturbance terms to their respective variables, but there are no hypothesized casual effects connecting the latent variables. The confirmative factor analysis is used to test the validity of the HospitalQual theoretical model. In testing of the validity of the factorial model, it seeks to identify the extent to which the items are designed to measure the particular factor (Byrne, 2010). In order to test the explorative factor structure more thoroughly, the study performed the confirmatory factor analysis using the sample $n_2 = 824$. The analysis of data is conducted through Structural Equation Modeling (SEM) using the statistical software AMOS (Analysis of Moment Structures) version 18.0 to confirm the factors which are identified in EFA. The process of developing a HospitalQual measurement model starts with preliminary analysis of the data.

4.12 Preliminary Analysis of the Data

A preliminary analysis of the data is conducted before testing the HospitalQual measurement model for assessment of normality, linearity and identification of outliers.

4.12.1 Assessment of Normality

Normality is a common assumption for multivariate applications because the large variation from the normal distribution is producing invalid results (Tabachnick & Fidel, 2001 and Hair et al., 2008). Normality refers to the data variation of an individual variable. The normality is observed by using kurtosis and skewness (Field, 2005; Tabachnick & Fidell, 2001; Hair et. al., 2008). Table 4.19 shows the result of kurtosis and skewness tests. It can be observed that the mean statistic value across all dimensions is around 3, and the skewness and kurtosis values also indicate that all the variables are normally distributed. Larger sample sizes reduce the detrimental effect of non-normality (Hair, 2008). The results of the test show that all variables are significant which might be due to the large sample size (n_2=824).

Table 4.19: Descriptive Statistics of HospitalQual's Dimensions

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
MS	824	1	5	3.20	.901	-.116	.085	-.541	.170
NS	824	2	5	3.55	.994	-.560	.085	-1.049	.170
SS	824	1	5	3.17	.999	-.079	.085	-.462	.170
PS	824	2	5	4.07	.751	-.487	.085	-.102	.170
AS	824	1	5	3.33	.779	-.015	.085	.286	.170
PC	824	1	5	2.58	1.009	.426	.085	-.212	.170
HI	824	1	5	3.87	.808	-.293	.085	-.358	.170
Valid N (listwise)	824								

4.12.2 Testing of Data Linearity

Linearity is the association between the variables where the change in one variable cause in a change of a corresponding variable. The study examined the linearity of the relationships among the variables. The multivariate techniques including multiple

regression, logistic regression, factor analysis and structural equation modeling have an implicit assumption based on correlation measures of association that is linearity (Hair et al., 2008). Hence, examining the relationships between the variables would assure no retreats of association between the variables. The linearity can be measured by Pearson's correlations or a scatter plot (Field, 2005; Tabachnick & Fidell, 2001; Hair et al., 2008). It is found that all the correlations are significantly and positively correlated to each other.

4.12.3 Assessment of Outliers

An assessment of outliers is done to identify the outliers in the data. Outliers represents the cases that are identified as distinctly different from the other observations in a particular set of data. A univariate outlier has an extreme score in a single variable falling in the outer ranges (high or low) of the distribution, whereas multivariate outliers have one or more extreme values on two or more variables (Kline, 2005). The common method to detect multivariate outliers is Mahalanobis D^2 measure. This method measures each observation's distance in multidimensional space from the mean center of all the observations. An assessment of outliers is reviewed in the AMOS output and no serious multivariate outliers are found.

4.13 Confirmatory Factor Analysis for Each Factor (Basic Models)

This section deals with the Confirmative Factor Analysis of each factor of HospitalQual. The Confirmative Factor Analysis of each underlying factor is required to confirm the unidimensionality of the factors.

4.13.1 CFA of Medical Service

The Medical Service (MS) dimension is measured by four indicators (variables) namely MS1-Doctor was prompt in attending your need, MS2- Doctors listen carefully to your problem, MS3-You are satisfied with the time spent by doctors with you during your hospitalization and MS4-Adequate information was provided by the doctor about

treatment procedures and outcomes. The schematic representation of the CFA model of medical service dimension (factor) is shown in figure 4.4.

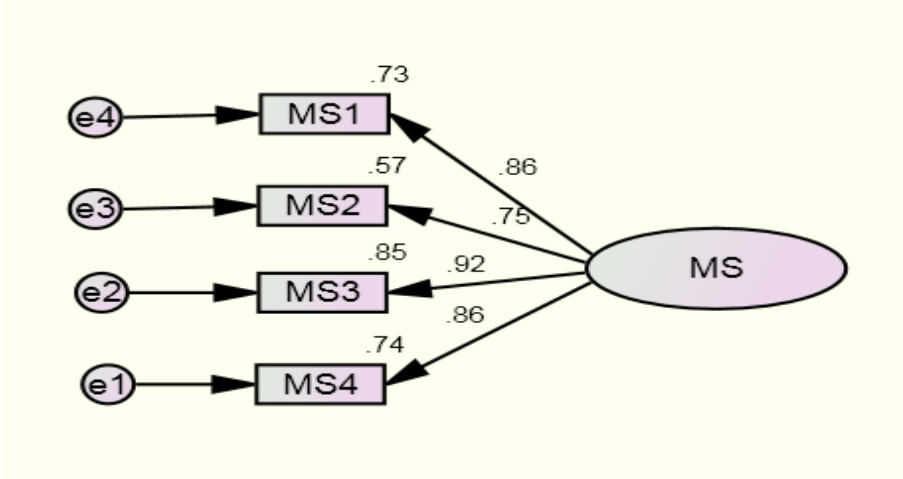

Figure 4.4: CFA Model of Medical Service Dimension

The model results chi–square 1238.127 with degrees of freedom 254 at significance level 0.001 and the remaining fit indices shown in table 4.20 are above the recommended level and the RMSEA is 0.080 which exactly met the criteria. All the four indicators are significantly loaded to medical services quality.

Table 4.20: Fit Indices of Medical Service Dimension

χ2	*df*	*GFI*	*AGFI*	*NFI*	*TLI*	*RFI*	*IFI*	*RMSEA*
1238.127	254	0.940	0.936	0.927	0.927	0.914	.938	0.080
Fit Indices as recommended by Hair at.al., 2008		>0.9	>0.9	>0.9	>0.9	>0.9	>0.9	<0.080

As shown in the table 4.21 all the indicators of the medical service dimension have significant loadings above standard estimation of 0.50 (Hair et al., 2008), where the lowest loading of MS2 is 0.75 and highest of MS3 is 0.92. The AVE and CR values are 0.72 and 0.91 respectively, which meet the minimum level of 0.50 for AVE and 0.70 for CR (Hair et al., 2008). It indicates that the medical service dimension has

convergent validity and reliability. Table 4.21 presents the Factor Loadings, Average Variance Extracted (AVE) and Construct Reliability (CR) of the medical service dimension.

Table 4.21: CFA Results of Medical Service Dimension

Attribute	Factor Loading	Squared Loadings	AVE	CR
MS1	.86	.73	0.72	.91
MS2	.75	.56		
MS3	.92	.84		
MS4	.86	.74		

4.13.2 CFA of Nursing Service

The Nursing Service (NS) dimension is measured by four indicators (variables) namely NS1- Nurse was prompt in attending to your need, NS2-Nurse was given your prescribed medication on time, NS3-Nurse was courteous and NS4-Nurse was helpful. The figure 4.5 shows the schematic representation of the CFA model of nursing service dimension (factor).

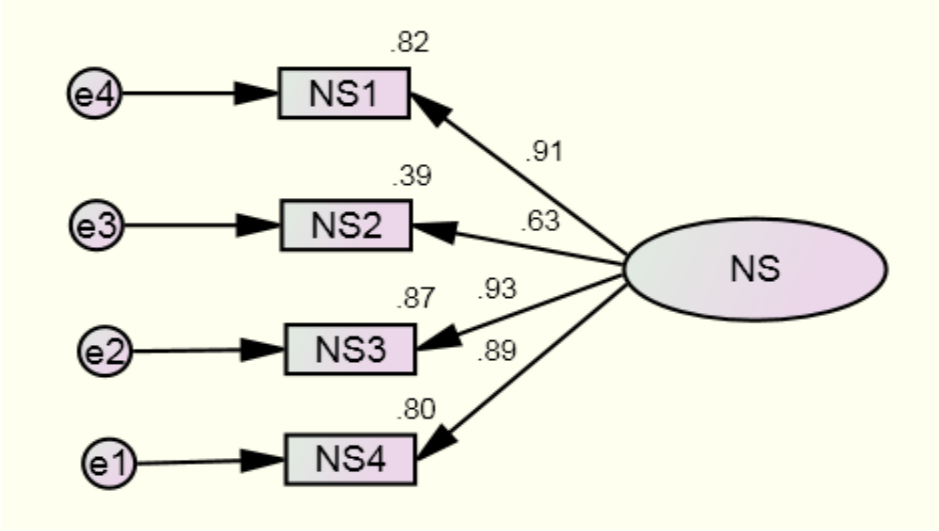

Figure 4.5: CFA Model of Nursing Services Dimension

The model results chi–square 5.343 with degrees of freedom 2 at significance level 0.001 and the remaining fit indices shown in table 4.22 are met the recommended level including the RMSEA. All the four indicators are significantly loaded to nursing service quality.

Table 4.22 Fit Indices of Nursing Service Dimension

χ2	*df*	*GFI*	*AGFI*	*NFI*	*RFI*	*IFI*	*TLI*	*CFI*	*RMSEA*
5.343	2	0.995	0.975	0.997	0.990	0.998	.994	.998	0.056

All the indicators of the dimension have significant loadings above standard estimation of 0.50 (Hair et al., 2008), where the lowest loading of NS2 is 0.63 and highest of NS3 is 0.93. In the same way, the AVE and CR values are 0.72 and 0.90 respectively, which meet the minimum level of 0.50 for AVE and 0.70 for CR (Hair et al., 2008). Thus, it indicates that nursing service dimension has convergent validity and reliability. Table 4.23 presents the Factor Loadings, Average Variance Extracted (AVE) and Construct Reliability (CR) of the nursing service dimension.

Table 4.23 CFA Results of Nursing Service Dimension

Attribute	Factor Loading	Squared Loadings	AVE	CR
NS1	.91	.82	0.72	.90
NS2	.63	.39		
NS3	.93	.86		
NS4	.89	.79		

4.13.3 CFA of Supportive Services

Supportive Services (SS) covers the indicators namely, SS1-The hospital provides Diagnostics services with less waiting time, SS2-Required Medicines are available in the pharmacy, SS3-Hospital provided good food (nutritious, hygiene and timelines) and SS4-

Housekeeping staff maintains cleanliness in the ward/room. All indicators are significantly loaded except indicator SS2 on the supportive services dimension as shown in the Figure 4.6.

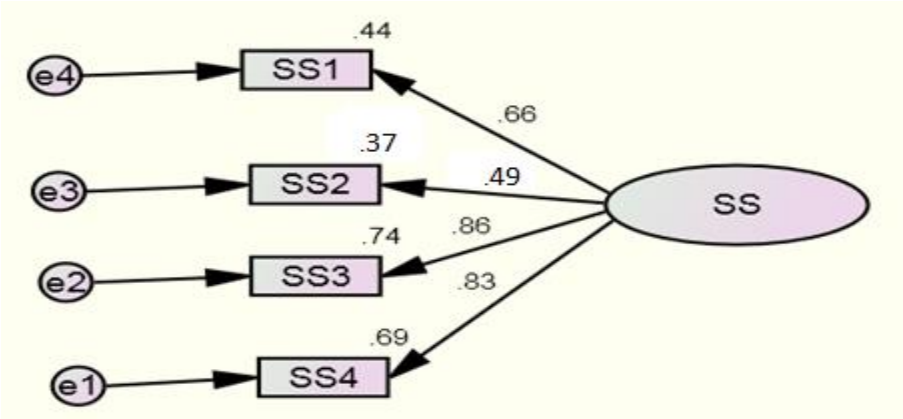

Figure 4.6: CFA Model of Supportive Services Dimension

In order to have a better model fit, the indicator SS2 was discarded from the model due to low factor loading i.e. less than 0.50 (Hair et al., 2008). The graphical representation of the revised CFA model of Supportive Services Dimension is shown in figure 4.7.

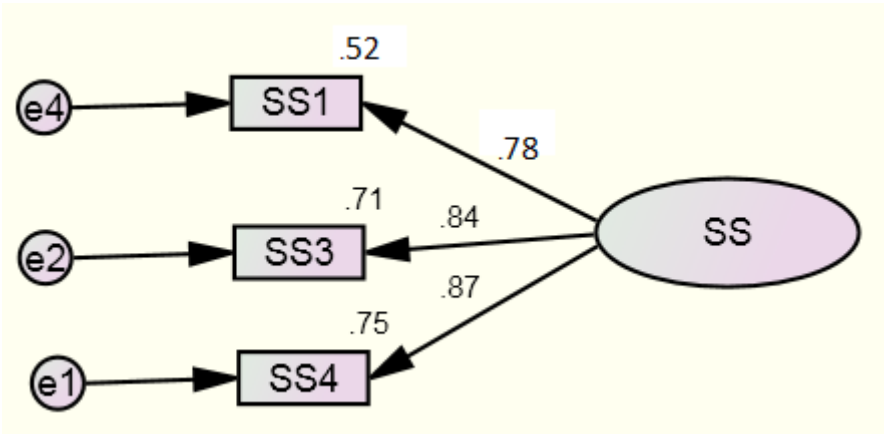

Figure 4.7: Revised CFA Model of Supportive Services Dimension

The model results chi–square 25.113 with degrees of freedom 2 at significance level 0.001 and the remaining fit indices shown in table 4.24 which are at the

recommended level except the RMSEA. All the three indicators are significantly loaded to supportive services dimension.

Table 4.24: Fit Indices of Supportive Service Dimension

χ2	*df*	*GFI*	*AGFI*	*NFI*	*RFI*	*IFI*	*TLI*	*CFI*	*RMSEA*
25.113	2	0.978	0.889	0.973	0.919	0.975	.925	.975	0.146

All the indicators of the supportive services dimension have significant loadings above standard estimation of 0.50 (Hair et al., 2008), where the loading of SS1 is 0.78, SS3 is .86 and SS4 is 0.83. The AVE and CR values are 0.51 and 0.76 respectively, which meet the minimum level of 0.50 for AVE and 0.70 for CR (Hair et al., 2008). This indicates that the supportive services dimension has convergent validity and reliability. Table 4.25 presents the Factor Loadings, Average Variance Extracted (AVE) and Construct Reliability (CR) of the supportive services dimension.

Table 4.25: CFA Results of Supportive Service Dimension

Attribute	Factor Loading	Squared Loadings	AVE	CR
SS1	.78	.43	0.51	.76
SS3	.86	.73		
SS4	.83	.68		

4.13.4 CFA of Administrative services

The Administrative Service (AS) dimension is measured by four indicators (variables) namely AS1- Hospital admission processes was simple, AS2-Proper facilities provided by the hospital administrators, AS3-Hospital administration responded immediately to solve your problems and AS4-Discharge process was completed without delay. The

figure 4.8 shows the schematic representation of the CFA model of administrative service dimension (factor).

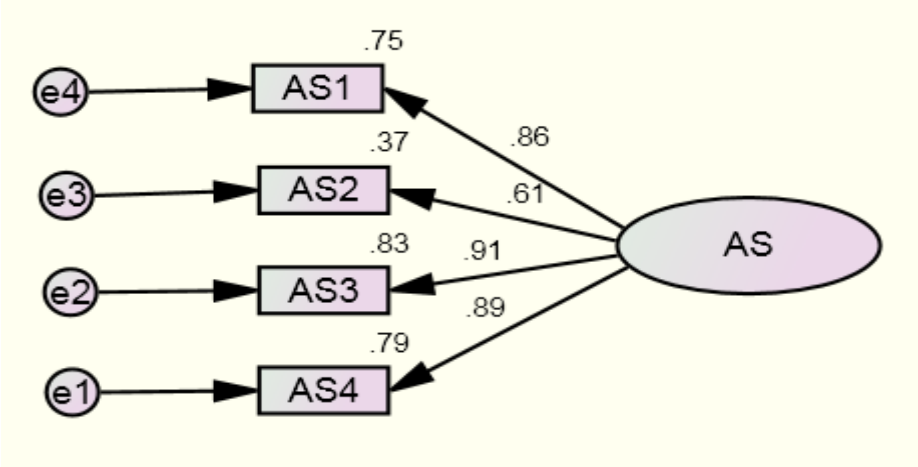

Figure 4.8: CFA Model of Administrative Service Dimension

The model results chi–square 4.246 with degrees of freedom 2 at significance level 0.001 and the remaining fit indices shown in table 4.26 are met recommended level including the RMSEA which is 0.046. All the four indicators are significantly loaded to administrative service dimension.

Table 4.26: Fit Indices of Administrative Service Dimension

χ2	*df*	*GFI*	*AGFI*	*NFI*	*RFI*	*IFI*	*TLI*	*CFI*	*RMSEA*
4.246	2	0.996	0.981	0.997	0.991	0.998	.995	.998	0.046

As shown in the table 4.27 all the indicators of the dimension have significant loadings above standard estimation of 0.50 (Hair et al., 2008), where the lowest loading of AS2 is 0.61 and highest of AS3 is 0.91. The AVE and CR values are 0.68 and 0.89 respectively, which meet the minimum level of 0.50 for AVE and 0.70 for CR (Hair et al., 2008). This indicates administrative service dimension has convergent validity and reliability. Table 4.27 presents the Factor Loadings, Average Variance Extracted (AVE) and Construct Reliability (CR) of the administrative service dimension.

Table 4.27: CFA Results of Administrative Service Dimension

Attribute	Factor Loading	Squared Loadings	AVE	CR
AS1	.86	.73	0.68	.89
AS2	.61	.37		
AS3	.91	.82		
AS4	.89	.79		

4.13.5 CFA of Patient Safety

The Patient Safety (PS) dimension is measured by three indicators (variables) namely PS1-Adequacy of hygienic care and procedures (e.g. hand wash, wearing gloves) followed by the hospital staff, PS2-The hospital provides proper measures (e.g. bed with side handrails in aisles, ramps designed for wheelchairs) to reduce the risk of patient harm resulting from falls and PS3- Not suffered from hospital infection after 24 hours of admission. The schematic representation of the CFA model of patient safety dimension (factor) is shown in figure 4.9.

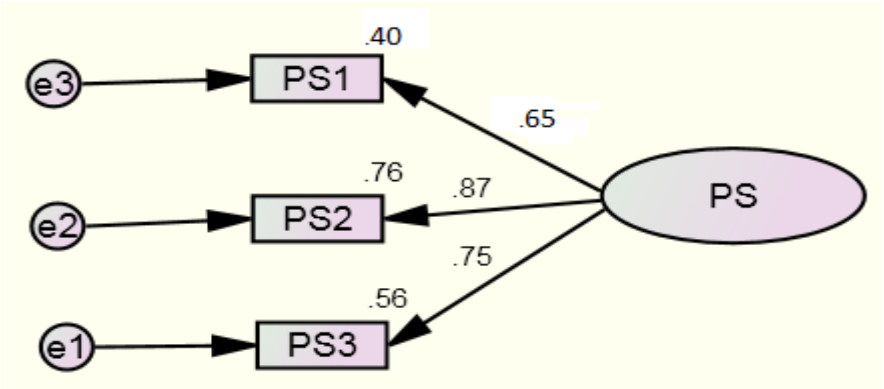

Figure 4.9: CFA Model of Patient Safety Dimension

The model results chi–square 10.282 with degrees of freedom 2 at significance level 0.001 and the remaining fit indices shown in table 4.28 are met the recommended level except the RMSEA. All the three indicators are significantly loaded on the dimension of patient safety.

Table 4.28 Fit Indices of Patient Safety Dimension

χ2	*df*	*GFI*	*AGFI*	*NFI*	*RFI*	*IFI*	*TLI*	*CFI*	*RMSEA*
10.282	2	0.996	0.910	0.902	0.941	0.988	.915	.918	0.120

As shown in the table 4.29, all the indicators of the dimension have significant loadings above standard estimation of 0.50 (Hair et al., 2008), where the loading of PS1 is 0.65, PS2 is .87 and PS3 is 0.75. In the same way, the AVE and CR values are 0.58 and 0.80 respectively, which meet the minimum level of 0.50 for AVE and 0.70 for CR (Hair et al., 2008). This indicates that the patient safety dimension has convergent validity and reliability.

Table 4.29: CFA Results of Patient Safety Dimension

Attribute	Factor Loading	Squared Loadings	AVE	CR
PS1	.65	.42	0.58	.80
PS2	.87	.75		
PS3	.75	.56		

4.13.6 CFA of Patient Communication

The Patient Communication (PC) dimension is measured by three indicators (variables) namely PC1-Adequate information was provided by the staff, PC2-There is a clarity in staff communication and PC3-During admission you and /or your family members were given proper counseling to make informed decisions. The schematic representation of the CFA model of patient communication (factor) is shown in figure 4.10.

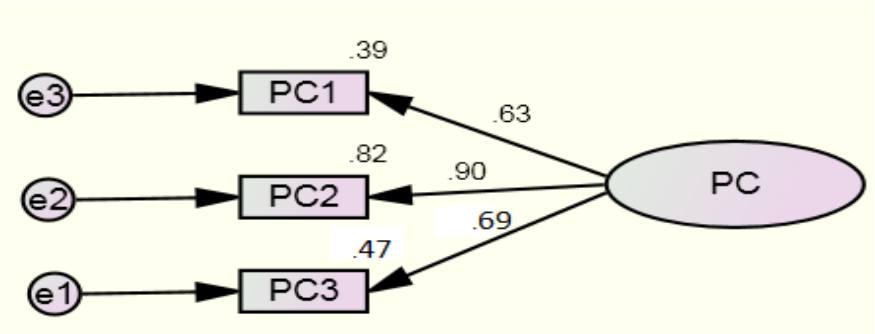

Figure 4.10 CFA Model of Patient Communication

The model results chi–square 120.68 with degrees of freedom 2 at significance level 0.001 and the remaining fit indices shown in table 4.30 are above the recommended level except the RMSEA which is slightly above the recommended level (>0.080). All the three indicators are significantly loaded on the dimension of patient communication.

Table 4.30: Fit Indices of Patient Communication Dimension

χ2	*df*	*GFI*	*AGFI*	*NFI*	*RFI*	*IFI*	*TLI*	*CFI*	*RMSEA*
120.68	2	0.926	0.905	0.910	0.912	0.920	.918	.906	0.089

As shown in the table 4.31, all the indicators of the dimension have significant loadings above standard estimation of 0.50 (Hair et al., 2008), where the lowest loading of PC1 is 0.63 and highest of PC2 is 0.90. The AVE and CR values are 0.56 and 0.78 respectively, which meet the minimum level of 0.50 for AVE and 0.70 for CR (Hair et al., 2008). Thus, it indicates that the dimension of patient communication has convergent validity and reliability. Table 4.31 presents the Factor Loadings, Average Variance Extracted (AVE) and Construct Reliability (CR) of the patient communication dimension.

Table 4.31: CFA Results of Patient Communication Dimension

Attribute	Factor Loading	Squared Loadings	AVE	CR
PC1	.63	.39	0.56	.78
PC2	.90	.81		
PC3	.69	.47		

4.13.7 CFA of Hospital Infrastructure

Hospital Infrastructure (HI) includes the indicators, namely HI1-The physical facilities of hospital are visually appealing, HI2-The hospital have necessary up-to-date equipment

and HI3-The hospital staff are well dressed and appear neat. The indicators HI1 and HI3 are significantly loaded except HI2 on the dimension as shown in the figure 4.11.

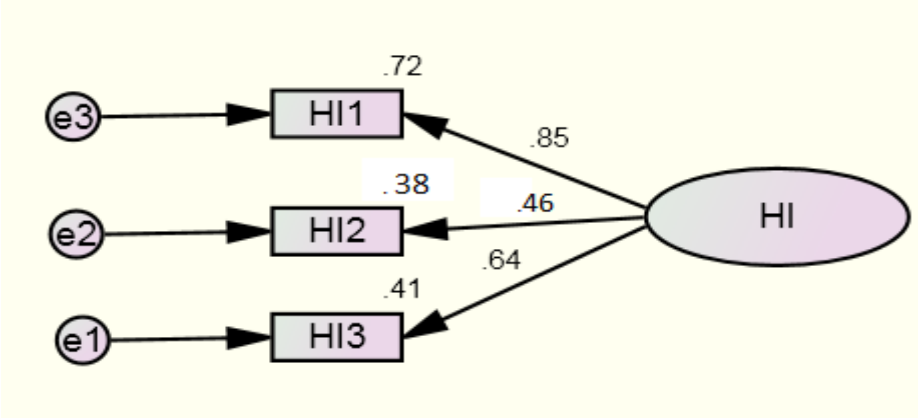

Figure 4.11: CFA Model of Hospital Infrastructure Dimension

In order to have a better model fit, the indicator HI2 is discarded from the model due to low factor loading. The graphical representation of the revised CFA model is shown in figure 4.12.

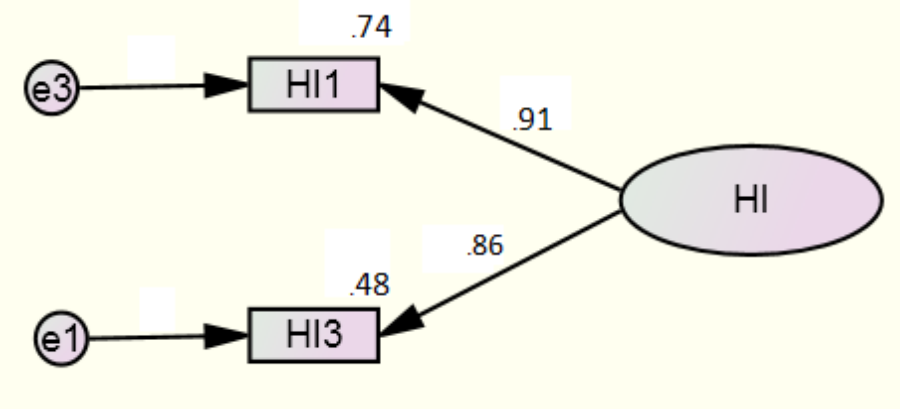

Figure 4.12: Revised CFA Model of Hospital Infrastructure Dimension

The model results chi–square 12.462 with degrees of freedom 2 at significance level 0.001 and the remaining fit indices shown in table 4.32 are met the recommended level including the RMSEA which is 0.070. Two indicators are significantly loaded to the dimensions of hospital infrastructure.

Table 4.32: Fit Indices of Hospital Infrastructure Dimension

χ2	*Df*	*GFI*	*AGFI*	*NFI*	*RFI*	*IFI*	*TLI*	*CFI*	*RMSEA*
12.462	2	0.954	0.932	0.920	0.923	0.928	.924	.902	0.070

The indicators of the dimension have significant loadings above standard estimation of 0.50 (Hair et al., 2008), where the loading of HI1 is 0.91 and HI3 is 0.86. The AVE and CR values are 0.52 and 0.68 respectively, which meet the minimum level of 0.50 for AVE and 0.70 for CR (Hair et al., 2008). This indicates that the hospital infrastructure dimension has convergent validity and reliability. Table 4.33 presents the Factor Loadings, Average Variance Extracted (AVE) and Construct Reliability (CR) of the hospital infrastructure dimension.

Table 4.33: CFA Results of Hospital Infrastructure Dimension

Attribute	Factor Loading	Squared Loadings	AVE	CR
HI1	.91	.82	0.52	.68
HI3	.86	.73		

The final resulting CFA model of supportive services, patient safety and patient communication dimensions has three indicators. Since these models have three indicators they are considered as just-identified models. It means these models have 0 degrees of freedom which is referred to as saturated (Hair, et al., 2008). Therefore, the overall model fit can be measured by integrating these dimensions into the overall measurement model.

However, the above results of CFA models show that each dimension has convergent validity and construct reliability. The fit indices are also in the accepted level except RMSEA value which is more than the minimum value i.e. 0.080 for three factors such as

supportive services, patient safety and patient communication. When these models are integrated into the overall measurement model, it may result in better goodness of fit indices.

4.14 HospitalQual: First-order Measurement Model

Confirmatory Factor Analysis is done on the first-order measurement model to confirm the factor structure identified in the previous section.

As recommended by Anderson & Gerbing (1988) and Hair et al., (2008), the estimation of the HospitalQual model is carried out in two stages. In the first stage, the measurement model is estimated, and in the second this same model is fixed, in order to estimate the structural model. According to Anderson & Gerbing (1988) and Hair et al., (2008), the logic behind this reasoning is that the reliability of the indicators is better represented in two stages, avoiding interaction between the measurement and structural models (Alves & Raposo 2007). The final results of CFA of each factor model are connected to develop the overall measurement model. The first-order CFA model of Seven-factorial structure of HospitalQual consists of 23 items. The schematic representation of the model is shown in figure 4.13.

The study has followed the recommendations of Byrne (2010) to test the first-order CFA model of HospitalQual structure.

- The model consisted of the identified seven factors as first-order factors
- Each item has a non-zero loading on its chosen factor and zero loadings on all other factors
- The seven factors are correlated
- The error terms associated with the each item measurements are uncorrelated

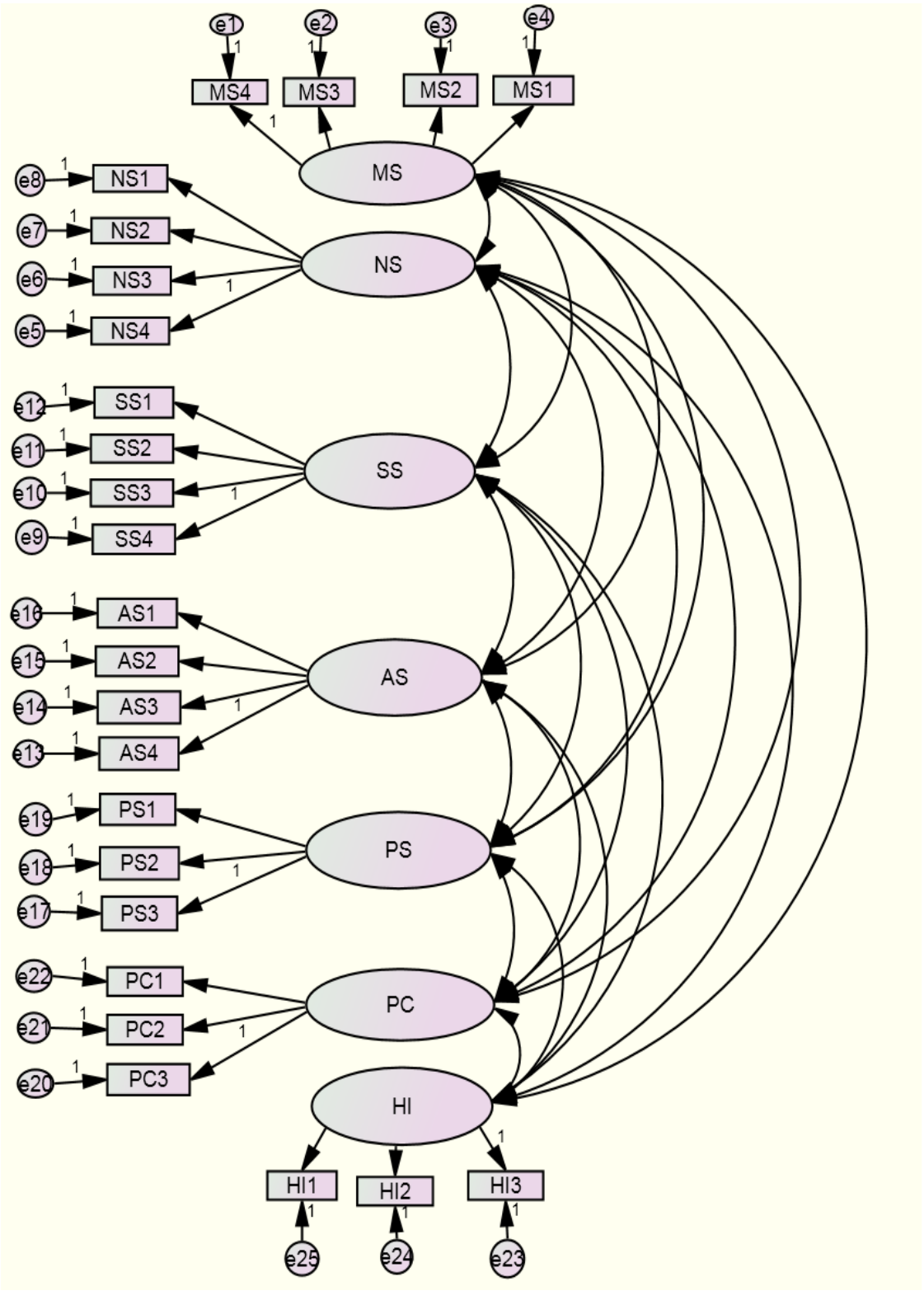

Figure 4.13: First-order Hypothesized Model of Seven Factorial Structure of HospitalQual

4.14.1 Model Summary

The study conducted the initial assessment of model summary of hypothesized model. The overall $\chi 2$ value is 1119.747 with 231 degrees of freedom at the probability level of 0.001. It can be observed that the minimum fit indices are achieved as shown in the table 4.34. This indicates that AMOS was successful in estimating all model parameters, thereby resulting in a convergent solution. Hence, the HospitalQual model is found to be fit.

4.14.2 Model Evaluation

In the process of validating the first order measurement model, however, two items: SS2-Required Medicines are available in the pharmacy and HI2-The hospital have necessary up-to-date equipment are discarded due to less standardized coefficient (< 0.50). The revised first-order measurement model with the remaining 23 items is shown in figure 4.14.

The revised model has a good model fit with a value of $\chi 2$/df ratio 4.874, indicating that the model is acceptable. The different types of fit indices are used to assess the model fit: the ratio of chi-square to degrees of freedom ($\chi 2$/df), the Goodness of Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Normed Fit Index (NFI), Tucker Lewis Index (TLI), Relative Fit Index (RFI), Incremental Fit Indices (IFI) and Root Mean Square Error of Approximation (RMSEA). Table 4.34 presents the overall evaluation of model fit with significant values indicates that the seven factor model fits well.

Table 4.34: Model Fit Summary of HospitalQual Measurement Model

χ2	*df*	*χ2/df*	*GFI*	*AGFI*	*NFI*	*TLI*	*RFI*	*IFI*	*RMSEA*
1119.747	231	4.847	0.942	0.936	0.940	0.940	0.928	.950	0.075

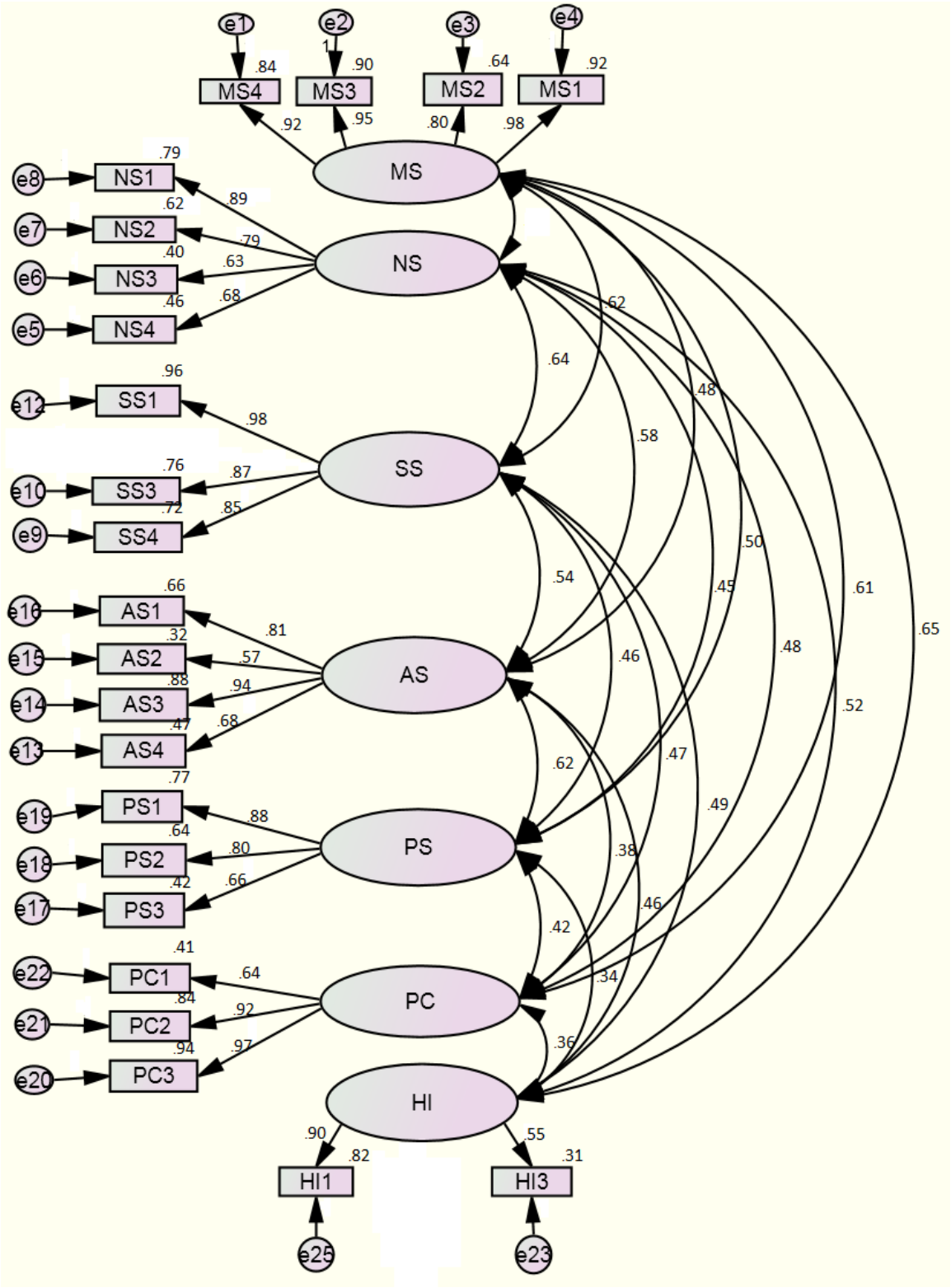

Figure 4.14: Final results of HospitalQual Measurement Model

Table 4.34 shows, the Goodness of Fit Index (GFI) value 0.942 presented by the measurement model reveals that nearly all the measures present a satisfactory level of acceptability and that the model explains 94.2 percent data variance and the Root Mean Square Error of Approximation (RMSEA) value (0.075) is between 0.03 and 0.08, indicating the model theory fits the sample data (Hair et al., 2008). Further, Average Goodness of Fit Index (AGFI), Normed Fit Index (NFI), Tucker–Lewis Index (TLI), Incremental Fit Index (IFI) and Relative Fit Index (RFI) values are above 0.90 and it indicates that the model fits well (Hu & Bentler, 1995; Hair et al., 2008).

4.15 Reliability and Validity Tests of First-order Measurement Model

The assessment of CFA model is incomplete if it is based on only fit indices. The valuation of construct validity and reliability is required for additional evidence (Hair et al., 2008). Therefore, the assessment of measurement model was done through multiple approaches: construct validity and construct reliability. The construct validity consists of face validity, convergent validity, discriminant validity, nomological validity and criterion validity (Churchill, 1979). However, the construct validities such face validity, convergent validity, discriminant validity and criterion validity retested at this level.

4.15.1 Reliability

The reliability of a measure is the extent to which it is free from random error. Construct reliability examines the internal consistency of indicators of the CFA factor. The construct reliability of the factors ranges from 0.70 to 0.95 which are equal to and above the minimum level of 0.70 (table 4.35). Thus, the reliability of the scales is found to be acceptable (Bagozzi & Yi, 1988).

4.15.2 Validity

- **Face validity**

Face (content) validity is examined at the stage of items generation from extensive literature and by adopting changes and suggestions from various experts such hospital administrators, personnel of quality department, patient care executives and academia.

- **Convergent Validity**

Convergent validity is assessed by three measures: Standardized Coefficients (factor loadings) of the seven latent variables, Average Variance Extracted (AVE) and Construct

Reliability (CR) for each latent variable. From the table 4.35, it can be observed that all the indicators are statistically significant at a level of significance of 0.001, which shows that they are significantly related to their specific (or respective) constructs. It can also be observed that all the standard estimates are above 0.50 (ranging from 0.55 to 0.98), correspondent to a standard estimation of at least 0.50 (Hair et al., 2008). It can be further observed from the table 4.35 that the AVE value of each construct exceeds the minimum level 0.50. It indicates measured variables of concern construct are sharing a high proportion of variance in common (Hair et al., 2008).

Table 4.35: AMOS results of Measurement Model

			Standardised Estimates	**C.R#**	**P**	**AVE**	**CR**
MS4	<---	MS	0.92	**		0.83	0.95
MS3	<---	MS	0.95	52.55	***		
MS2	<---	MS	0.80	32.93	***		
MS1	<---	MS	0.98	60.28	***		
NS4	<---	NS	0.68	**		0.56	0.83
NS3	<---	NS	0.63	17.39	***		
NS2	<---	NS	0.79	26.11	***		
NS1	<---	NS	0.89	26.10	***		
SS4	<---	SS	0.85	**		0.76	0.90
SS3	<---	SS	0.87	29.62	***		
SS1	<---	SS	0.98	51.28	***		
AS4	<---	AS	0.68	**		0.58	0.84
AS3	<---	AS	0.94	21.70	***		
AS2	<---	AS	0.57	21.07	***		
AS1	<---	AS	0.81	30.06			
PS3	<---	PS	0.66	**		0.61	0.82
PS2	<---	PS	0.80	254.59	***		
PS1	<---	PS	0.88	51.65	***		
PC3	<---	C	0.97	**		0.76	0.88
PC2	<---	C	0.92	37.11	***		
PC1	<---	C	0.64	21.65	***		
HI3	<---	I	0.55	**		0.55	0.70
HI1	<---	I	0.90	14.95	***		

Note: *** significant at the 0.001 level (two-tailed)

** The critical ratio is not available, because the regression weights are fixed at 1

$CR_{\#}$ = Critical Ratio; AVE= Average variance Extracted; CR=Construct Reliability

- **Discriminant Validity**

Discriminant validity refers to the extent to which a construct is truly distinct from other constructs (i.e., unidimensional). Discriminant validity is checked with the comparison of variance extracted (VE) estimates for each construct with the squared inter-construct correlations (SIC) associated with that construct. All the extracted variance estimates are greater than squared inter-construct correlations, meaning that each construct is unique and captures some experience which other measures do not as shown in the table 4.36.

Table 4.36: First order Measurement Model results - AVE and Squared Inter Construct Correlation (SIC) for Discriminant validity

	MS	NS	SS	AS	PS	PC	HI	AVE
MS	*							0.830
NS	0.4356	*						0.560
SS	0.3844	0.4096	*					0.760
AS	0.2304	0.3364	0.2916	*				0.580
PS	0.25	0.2025	0.2116	0.3844	*			0.610
PC	0.3721	0.2304	0.2209	0.1444	0.1764	*		0.760
HI	0.4225	0.2704	0.2401	0.2116	0.1156	0.1296	*	0.550
AVE	0.830	0.560	0.760	0.580	0.610	0.760	0.550	

- **Criterion Validity**

Finally, criterion validity is measured which refers to the extent to which the factors measured are related to pre-specified criteria. The multiple regression analysis of a dependent variable (overall inpatient service quality) is conducted to assess the criterion validity of the derived dimensions. The average scores of each dimension are entered as independent variables. The overall model for multiple regression equation is fit ($F=18.085$) at $p = 0.000$. All the seven dimensions are positive and significantly related with the overall inpatient service quality as shown in the table 3.37.

Table 4.37: Regression Analysis results between Overall Inpatient Service Quality and Seven Dimensions for Criterion Validity

Dimensions	Standardized Coefficients Beta	t	Sig.
MS	.148	4.213	.000
NS	.179	5.245	.000
SS	.136	5.368	.000
AS	.155	4.596	.000
PS	.072	0.294	.043
PC	.078	2.243	.025
HI	.048	9.530	.004

The model fit, reliability and validity tests are evidence that the first-order CFA model of HospitalQual is considerably fit and the variables are significant measures of the respective factors. The final results of HospitalQual first-order CFA model consists of seven factors and 23 items and it has supported the hypotheses framed at the beginning of the analysis. The model identifies seven factors as first order factors; each item has a nonzero loading on its chosen factor and zero loadings on all other factors; the seven factors are correlated and the error terms associated with each item measurements are uncorrelated.

4.16 Relative Importance of the HospitalQual Factors

The relative importance of the factors can be found by examining the standardized or unstandardized coefficient values. Based on the standardized coefficient values, the table 4.38 shows the rank order of the independent variables of HospitalQual. The inpatient evaluation of overall service quality is strongly affected by the nursing service quality, followed by administrative, medical, supportive services, patient communication, patient safety and hospital infrastructure. It can be observed that the administrative service quality is the second factor which affect the inpatient evaluation of overall service quality followed by medical service quality.

Table 4.38: Relative Importance of HospitalQual Dimensions

Dimensions	Standardized Coefficients Beta
NS	.179
AS	.155
MS	.148
SS	.136
PC	.078
PS	.072
HI	.048

4.17 HospitalQual: Second-order Measurement Model

The second-order measurement model of HospitalQual is developed by assuming that all first-order latent constructs are integrated into one second-order latent construct called Inpatient Service Quality (IPSQ). This assumption is proposed by Parasuraman et al., (1988), stating that there exists a single overall service quality construct. Based on this, the present study develops a second-order factor structure of the HospitalQual measurement model. The study has followed the recommendations of Byrne (2010) to develop the HospitalQual second-order model.

- Service quality is a multidimensional construct;
- Responses to service quality can be explained by first-order factors (MS, NS, SS, AS, PS, PC and HI) and one second order factor (IPSQ);
- Each item has a nonzero loading on the first-order factor, it is designed to measure, and zero loadings on the other first-order factors;
- Error terms associated with each item are uncorrelated and
- Co-variation among the six first-order factors is explained fully by their regression on the second-order factor.

4.17.1 Model Assessment

The results of CFA of second-order measurement model are shown in the figure 4.15 and table 4.39. All the first-order factor loadings are significantly loaded onto second-order inpatient service quality construct. The regression weights range from 0.60 to 0.86.

Table 4.39: Results of Second-order HospitalQual CFA Model

Second Order Factor	First-Order Factors	Standardized Coefficient	R^2	P	AVE	CR
In-Patient Service Quality (IPSQ)	Medical Service (MS)	0.86	0.74	***	0.52	0.88
	Nursing Services (NS)	0.78	0.6	***		
	Supportive Services (SS)	0.71	0.5	***		
	Administrative Services (AS)	0.79	0.62	***		
	Patient Communication (PC)	0.68	0.46	***		
	Patient Safety (PS)	0.62	0.38	***		
	Hospital Infrastructure (HI)	0.60	0.36	***		

Note: * Standard second-order loading is the standard regression weight of each of the first-order factor's loading onto the Inpatient Service Quality (IPSQ) construct. Figures in parentheses are critical ratios from the unstandardized solutions.
****** The critical ratio is not available, because the regression weight of the first component factor (i.e. teaching) is fixed at 1.
******* Significant at Probability level 0.001
R^2 = squared standard regression weight; AVE = Average Variance Extracted;
CR = Construct Reliability

Table 4.40 shows the second order measurement model fit indices. The $\chi 2$= 61.713, df= 14 and $\chi 2$/df = 4.408. The other fit indices RMSEA= 0.064 and GFI, AGFI, NFI, TLI, RFI, and the IFI are above 0.90. It indicates that the second-order HospitalQual measurement model has a good fit. Once the fit indices are found to be at an acceptable level, the study proceeded to analyze the validity of the second order construct. The convergent validity measured through the standard estimates of the first order indicators and variance is above 0.50 and the construct reliability value exceeded the recommended level of 0.70.

Table 4.40: Model Fit Summary of HospitalQual

χ2	*df*	*χ2/df*	*GFI*	*AGFI*	*NFI*	*TLI*	*RFI*	*IFI*	*RMSEA*
61.713	14	4.408	0.980	0.961	0.950	0.954	0.938	.952	0.064

The results of the confirmatory factor analysis, reliability and validity indicate that the measurement model of HospitalQual is fit for measuring inpatient service quality in hospitals. The figure 4.15 shows the HospitalQual Second-order CFA model.

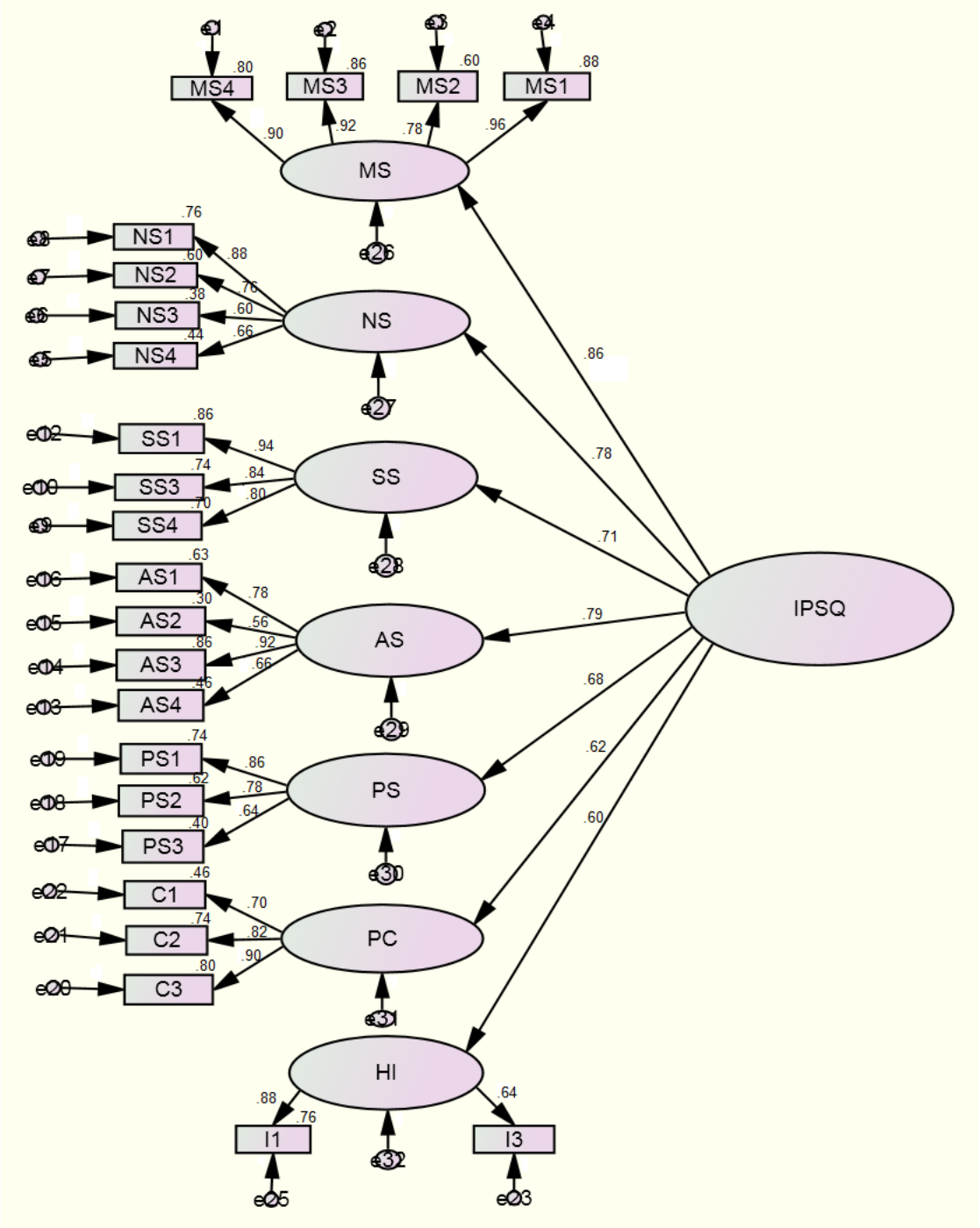

Figure 4.15: HospitalQual Second-order CFA model

SECTION 3
DEVELOPMENT OF STRUCTURAL MODEL

Structural theory refers to the conceptual representation of the relationships between the constructs expressed in the form of structural equations and is usually depicted in a visual diagram. In this section, the structural model is developed to identify the relationships among the constructs of In-Patient service quality (IPSQ), In-Patient satisfaction (IPSt) and In-Patient loyalty (IPL). Initially, the CFA measurement model is developed and in the next step the measurement model of latent constructs is fixed into the structural model to test the hypothesized relationships among the constructs.

4.18 Confirmatory Factor Analysis of Latent Constructs

4.18.1 CFA of In-Patient Satisfaction

The construct In-Patient Satisfaction (IPSt) is measured through seven observed variables. They are: PSMS - Patient Satisfaction with the Medical Service, PSNS - Patient Satisfaction with the Nursing Services, PSSS - Patient Satisfaction with the Supportive Services, PSAS - Patient Satisfaction with the Administrative Services, PSPS - Patient Satisfaction with the Patient Safety, PSPC - Patient Satisfaction with the Patient Communication and PSHI - Patient Satisfaction with the Hospital Infrastructure. The schematic representation of CFA model of inpatient satisfaction (factor) is shown in figure 4.16.

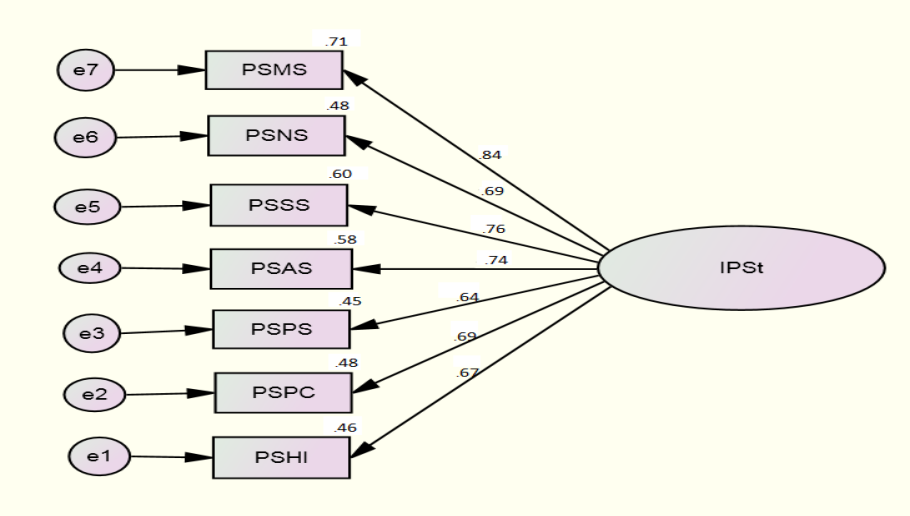

Figure 4.16: CFA Model of In-Patient Satisfaction

From the observation of the AMOS output as shown in the figure 4.41, the CFA of inpatient satisfaction having seven observed variables which are high and significantly loaded. The table 4.41 provides the Average Variance Extracted (AVE = 0.52) and Construct Reliability (CR= 0.88) of the construct. It indicates that the construct Inpatient satisfaction (IPSt) has convergent validity and construct reliability.

Table 4.41: CFA Results of In-Patient Satisfaction

Attribute	Factor Loading	Squared Loadings	AVE	CR
PSMS	.84	0.70	.52	.88
PSNS	.69	0.47		
PSSS	.76	0.57		
PSAS	.74	0.54		
PSPS	.64	0.40		
PSPC	.69	0.47		
PSHI	.67	.44		

Table 4.42 below shows the fit indices of Inpatient satisfaction construct. All the fit indices are above 0.90 and the RMSEA value is below 0.08 indicating that the model is sufficiently fit.

Table 4.42: Model Fit Summary of In-Patient Satisfaction

χ2	*df*	*χ2/df*	*GFI*	*AGFI*	*NFI*	*TLI*	*RFI*	*IFI*	*RMSEA*
61.713	14	4.408	0.980	0.961	0.950	0.954	0.938	.952	0.064

4.18.2 CFA of In-Patient Loyalty

The construct, In-Patient Loyalty (IPL) is measured through three observed variables: SP1 - I prefer to avail the services from this hospital if I need in future, PL 2 - I suggest this hospital to my family members if they require the services and PL3 - I refer this hospital to my friends/relatives/colleagues. The figure 4.17 shows the CFA model of Inpatient loyalty. All the variables are significantly loaded on the construct. The construct reliability and convergent validity are shown in the table 4.43

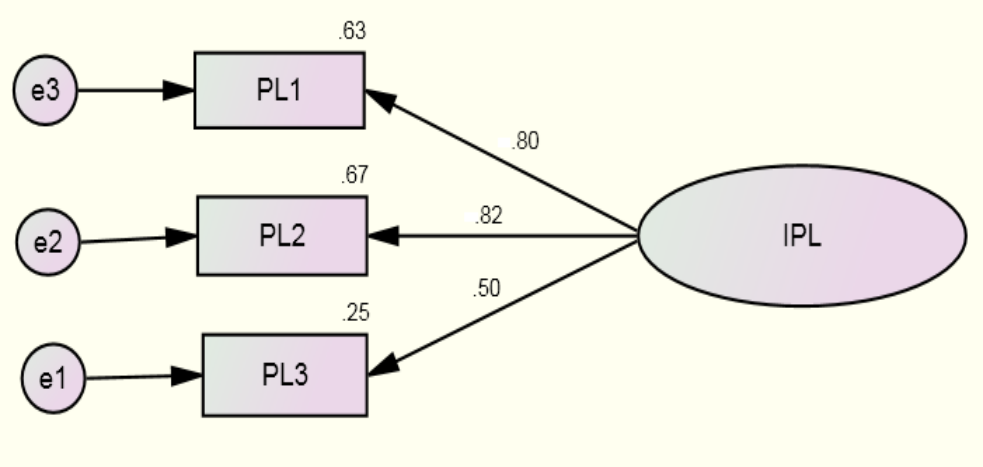

Figure 4.17: CFA Model of In-Patient Loyalty

The figure 4.17 shows the final output of CFA of Inpatient loyalty having three observed variables which are significantly loaded. The table 4.43 presents the average variance extracted (AVE = 0.52) and construct reliability (CR= 0.75) of the construct. It indicates that the construct Inpatient Loyalty (IPL) has convergent validity and construct reliability.

Table 4.43: CFA Results of In-Patient Loyalty

Attribute	Factor Loading	Squared Loadings	AVE	CR
IPSt1	.80	0.64	.52	.75
IPST2	.82	0.67		
IPSt3	.50	0.25		

Table 4.44 shows the fit indices of inpatient loyalty construct**.** All the fit indices are above 0.90 and the RMSEA value is below 0.08 indicating that the model is sufficiently fits.

Table 4.44: Model Fit Summary of In-Patient Loyalty

χ2	*df*	*χ2/df*	*GFI*	*AGFI*	*NFI*	*TLI*	*RFI*	*IFI*	*RMSEA*
61.713	14	4.408	0.980	0.961	0.950	0.954	0.938	.952	0.064

4.19 CFA of Measurement Model's Latent Constructs

The measurement model is developed by integrating the results of a CFA of latent constructs. The figure 4.18 shows the schematic representation of the final measurement model of latent constructs.

4.19.1 Model Fit Assessment

The table 4.45 presents the model fit indices of the measurement model of latent constructs. The χ2/df value of 2.997 indicates that the model is acceptable. All fit indices are at an accepted level i.e. above 0.90. The RMSEA value is less than 0.08 indicates the model theory fits the sample data (Hair et al., 2008).

Table 4.45: Model Fit Summary of Measurement Model of Latent Constructs

χ2	*df*	*χ2/df*	*GFI*	*AGFI*	*NFI*	*TLI*	*RFI*	*IFI*	*RMSEA*
347.621	116	2.997	0.950	0.935	0.917	0.900	0.910	.908	0.049

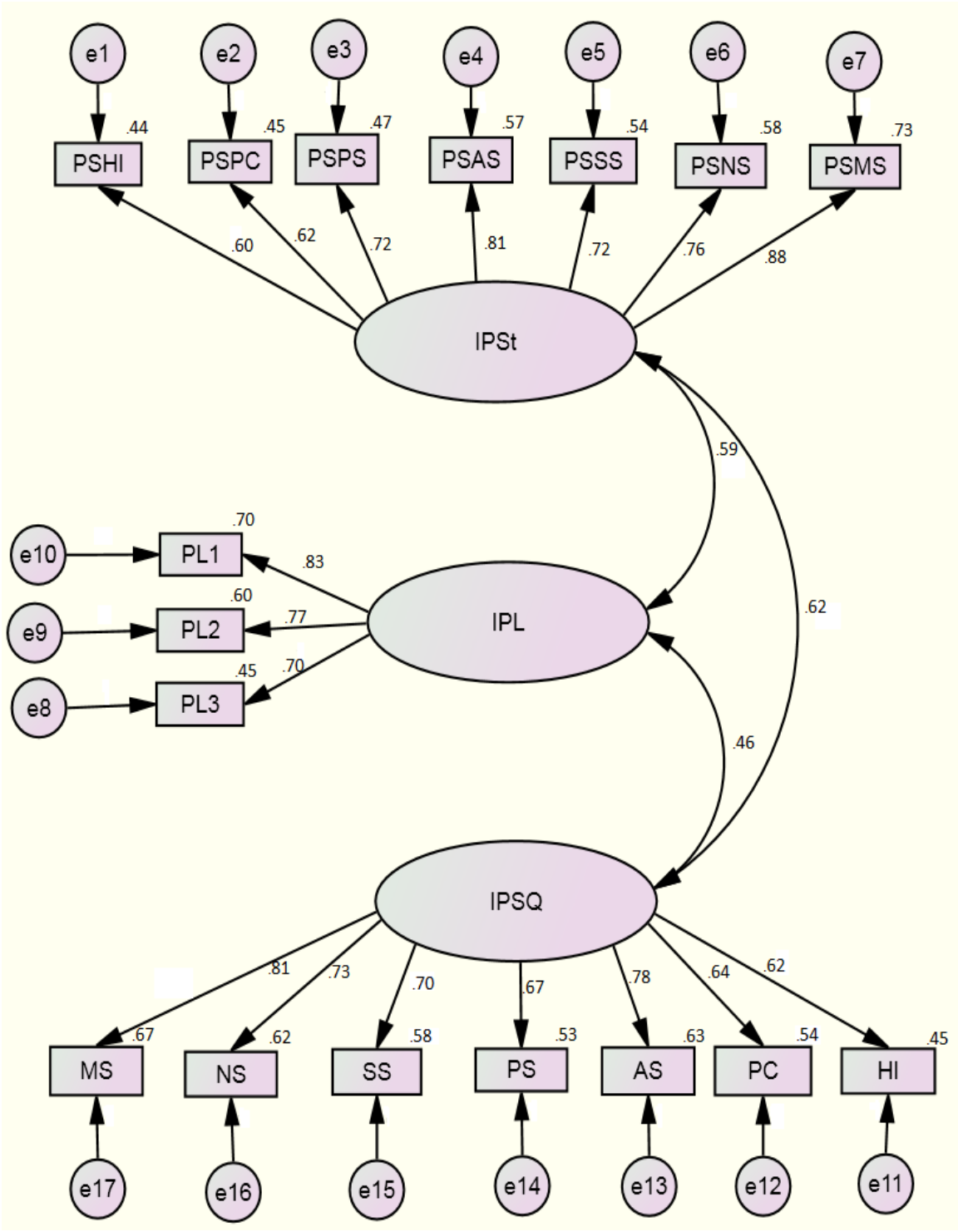

Figure 4.18: Final Measurement model of Latent Constructs

Table 4.46: AMOS results of Measurement Model of Latent Constructs

			Estimate	Standardised Estimates	C.R#	Sig.	AVE	CR
HI	<---	IPSQ	1	0.62	**		0.50	0.87
PC	<---	IPSQ	0.34	0.64	-0.73	0.46		
AS	<---	IPSQ	1.04	0.67	2.23	0.02		
PS	<---	IPSQ	1.60	0.78	-2.66	0.00		
SS	<---	IPSQ	0.33	0.70	0.76	0.44		
NS	<---	IPSQ	6.66	0.73	2.82	0.00		
MS	<---	IPSQ	1.04	0.81	2.02	0.04		
PSMS	<---	IPSt	1	0.88	**		0.54	0.89
PSNS	<---	IPSt	1.78	0.76	5.38	***		
PSSS	<---	IPSt	0.73	0.72	3.34	***		
PSPS	<---	IPSt	2.42	0.72	5.88	***		
PSAS	<---	IPSt	1.69	0.81	5.02	***		
PSPC	<---	IPSt	1.05	0.62	4.15	***		
PSHI	<---	IPSt	1.86	0.60	5.02	***		
PL1	<---	IPL	1	0.83	**		0.59	0.81
PL2	<---	IPL	0.87	0.77	15.28	***		
PL3	<---	IPL	0.40	0.70	10.85	***		

Note: *** significant at the 0.001 level (two-tailed)
** The critical ratio is not available, because the regression weights are fixed at 1
$CR_{\#}$ = Critical Ratio; AVE= Average variance Extracted; CR=Construct Reliability

4.19.2 Validity and Reliability

The validity of the measurement model is assessed based on convergent validity and nomological validity. The table 4.46 presents the significant standard loadings of latent constructs, Average Variance Extracted (AVE) and Construct Reliability (CR). All the constructs have significant standardized loadings and AVE values are above the minimum required criteria i.e. 0.050. The construct reliability values are also above 0.70 for all the constructs. It indicates that the constructs have convergent validity.

Discriminant Validity

Discriminant validity refers to the extent to which a construct is truly distinct from other constructs (i.e., unidimensional). Discriminant validity was checked with the

comparison of Average Variance Extracted (AVE) estimates for each construct with the Squared Inter-construct Correlations (SIC) associated with that construct. All the extracted variance estimates are greater than Squared Inter-construct Correlations, meaning that each construct is unique and captures some experience which other measures do not (Table 4.47).

Table 4.47: First-order Measurement Model Results: AVE and Squared Inter-Construct Correlations (SIC) for Discriminant validity

	IPSt	IPL	IPSQ	AVE
IPSt	*			0.540
IPL	0.3481	*		0.590
IPSQ	0.3844	0.2116	*	0.500
AVE	0.540	0.590	0.500	

Nomological Validity

The nomological validity is tested by examining whether the Pearson Product-Moment Correlations between the constructs in a measurement model make sense. From Table 4.48, it can be seen that all the correlations are positive and statistically significant. It indicates that the constructs have nomological validity.

Table 4.48: First-order Measurement Model Results: Construct Correlations with Significance Level for Nomological Validity

			Estimate	S.E.	C.R.	P
IPSQ	<-->	IPSt	.011	.004	2.389	.017
IPSQ	<-->	IPL	.066	.023	2.842	.004
IPSt	<-->	IPL	.062	.015	4.208	***

4.20 Final Structural Equation Model (SEM)

The schematic representation of the HospitalQual structural equation modeling is shown in the figure 4.19. The research model proposed in the study consists of the relationships among the constructs. The objective of this model is to develop a comprehensive multi-level model that evaluates the relationships between inpatient service quality, satisfaction and loyalty. Table 4.45 presents the results of structural equation modeling for the Research Model. It can be seen in the table that all the fit indices are above 0.90 and RMSEA value is 0.049 which indicates the Research Model has a good fit.

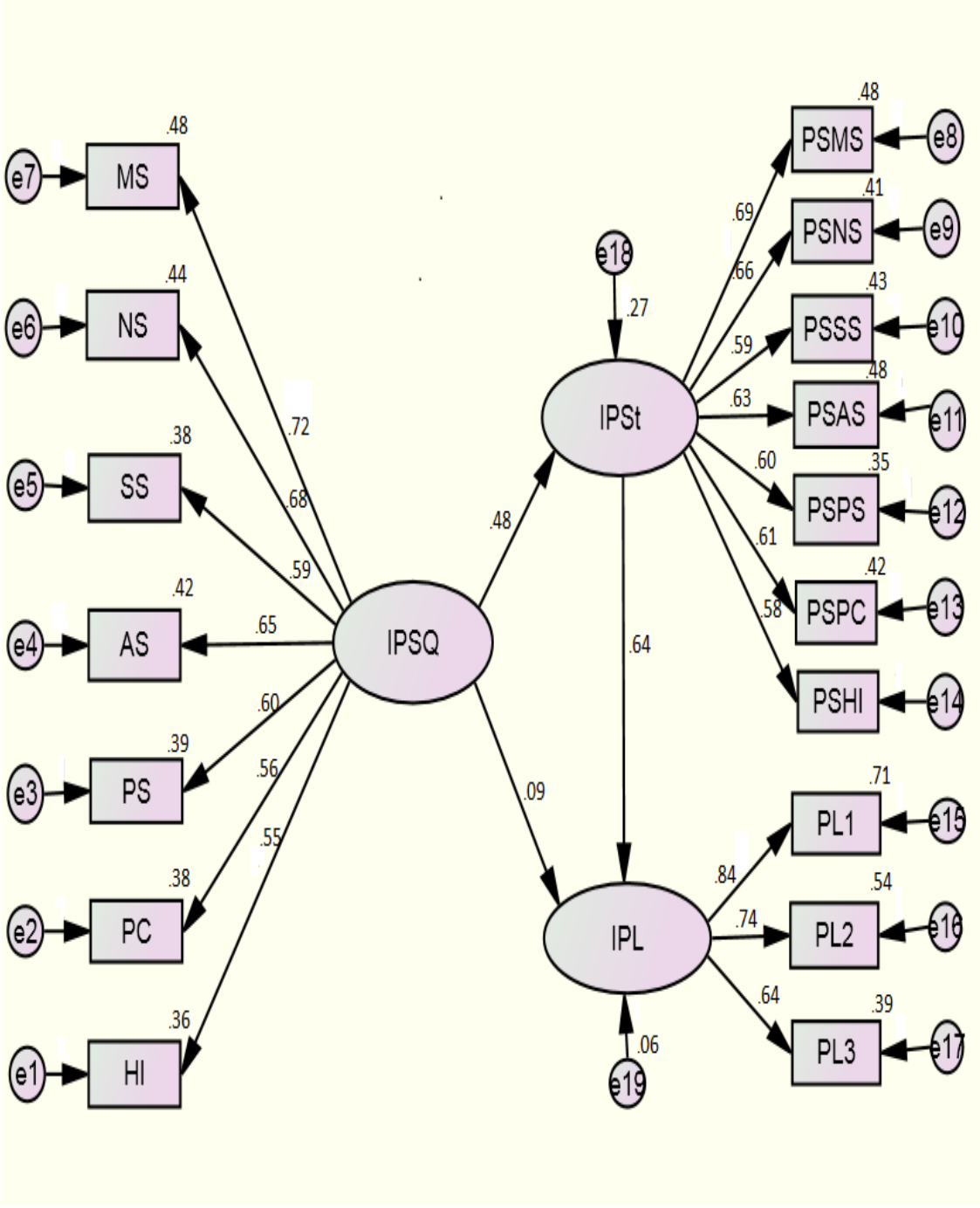

Figure 4.19: HospitalQual Structural Model

Note: MS-Medical Service; NS-Nursing Services, SS-Support Services; PS-Patient Safety; AS - Administrative Service; PC – Patient Communication; HI- Hospital Infrastructure; IPSQ-In-Patient service quality; IPSt- In-Patient Satisfaction; IPL- In-Patient loyalty; PSMS – Patient Satisfaction with Medical Service; PSNS-Patient Satisfaction with Nursing Services; PSSS- Patient Satisfaction with Supportive Services; PSPS-Patient Satisfaction with Patient Safety; PSAS-Patient Satisfaction with Administrative Services; PSPC-Patient Satisfaction with Patient Communication; PSHI-Patient Satisfaction with Hospital Infrastructure; PL- Patient Loyalty.

4.21 Results of Hypotheses Testing (H8 to H10)

The present study tested the hypotheses from H8 to H10 based on the results of the above structural model. The model incorporates three hypothesized relationships among the latent constructs. Two hypotheses are related to the direct relationship between inpatient service quality, inpatient satisfaction and inpatient loyalty and the third one related to the indirect relationship between inpatient service quality and inpatient loyalty. The results of the hypotheses are shown in the table 4.49.

Table 4.49: Results of Hypotheses Testing for Research Model based on SEM

				Standardized path Estimate	Estimate	S.E.	C.R.	P
H8	IPSt	<---	IPSQ	.434	.916	.356	2.576	.010
H9	IPL	<---	IPSQ	.006	.026	.338	.078	.938
H10	IPL	<---	IPSt <---IPSQ	.636	5.687	1.988	2.860	004

Hypotheses 8: In-Patient Service Quality (IPSQ) has a significant effect on In-Patient satisfaction (IPSt)

The results of structural model are shown in the table 4.49. The hypothesized path from inpatient service quality to inpatient satisfaction is significant at the 0.01 level and the standardized coefficient is 0.434. Therefore, the hypothesis that the inpatient service quality has a significant effect on patient satisfaction is supported.

Hypotheses 9: In-Patient Service Quality (IPSQ) has a significant effect on In-Patient Loyalty (IPL)

As results shown in table 4.49, the hypothesized path from inpatient service quality to inpatient loyalty is insignificant at the 0.01 level and the standardized coefficient is 0.006. Hence, the hypothesis that inpatient service quality has a significant effect on inpatient loyalty is not supported.

Hypothesis 10: In-Patient Service Quality (IPSQ) has a significant indirect effect on In-Patient Loyalty (IPL)

As shown in the table 4.49 the hypothesized path between inpatient satisfaction and inpatient loyalty is significant at the 0.01 level and the standardized coefficient is 0.636. Hence, the hypothesis In-Patient service quality (IPSQ) has an indirect effect on In-Patient Loyalty (IPL) through In-Patient Satisfaction (IPSt) is supported.

The final results of the hypotheses are shown in the following table 4.50.

Table 4.50: Final Results of Hypotheses Testing

Hypothesis	Relationship	P value	Hypothesis result
H8	IPSQ ⟶ IPSt	.010*	Supported
H9	IPSQ ⟶ IPL	.938	Not Supported
H10	IPSQ ⟶ IPSt ⟶ IPL	.004*	Supported

Note: * Significant at 0.01 level (two-tailed).

SECTION 4

COMPARISON OF PUBLIC AND PRIVATE HOSPITALS

The study compares the overall In-Patient Services Quality, In-Patient Satisfaction and In-Patient Loyalty in Public and Private Hospitals. The following formulated hypotheses are tested using t test.

Table 4.51: Hypothesis from H11 to H13

H.no	Hypothesis
H11	There is a significant difference between public and private hospitals with regard to Overall Inpatient Service Quality
H12	There is a significant difference between public and private hospitals with regard to In-Patient Satisfaction
H13	There is a significant difference between public and private hospitals with regard to In-Inpatient Loyalty.

4.22 Overall In-Patient Service Quality

To compare the mean response of both public and private hospitals regarding the inpatient overall service quality construct based on inpatient perceptions, an independent t-test is performed. As shown in the group statistics in the table 4.52 the responses of 412 inpatients from public and private hospitals are utilized for the analysis. The mean scores of private and public hospital are 4.39 and 3.36 respectively.

Table 4. 52: Overall inpatient service quality - Group Statistics

	Type of Hospital	N	Mean	Std. Deviation	Std. Error Mean
OIPSQ	Private	412	4.39	.593	.029
	Public	412	3.36	1.354	.067

Hypothesis 11: There is a significant difference between public and private hospitals with regard to Overall In-Patient Service Quality.

The results of t-test as shown in table 4.55 indicate that the p value is .000 which is significant at the 0.01 level. Therefore the overall inpatient service quality is significantly different in public and private hospitals. Hence, the hypothesis (H11) is supported.

Table 4. 55: Overall inpatient service quality - Independent Samples Test

		t-test for Equality of Means						
							95% Confidence Interval of the Difference	
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
OIPSQ	Equal variances assumed	14.170	822	.000	1.032	.073	.889	1.174
	Equal variances not assumed	14.170	562.922	.000	1.032	.073	.889	1.175

4.23 In-Patient Satisfaction

The study also compared the mean response of both public and private hospitals regarding inpatient satisfaction using t-test. As shown in the group statistics, the mean value of satisfaction in private hospital (4.38) is greater than the public hospital (3.78). The table 4.56 provides the group statistics of public and private hospitals.

Table 4.56: Inpatient satisfaction - Group Statistics

	Typeof Hospital	N	Mean	Std. Deviation	Std. Error Mean
IPSt	Private	412	4.38	.606	.030
	Public	412	3.78	.903	.044

Hypothesis12: There is a significant difference between public and private hospitals with regard to In-Patient Satisfaction.

The table 4.57 provides that the results of t-test about the comparison of inpatient patient satisfaction in public and private hospitals. The p value is .000 which is significant at 0.01 level. Therefore, there is a significant difference between public and private hospitals with regard to inpatient patient satisfaction. Hence, the hypothesis (H12) is supported.

Table 4.57: Inpatient satisfaction - Independent Samples Test

		t-test for Equality of Means						
							95% Confidence Interval of the Difference	
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
IPSt	Equal variances assumed	11.235	822	.000	.602	.054	.497	.707
	Equal variances not assumed	11.235	719.240	.000	.602	.054	.497	.707

4.24 In-Patient Loyalty

Apart from the overall inpatient service quality and inpatient satisfaction, the study also compares the mean response of both public and private hospitals regarding the inpatient loyalty. As shown in the group statistics table 4.58 the mean scores of private and public hospital are 3.47 and 3.38 respectively.

Table 4.58:In-Patient Loyalty - Group Statistics

	Type of Hospital	N	Mean	Std. Deviation	Std. Error Mean
PL	Private	412	3.47	1.136	.056
	Public	412	3.38	1.139	.056

Hypothesis 13: There is a significant difference between public and private hospitals with regard to In-Patient Loyalty.

The result of t-test as shown in table 4.59 indicates that the p value is .000 which is significant at the 0.01 level. Therefore, there is a significant difference between public and private hospitals with regard to inpatient loyalty. Hence, the hypothesis (H13) is supported.

Table 4.59: In-Patient Loyalty - Independent Samples Test

		t-test for Equality of Means			
		t	df	Sig. (2-tailed)	Mean Difference
IPL	Equal variances assumed	5.675	822	.000	.444
	Equal variances not assumed	5.675	821.570	.000	.444

4.25 Results of Hypothesis testing (H11 to H13)

The table 4.60 presents the summary of hypothesis from H11 to H13 with their respective probability value and result of the test.

Table 4.60: Results of Hypothesis testing (H11-H13)

H.no	Hypothesis	t value	Result
H11	There is a significant difference between public and private hospitals with regard to Overall In-Patient Service Quality	.000	Supported
H12	There is a significant difference between public and private hospitals with regard to In-Patient Satisfaction.	.000	Supported
H13	There is a significant difference between public and private hospitals with regard to In-Patient Loyalty	.000	Supported

4.26 Summary

The first section of the chapter demonstrates the process of developing the HospitalQual theoretical model which includes the development of the survey questionnaire. The exploratory factor analysis resulted in seven critical factors of inpatient service quality in the hospitals. Multiple regression analysis is performed to test the hypotheses about the significant effect of extracting critical factors i.e. medical service, nursing services, support services, administrative services, patient safety, patient communication and hospital infrastructure on overall inpatient service quality in the hospitals. The test proved that all the seven factors have a significant effect on inpatient service quality. In addition, the nursing services are found to be the most important factor to predict the overall service quality, followed by administrative, medical, supportive services, patient communication, patient safety and hospital infrastructure.

The theoretical model developed in section 1 has been tested in section 2 using Confirmatory Factor Analysis (CFA). The first-order measurement model is developed and contained a total of 23 items with seven factors. The second-order measurement model is developed conjoining the first-order factors into one second order factor i.e. Inpatient Service Quality (IPSQ). In section 3, the overall measurement model is developed by the three constructs: In-Patient Service Quality (IPSQ), In-Patient

Satisfaction (IPSt) and In-Patient Loyalty (IPL), and tested the validity and reliability. The hypotheses H8 and H10 are supported and H9 is not supported. It indicates that the inpatient service quality has a direct effect on inpatient satisfaction and indirect effect on the inpatient loyalty through inpatient satisfaction. The last section compares the inpatient service quality, inpatient satisfaction and inpatient loyalty in private and public hospitals by using t test. The results found that H11, H12 and H13 are supported.

Chapter 5

DISCUSSION AND CONCLUSIONS

The study evaluates inpatient service quality and the relationship between inpatient service quality, inpatient satisfaction and inpatient loyalty in select public and private hospitals. Increased attention on competition among hospitals and increased expectations of patients about the service quality has led to the present study. Given the need and importance for a deeper understanding of service quality in hospitals, it motivated the researcher to initiate the study. The study evaluates the service quality based on the perceptions of inpatients and examines the relationship with inpatient satisfaction and inpatient loyalty. The present chapter presents an objective wise discussion of the results followed by recommendations and observations. Later, the contributions and limitations of the study are discussed and some future research avenues suggested.

The aim of this study is to develop an inpatient measurement instrument called HospitalQual and examine the relationships between the inpatient service quality, inpatient satisfaction and inpatient loyalty in public and private hospitals.

The present study is organized into five chapters. The outline of the research is presented in the first chapter while the second chapter reviews the service quality models, the literature related various studies related to service quality across the globe and examines the relationship between service quality, satisfaction and loyalty. The research methodology and data collection methods are discussed in the third chapter. Fourth chapter provides an in-depth data analysis in four sections. Final chapter, the present one deals with the discussion and conclusions that are arrived from the study.

The survey questionnaire is used to obtain the quantitative data to test the proposed hypotheses. The valid data from 1070 respondents (n_1 = 246 + n_2 = 824) has obtained from inpatients of select hospitals, which includes three public and three private hospitals located in Hyderabad, Andhra Pradesh. Factor analysis, multiple regression and t test

using Statistical Package for the Social Sciences (SPSS 18.00) and Structural Equation Modeling (SEM) with Analysis of Moment Structures (AMOS) software are used in the study to test the hypothesized relationships.

5.1 Discussion of Research Findings

This section discusses the research findings corresponding to the objectives.

Objective 1: to develop a HospitalQual theoretical model by identifying the variables and factors which measure inpatient perceived service quality in public and private hospitals.

The objective is investigated by conducting qualitative and quantitative research. The qualitative research involves conducting a review of literature, including a conceptual research review in selection of variables to measure service quality. The investigation also involved in-depth interviews to refine the variables. The results identified 51 items (variables) which measure inpatient service quality provided by the public and private hospitals from patients' perspective. The pilot study, followed by expert opinion, further pruned the number of items to 39 while finalizing the questionnaire. The large scale data have collected from select hospitals using the final questionnaire. The total data collected n=1070 is split into two samples $n_1 = 246$ and $n_2 = 824$.

Exploratory Factor Analysis (EFA) is conducted using the sample $n_1 = 246$ to identify the critical factors which measure inpatient perceived service quality in hospital. Factor analysis is a multivariate analysis technique that determines underlying factors in a set of correlated items (Hair et al., 2003; Nannually & Bernstein 1994). EFA is found to be the most appropriate method to identify the quality domains and pertinent correlated items. The process of EFA in this research involved five key steps which are pre-analysis checks, sampling adequacy, factor extraction, factor rotation and factor interpretation. Finally, a seven factors with 25 items HospitalQual theoretical model emerged out of this analysis. The seven critical factors are: 1. Medical Service 2. Nursing Services 3.

Supportive Services 4. Administrative Services 5. Patient Safety 6. Patient Communication 7. Hospital Infrastructure.

Objective 2: To test what extent the inpatient service quality factors are predicting the overall service quality in hospitals

Multiple regression used to achieve this objective as presented in the section 1 of the fourth chapter. Multiple regression is a multivariate analysis technique used to assess the relationship between one dependent variable and several independent variables. This is the most commonly used technique in most social sciences research. In second objective, the researcher wants to predict the overall service quality in hospitals based on factors such as Medical Service (MS), Nursing Services (NS), Supportive Services (SS), Administrative Services (AS), Patient Safety (PS), Patient Communication (PC) and Hospital Infrastructure (HI) in order to test the hypotheses framed from the conceptual model 1. The results of multiple regression prove that all the seven inpatient service quality factors significantly predicting the overall inpatient service quality in hospitals. Therefore, all the hypotheses (H_1, H_2, H_3, H_4, H_5, H_6 and H_7) are accepted.

In addition, from the results of multiple regression it is found that nursing services followed by administrative, medical, supportive services, patient communication, patient safety and hospital infrastructure are significant effect on inpatient service quality.

Objective 3: To validate the identified inpatient service quality variables and factors by developing a HospitalQual measurement model

.

This objective is met by measuring all the inpatient service quality factors, along with the service quality variables through Confirmatory Factor Analysis (CFA). Section 2 of the fourth chapter presents the development of HospitalQual measurement using sample n_2 = 824. Individual CFA models are developed to determine the reliability, validity and fit for all the seven dimensions of inpatient perceived service quality. First-order HospitalQual measurement model is developed by connecting all the factors and tested with fit indices.

Two variables which are not loaded properly onto the factors are deleted which resulted in the evolvement of a HospitalQual measurement model consisting of seven latent factors and 23 indicators (variables). The second-order HospitalQual measurement model is developed and tested by integrating all the seven latent factors.

Objective 4: To examine the relationships between inpatient service quality, patient satisfaction and loyalty using structural equation modeling.

The analysis is presented in the section three of the fourth chapter. The conceptual model 2 examines the relationship between the In-Patient Service Quality (IPSQ), In-Patient Satisfaction (IPSt) and In-Patient loyalty (IPL). The hypotheses from H_8 to H_{10} are tested and the hypothesis H_8 and H_{10} are found to be significant except the H_9 direct relationship between In-Patient Service Quality and In-Patient Loyalty. The hypothesis H_9 (In-Patient Service Quality has a significant effect on In-Patient Loyalty) is not supported and the hypotheses H_8 and H_{10} are supported.

The hypothesis H_8 i.e. In-Patient Service Quality (IPSQ) has a significant effect on In-Patient Satisfaction (IPSt) is supported by the study. In healthcare and hospital settings, this result is in line with the studies conducted by Badri, Attia, & Ustadi, (2009), Mpinganjira (2011), Lee et al. (2010), Naidu Aditi (2009).

The result of the study is directly in line with Yeşilada and Direktör (2010) and Ahmad Azmi and Norzalita (2008) who found that the service quality has a significant effect on patient satisfaction in public and private hospitals.

The hypothesis H_9 i.e. In-Patient Service Quality (IPSQ) has a significant effect on In-Patient Loyalty (IPL) is not supported by the study. The result is not in line with the studies conducted by Wu, Liu, & Hsu, 2008; O'Connor, Trinh, & Shewchuk, 2000; Gooding, 1995, Boshoff and Gray (2004), who found the significant effect of service quality on loyalty.

However, the variables such as disease profile, cost, time are reported as the influencing the patient loyalty. The result of H9 is in line with the studies in healthcare and hospital settings conducted by Wu, C.C. (2011), Lonial S et al., (2010).

The hypothesis H_{10} i.e. In-Patient Service Quality (IPSQ) has a significant indirect effect on In-Patient loyalty (IPL) is supported by the study. The result is in line with the studies by Woodside et al. (1989), Naidu Aditi (2009), Amin, M., & asharuddin, S. Z. (2013), Khasimah Aliman, N., & Normila Mohamad, W. (2013), Wu et al., 2008; Gonzalez, Comesanaa, & Breaa, 2007; Shemwell, Yavas, & Bilgin, 1998; Zeithaml et al., 1996; O'Connor, Shewchuk, & Bowers, 1991 in the context of healthcare and hospitals.

Objective 5: To compare the inpatient service quality, inpatient satisfaction and inpatient loyalty in public and private hospitals.

The analysis is presented in the last section of the fourth chapter. The hypotheses from H_{11} to H_{13} are tested with the t test and the three hypotheses are supported. Hence, the study found that there is a significance difference between public and private hospitals with regard to inpatient service quality, inpatient satisfaction and inpatient loyalty.

5.2 Recommendations

The study recommends that the hospital management/authority of the both public and private hospitals have to focus on the dimension of HospitalQual such as medical service, nursing services, supportive services, administrative services, patient safety, patient communication and hospital infrastructure to provide better services to the inpatients.

The relative importance of the HospitalQual dimension found that the inpatient evaluation of overall service quality is strongly affected by nursing services, followed by administrative, medical, supportive services, patient communication, patient safety and hospital infrastructure. Therefore, it is recommended that, other things being equal, the emphasis on these dimensions make a difference to the inpatient service quality of the hospitals.

The study found that the inpatient service quality has a significant effect on inpatient satisfaction and indirect effect on the inpatient loyalty. Hence it is recommended that the hospital management needs to focus on the inpatient service quality in order to satisfy the patients and make them loyal.

5.3 Observations

Apart from quantitative findings, the following observations are made through a qualitative study during instrument development stage and data collection. It is observed that patients in public hospitals are happy with the medical services, but the availability of doctors is a major concern. The patient has to wait to see the doctors and also the time spend by the doctor with patient is very less. This is because of the more patient inflow in the public hospitals. The public hospitals are unable to provide proper drinking water and maintain the hygiene conditions. The patients of public hospitals are happy with the food provided by the hospitals. Patient safety is another major concern in the public hospitals. The infrastructure needs to be improved further in the public hospitals. The behaviour of the staff in the public hospitals also needs to be changed.

There are delays in the discharge process in the private hospitals due to delay in preparing discharge summary, final billing and clearance from the insurance company. Private hospitals also need to improve the supportive services. Patient safety needs to be given much attention by strengthening the infection control committee in the private hospitals. Patients expressed their unhappiness with the food provided by the hospitals. The security services need to be improved in private hospitals.

5.4 Research Contribution

The study provides the following contributions to the academic theory and healthcare and hospital management.

5.4.1 Academic Theory

Previous studies that have been conducted in the area of service quality did not focus much on inpatient service quality in Indian hospitals. This research synthesized concepts

from two main theories of service quality: Parasuraman's SERVQUAL, Cronin & Taylor's SERVPERF where SERVQUAL refers to Expectancy Disconfirmation Theory and SERVPERF refer to Performance Theory. The present study evaluates individual variables of inpatient perceived service quality of hospitals in a more holistic manner. The study adopted the approach of Performance Theory suggested by Cronin & Taylor (1992) which suggested that only perceptions are better determinants of Service-Quality.

Though there are few studies on service quality in hospitals, hardly there are studies exclusively on inpatient service quality in India. The present study has developed HospitalQual to evaluate the inpatient service quality in the context of Indian hospitals.

After reviewing literature, the study identified the variables for the evaluation of inpatient service quality, patient satisfaction and loyalty. The conceptual model 1 is developed on the basis of relationships between the inpatient service quality factors and overall inpatient service quality and model 2 is developed on the basis of the relationships among the inpatient service quality, inpatient satisfaction and inpatient loyalty. The data collected from three public and three private hospitals located in Hyderabad. A hospital measurement model is developed based on a new set of 25 variables with seven factors. The conceptual model 1 related to the influence of these seven service quality factors on overall Service Quality. The hypotheses from H1 to H7 are tested using multiple regression analysis. This understanding is conceptualized on the basis of prior studies on service quality (Parasuraman, Zeithmal & Berry 1988; Groonors, 1984, Cronin & Taylor, 1992). The results of multiple regression show all the seven inpatient service quality dimensions are found significantly and positively effecting the overall service quality.

Thus, the research contributes to academic theory by developing the HospitalQual model and examines the relationship between inpatient service quality, satisfaction and loyalty using structural equation analysis. The dimensions derived from the study contribute to a greater understanding at the generic level of the role played by these constructs in determining the inpatient service quality in a hospital environment.

5.4.2 Healthcare and Hospital Management

Healthcare services, particularly hospitals are facing enormous issues related to quality today. There are professional bodies like JCI and NABH which are providing the accreditation of healthcare organizations, but there is not much emphasis on functional service quality in Indian hospitals. The major findings of this research have addressed some important managerial contributions for administrators, academic and non-academic staff and leaders of the hospitals.

The study highlights the importance of the seven identified inpatient service quality dimensions in the hospitals. Each of the dimensions along with their respective variables is studied in detail. The study results show the effect of medical service, nursing services, supportive services, administrative services, patient safety, patient communication and hospital infrastructure on overall inpatient service quality provided by the hospitals. These findings confirm and expand the existing knowledge of service quality in general and particularly in healthcare and hospital management.

The conceptualization of inpatient service quality suggests that the overall inpatient service quality will increase by improving these seven dimensions. The results help the management of hospitals to better recognize the factors contributing to inpatient service quality, so that they can provide better service quality which enhances inpatient satisfaction and loyalty.

In the literature, although the importance of service quality to achieve patient satisfaction has been acknowledged, not much has been done to investigate the relationship with patient satisfaction and loyalty in hospitals from the Indian context. The present study revealed and confirmed the existence of the critical relationship between inpatient service quality, inpatient satisfaction and loyalty. The findings suggest that it would be worthwhile for hospital management to take proper measures in order to provide better service to the inpatients.

The changing nature and needs of inpatients regarding better services and increase in competitive intensity necessitates the hospitals to provide satisfied services to inpatients. These can only be achieved through a better understanding of the expectations of inpatients and the importance placed by them on aspects such as medical, nursing, supportive, administrative services, patient safety, patient communication and hospital infrastructure. The results of structural equation modeling (SEM) found that the service quality acts as a key antecedent to inpatient satisfaction and loyalty. Therefore, the hospital management must strive to improve the quality of services in order to satisfy the patient and made them to be loyal.

5.5 Limitations of the Study

The study developed an instrument to measure the inpatient perceived service quality in hospitals with samples taken only from select public and private hospitals located in Hyderabad. Hence a larger sample of different hospitals with representation of all the states would strengthen and support the research findings. The study did not consider the "perceived value" and "cost" factors. The study has also not considered the construct namely, "Technical Service Quality" from the perspective of physicians.

The research analyses are based on the services provided by the hospitals to the inpatients those who came from different parts of Andhra Pradesh. Therefore, the present study has limitations of generalizability of the research findings across hospitals in other parts of the state and the country.

5.6 Scope for Future Research

As the health industry environment is a multi-dimensional and expectations of patients are increasing continuously, there is scope for future avenues of research on service quality in healthcare in general and in hospitals in particular. The future research can focus on the variables that influence the outpatient service quality as it is different from the inpatient services. It can also study the service quality of private, public, not-for profit healthcare organizations, nursing homes and diagnostic centres individually or with different combinations. Future research can take up to evaluate the service quality in

different departments of the hospital like outpatient department, nursing department, diagnostic, pharmacy etc. Future research can be taken up on other hospitals in different states across the country so that the model can be tested thoroughly.

The study can be extended to compare the perceptions of service quality of Indian and International patients. The study can further explore to measure the perceptions of the other stakeholders such as physicians, nurses, administrative staff and patient attendees in hospital. The future studies also can examine the relationship between the service quality, patient satisfaction and loyalty in various hospitals in the country.

5.7 Conclusion

The present study highlights the importance of inpatient service quality and its relationship with patient satisfaction and loyalty in public and private hospitals. The HospitalQual, a scale for measuring the inpatient service quality, has been developed based on three constructs namely inpatient service quality, inpatient satisfaction and inpatient loyalty. And these constructs tested for the validity and reliability of the scale. The results show that Medical Service, Nursing Services, Supportive Services, Administrative Services, Patient Safety, Patient Communication and Hospital Infrastructure have a significant effect on overall inpatients' service quality.

The HospitalQual theoretical model has further developed by using Confirmatory Factor Analysis and Structure Equation Modeling. The final HospitalQual model has emerged with 7 dimensions and 23 variables. The study found that there is a significant effect of inpatient service quality on inpatient satisfaction but not on inpatient loyalty. It also found that inpatient service quality has an indirect effect on inpatient loyalty through inpatient satisfaction. The study also compared the inpatient service quality, inpatient satisfaction and inpatient loyalty between public and private hospitals and found that there is a significant difference between the hospitals.

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Online Resources

http://dme.ap.nic.in/Recognizedhosolist.pdf

http://www.aponline.gov.in/apportal/departments

http://www.hyderabadplanet.com

http://www.ibef.org/industry/healthcare-india.aspx

http://www.jointcommissioninternational.org/

http://www.nabh.co/

http://www.ncbi.nlm.nih.gov/books/NBK2681

www.mapsofindia.com

APPENDIX - I

QUESTIONNAIRE

EVALUATION OF SERVICE QUALITY MANAGEMENT IN INDIAN HOSPITALS: A STUDY OF SELECT HOSPITALS

Mr. Ramaiah Itumalla
Research Scholar

Research Supervisors

Dr. G.V.R.K. Acharyulu
Coordinator, M.B.A Healthcare and Hospital Management
&
Dr. B. Raja Shekhar
Professor

School of Management Studies
University of Hyderabad

YOUR RESPONSES TO THIS STUDY ARE CONFIDENTIAL

The objective of the study is to evaluate the service quality in hospitals. The aim of the study is to improve the service quality in Indian Hospitals based on your expectations. Individual respondents will not be identified by name in any analyses or reports. Responses will be aggregated and reported as summary statistics only. All information will be kept **100% confidential.**

FOR QUESTIONS PERTAINING TO THIS STUDY, CONTACT:
Mr. Ramaiah Itumalla, Research Scholar, School of Management Studies, University of Hyderabad, ramuhealthcare@gmail.com, Mobile: 9985298552

YOUR COOPERATION IS VERY MUCH APPRECIATED

INPATIENT SERVICE QUALITY IN HOSPITAL (HOSPITALQUAL)

SECTION – A

Instructions: In this section you are asked to make judgments about the "service quality provided in the hospital. This section of the questionnaire ***contains 39*** statements relating to the service quality of a Hospital. Please read each statement carefully and indicate the extent to which you agree or disagree, considering an excellent Hospital service quality would be scored as "Strongly Agree (5)" and poor service quality would be scored as "Strongly Disagree (1)" by circling/tick marking the appropriate response.

:

Strongly Disagree	Disagree	Neither Disagree nor Agree	Agree	Strongly Agree
1	2	3	4	5

1. Hospital admission processes was simple	1	2	3	4	5
2. Doctor was prompt in attending to your need	1	2	3	4	5
3. Nurse was prompt in attending to your need	1	2	3	4	5
4. Doctors listen carefully to your problem	1	2	3	4	5
5. Nurse was given your prescribed medication on time	1	2	3	4	5
6. During admission you and /or your family members were given proper counseling to make informed decisions	1	2	3	4	5
7. You are satisfied with the time spent by doctors with you during hospitalization	1	2	3	4	5
8. Nurse was helpful and courteous	1	2	3	4	5
9. Hospital ambience is good	1	2	3	4	5
10. Adequate information was provided by the doctor about treatment procedures and outcomes	1	2	3	4	5
11. Hospital administration explained the estimated cost of hospitalization	1	2	3	4	5
12. Nurse was helpful	1	2	3	4	5
13. The hospital provides required Diagnostics services with less waiting time	1	2	3	4	5
14. Hospital Staff was friendly					
15. Required Medicines are available in the pharmacy	1	2	3	4	5
16. Hospital provided good food	1	2	3	4	5
17. Hospital Staff was helpful	1	2	3	4	5
18. Housekeeping staff maintains cleanliness in the ward/room	1	2	3	4	5
19. Proper facilities provided by the hospital administrators	1	2	3	4	5
20. Hospital administration responded immediately to your problem	1	2	3	4	5
21. Billing procedure was error free	1	2	3	4	5
22. Discharge process was completed without delay	1	2	3	4	5
23. Fast retrieval of documents	1	2	3	4	5
24. Adequacy of hygienic care and procedures (e.g. hand wash, wearing gloves) followed by the hospital staff	1	2	3	4	5
25. The hospital provides proper measures (e.g. bed with side…handrails in aisles, ramps designed for wheelchairs) to reduce the risk of patient harm resulting from falls	1	2	3	4	5
26. Not suffered from hospital infection after 24 hours of admission	1	2	3	4	5
27. Adequate information was provided by the staff	1	2	3	4	5
28. Hospital Staff was caring	1	2	3	4	5
29. Staff communicate in a language that you understand	1	2	3	4	5
30. Hospital staff gave individual attention	1	2	3	4	5
31. Bio-medical Waste (BMW) was treated properly	1	2	3	4	5
32. Hospital staff was responsive	1	2	3	4	5
33. There is a clarity in staff communication	1	2	3	4	5
34. Hospital Staff was professional	1	2	3	4	5

35. The physical facilities of hospital are visually appealing	1	2	3	4	5
36. The hospital have modern and state-of-the-art equipment	1	2	3	4	5
37. The hospital staff are well dressed and appear neat	1	2	3	4	5
38. Hospital has an effective fire safety	1	2	3	4	5
39. Satisfied with medical instructions provided by doctors at the time of your discharge	1	2	3	4	5

40. If your answer is "1 or 2 i.e. Strongly Disagree or Disagree" for any of the above statements, please give the reasons

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SECTION – B

OVERALL SERVICE QUALITY, PATIENT SATISFACTION AND LOYALTY

I am satisfied with the overall service quality provided by the hospital.

41. Satisfied with the Overall In-Patient Service Quality	1	2	3	4	5
42. **PATIENT SATISFACTION**					
Satisfied with the medical service quality	1	2	3	4	5
Satisfied with the nursing service quality	1	2	3	4	5
Satisfied with the supportive service quality	1	2	3	4	5
Satisfied with the administrative service quality	1	2	3	4	5
Satisfied with the patient safety service	1	2	3	4	5
Satisfied with the patient communication	1	2	3	4	5
Satisfied with the hospital infrastructure	1	2	3	4	5

43. **PATIENT LOYALTY**					
I prefer to avail the services from this hospital if I need in future	1	2	3	4	5
I suggest this hospital to my family members if they require the services	1	2	3	4	5
I refer this hospital to my friends/relatives/colleagues	1	2	3	4	5

If your answer is "1 i.e. Strongly Disagree" for any of the above statements, please give the reasons

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SECTION – C

DEMOGRAPHIC FACTORS
(All demographical information will be kept 100% confidential)

Name of the Hospital:…….Address:…….....
Name of the Patient (Optional):……...
Nature of Illness/Cause of Admission:…….....
I.P. Number: **D.O.A:** **D.O.D:**
Room Number: **Room Number:**

Cash	Credit	Arogya Sree

1. Age: ……. 2. Gender: □Male F□male
3. M□rried Un□arried 4. Social Background……..
5. Education…… 6. Occupation:……..
7. Monthly Income (Approximately)…….
8. Region: Telan□na.… Andhra…..□……. Rayalaseema...□…..
9. Distance between the hospital and your residency……
10. Did you find any difficulty in the hospital? □□Y N
11. If yes, please specify ……..
12. Please give some suggestions in order to improve the service quality of hospital:

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THANK YOU FOR YOUR COOPERATION, TIME AND EFFORT

If you have any suggestions please contact:

Mr. Ramaiah I
Research Scholar
School of Management Studies
University of Hyderabad
Mobile: 09985298552; Email: ramuhealthcare@gmail.com

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APPENDIX – II

GOVERNMENT HOSPITALS IN HYDERABAD

S.No	Name of the Hospital	Bed Strength
1	Osmania General Hospital, Hyderabad	1168
2	Gandhi Hospital, Secunderabad	1012
3	Govt. General Hospital & Chest Hospital, Hyderabad	670
4	Govt. Mental Health Hospital, Hyderabad	600
5	Govt. Maternity Hospital, Nayapul, Hyderabad	462
6	S. D. Eye Hospital, Hyderabad	500
7	Niloufer Hospital, Hyderabad	360
8	Institute of Tropical Diseases, Hyderabad	330
9	MNJ Cancer Hospital, Hyderabad	250
10	Govt. Maternity Hospital, Sultan Bazar, Hyderabad.	160
11	Govt. ENT Hospital, Hyderabad	125
12	Govt. Dental College & Hospital, Hyderabad	14

Source: The Directorate of Medical Education, A.P

APPENDIX – III

LIST OF RECOGNIZED PRIVATE HOSPITALS IN HYDERABAD

S.No	**Name of the Hospital**	**Specialization for which recognized**
1	Krishna Institute of Medical Sciences Ltd., 1-8- 31/1, Ministerial Road, Secunderabad	General Medicine, Anaesthesiology, Cardiology, C.T.Surgery, ENT, OBG, Paediatrics, Orthopaedics, Pulmonology, Nephrology, Urology, Neuro Surgery, Plastic Surgery, Radiology, Surgical Gastroenterology and Surgical Oncology
2	Poulomi Hospital, Rukminipuri Colony, Dr. A.S. Rao Nagar, Main Road, Secunderabad	Anaesthesiology, General Medicine, General Surgery, Cardiology, C.T.Surgery, ENT, OBG, Paediatrics, Orthopaedics, Neuro Surgery, Pulmonology, Pathology, Plastic Surgery, Surgical Oncology, Surgical Gastroenterology, Radiology, Nephrology, Urology, and Physiotherapy
3	Vijaya Health Care Centre,8-2-86,Kummariguda, Near Passport office, Secunderabad.	General Medicine, Emergency Medicine, Anaesthesiology, Cardiology, C.T. Surgery, OBG, Paediatrics, Orthopaedics, ENT, Plastic Surgery, Neuro Surgery, Pulmonology, Pathology, Urology, Surgical Gastroesnterology, Surgical Oncology, Radiology and Physiotherapy
4	New Life Hospital, Kamal Theatre Complex. Chaderghat, Hyderabad.	Anaesthesiology, General Medicine, General Surgery, Cardiology, C.T.Surgery, ENT, OBG, Paediatrics, Orthopaedics, Neuro Surgery, Pulmonology, Plastic Surgery, Oncology, Radiology, Nephrology and Urology
5	Care Hospital (A unit of Quality care India Ltd), Banjara Hills, Hyderabad.	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T. Surgery, OBG, Paediatrics, ENT, Orthopaedics, Pathology, Plastic Surgery, Surgical Gastroentesrology, Neuro Surgery, Radiology, Nephrology, Urology and Physiotherapy
6	Geetha Mutli Speciality Hospital, 10-1-5/C, Road No. 4, West Marredpally, Secunderabad.	General Medicine, General Surgery, Cardiology, OBG, Paediatrics, ENT, Orthopaedics and Urology
7	Hyderabad Kidney & Laproscopic Centre, Judges Colony,Malakpet, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, OBG, Orthopaedics, ENT, Neuro Surgery, Pathology, Radiology, Oncology, Nephrology, Urology Surgical Gastroentesrology and Dialysis Unit
8	Premier Hospitals, 12-2-710, Nanal Nagar, Roads, Mehidipatnam, Hyderabad.	General Medicine , Anaesthesiology, Cardiology, C.T.Surgery, ENT, Emergency Medicine, General Surgery, Nephrology, Neuro Surgery, OBG, Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Pulmonology, Radiology, Urology, Surgical Gastroenterology, Surgical Oncology, Urology and Physiotherapy
9	Yashoda Hospital, 64, S.P.Road, Secunderabad	General Medicine, General Surgery, Emergency Medicine, Anaesthesiology, Cardiology, C.T. Surgery, OBG, Paediatrics, Orthopaedics, Joint Replacement Surgery, Nephrology, Urology, ENT, Neuro Surgery, Nuclear Medicine, Surgical Gastroenterology, Surgical Oncology, Radiology and Physiotherapy
10	Global Hospitals, Banjara Hills, Hyderabad	Multi

11	Kamineni Hospitals, L.B.Nagar, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T. Surgery, ENT, OBG, Paediatrics, Orthopaedics, Pathology, Radiology, Nero Surgery, Nephrology, Urology, Plastic Surgery, Neuro Surgery, Physiotherapy and Dialysis Unit
12	Sai Krishna Super Speciality Neuro & Polytrauma Hospital, Kachiguda, Hyderabad	General Medicine, General Surgery, Cardiology, Orthopaedics, ENT, Neuro Surgery, Plastic Surgery, Nephrology, Urology and Physiotherapy
13	Care Hospital (Quality Care Inida Limited) Exhibition Road, Nampally, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T. Surgery, OBG, Paediatrics, ENT, Orthopaedics Pathology, Plastic Surgery, Neuro Surgery, Radiology, Nephrology, Urology and Physiotherapy
14	Image Hospital, 8-3-903/F/12 & 13, Image House, Ameerpet, Hyderabad	General Medicine, General Surgery, Cardiology, C.T. Surgery, OBG, Paediatrics, ENT, Orthopaedics, Pulmonology, Radiology, Nuclear Medicine, Neuro Surgery, Surgical Gastroenterology, Oncology Nephrology, Urology and Dialysis Unit
15	Ram Hospital, 57/A, Shapur Nagar, IDA Jeedimetla, Hyderabad-500055	General Medicine, General Surgery, Emergency Medicine, OBG, Orthopaedics, Neuro Surgery and Nephrology
16	Sigma Hospital, (A Unit of D.B.R Hospital Pvt. Ltd., 35, S.D. Road, Secunderabad	General Medicine, General Surgery, Cardiology, C.T. Surgery, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Plastic Surgery, Oncology, Nephrology and Urology
17	Global Hospitals, 6-1-1070/1 to 4, Lakadi-Ka- Pool, Hyderabad	General Medicine, Cardiology, C.T.Surgery, Orthopaedics, Neuro Surgery, Surgical Gastroenterology, Nephrology and Urology
18	Woodlands Hospital, 30-4-852, Barkatpura, Hyderabad	General Medicine , Anaesthesiology, Cardiology, C.T.Surgery, Emergency Medicine, General Surgery, Nephrology, Neuro Surgery, OBG, Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Pulmonology, Radiology, Urology and Surgical Gastroenterology
19	Yashoda Super Speciallity Hospital, 6-3- 906/B, and B1, Rajbhavan Road, Somajiguda, Hyderabad	General Medicine, General Surgery, Emergency Medicine, Anaesthesiology, Cardiology, C.T. Surgery, OBG, Paediatrics, Orthopaedics, Joint Replacement Surgery, Nephrology, Urology, ENT, Neuro Surgery, Nuclear Medicine, Plastic Surgery, Pulmonology, Pathology, Surgical Gastroenterology, Oncology, Radiology, Physiotherapy and Dialysis Unit
20	Care Hospital, A.S. Raja Complex, Waltair Main Road, Ram Nagar, Visakhapatnam	General Medicine, Anaesthesiology, General Surgery, Emergency Medicine, Cardiology, C.T. Surgery, OBG, ENT, Orthopaedics, Pulmonology, Pathology, Plastic Surgery, Neuro Surgery, Radiology, Nephrology, Urology, Physiotherapy and Dialysis Unit
21	Medwin Hospitals, Raghava Ratna Towers, Chirag Ali Lane, Nampally, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T. Surgery, Emergency Medicine, OBG, Paediatrics, Orthopaedics, ENT, Plastic Surgery, Neuro Surgery, Pulmonology, Radiology, Pathology, Oncology, Surgical Gastroenterology, Urology, Nephrology, Physiotherapy and Dialysis
22	Hrushikeshya Hospital, 2-6-71/a,	General Medicine, Anaesthesiology, Cardiology, C.T.Surgery, General Surgery, Nephrology, Neuro Surgery,

	Bharathnagar Colony, Near Masjid, Uppal, Hyderabad	OBG, Orthopaedics, Paediatrics, Plastic Surgery, Urology, Physiotherapy and Dialysis Unit
23	Yashoda Super Speciality Hospital (A Unit of Yashoda Health Care Services Pvt., Ltd.) 16- 10-29, Nalgonda 'X' Road, Malakpet, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T. Surgery, OBG, Paediatrics, Orthopaedics, Joint Replacement Surgery, Nephrology, Urology, ENT, Neuro Surgery, Pathology, Plastic Surgery, Pulmonology, Radiology Surgical Gastroenterology, Oncology, Physiotherapy and Dialysis
24	Life Hospitals 2-2-12/3/C, Durgabai Deshmukh Centre, Shivam Road, D.D. Colony, Hyderabad - 500 007	General Medicine , Anaesthesiology, Cardiology, C.T.Surgery, ENT, Emergency Medicine, , General Surgery, Nephrology, Neuro Surgery, OBG, Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Pulmonology, Radiology, Urology, Physiotherapy and Dialysis Unit
25	Remedy Hospitals, Road No.4, KPHB Colony, Kukatpally, Hyderabad	General Medicine, General Surgery, OBG, ENT, Orthopaedics, Neuro Surgery, Plastic Surgery, Oncology, Surgical Gastroesntesrology, Nephrology, Urology and Dialysis
26	Alpha Hospital, 23-1-863, Near MCH Swimmingpool, Moghalpura, Hyderabad	General Medicine, General Surgery, Emergency Medicine, Cardiology, OBG, Paediatrics, Nephrology, Urology, Orthopaedics, Pulmonology, Plastic Surgery and Physiotherapy
27	Apollo Hospital, Jubilee Hills, Hyderabad	General Medicine, Anaesthesiology, General Surgery, Emergency Medicine, Cardiology, C.T. Surgery, Paediatrics, ENT, Orthopaedics, Pulmonology, Pathology, Plastic Surgery, Neuro Surgery, Radiology, Nuclear Medicine, Nephrology, Urology, Surgical Gastroenterology, Surgical Oncology, Physiotherapy and Dialysis Unit
28	Shravana Hospitals, 5-3-847, Mozamjahi Market, Hyderabad	General Medicine, Anaesthesiology, Cardiology, C.T.Surgery, ENT, Emergency Medicine, General Surgery, Nephrology, Neuro Surgery, OBG, Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Pulmonology, Radiology, Surgical Gastroentesrology, Urology and Physiotherapy
29	Kamineni Hospitals, 4-1-1227, King Koti Road, Abids, Hyderabad – 500001.	General Medicine, General Surgery, Emergency Medicine, Cardiology, C.T.Surgery, OBG, Paediatrics, Orthopaedics, ENT, Anaesthesiology, Nuero Surgery, Surgical Oncology, Surgical Gastroenterology, Urology, Nephrology and Dialysis.
30	Mediciti Hospital, 5-9-22, Secretariat Road, Sarovar Complex, Hyderabad - 500063.	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T. Surgery, ENT, OBG, Orthopaedics, Neuro Surgery, Plastic Surgery, Pulmonology, Pathology, Radiology, Oncology, Nephrology, Urology, Physiotherapy and Dialysis Unit
31	Challa Hospital, 7-1-71/A/1, Dharam Karan Road, Ameerpet, Hyderabad.	General Medicine, General Surgery, Cardiology, OBG, ENT, Orthopaedics, Paediatrics, Pulmonology, Neuro Surgery, Urology, Plastic Surgery, Nephrology, Surgical Gastroenterology, Surgical Oncology and Dialysis Unit
32	Apollo DRDO Hospital, DRML 'X' Road, Kanchanbagh, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Emergency Medicine, Cardiology, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Plastic Surgery, Pathology, Pulmonology, Radiology, Nephrology, Urology, Physiotherapy and Dialysis Unit
33	Apollo Hospital, Vikrampuri,	General Medicine, Anaesthesiology, Cardiology, ENT,

	Secunderabad	Emergency Medicine, General Surgery, Nephrology, Nuclear Medicine, Obst & Gynaecology, Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Pulmonology, Gastroentrology Radiology, Oncology and Physiotherapy
34	Sai Bhavani Hospital, Main Road, Shapur Nagar, Jeedimetla, Hyderabad	Gen. Medicine, Gen. Surgery, ENT, OBG, Paediatrics, Cardiology, Cardiothorasic Surgery, Surgical Oncology, Nephrology, Gastroentrology, Anaesthesiology, Urology, Radiology, Neurology, Neuro Surgery, Orthopaedics, Pulmanology, Plastic Surgery.
35	Balaji Hospital, Plot No. 34,34/A, N.C.L. South, Pet Basheerabad, Medchal Road, Secunderabad.	General Medicine, General Surgery, Anaesthesiology, Orthopaedics & Traumotology, OBG, Paediatrics, ENT, Pulmonology, Urology, Nephrology, Neuro Surgery, Radiology, Pathology, Surgical Gastroenterology and Physiotherapy
36	Seha Hospital, Lakdikapool, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, OBG, Paediatrics, ENT, Orthopaedics, Pulmonology, Pathology, Urology, Neuro Surgery, Surgical Gastroenterology, Radiology, and Physiotherapy
37	Goodwill Kidney & Surgical Hospital, Banjara Hills, 10-5-131/2/B Road no. 1, Hyderabad	General Medicine, General Surgery, Urology, Nephrology, Neuro Surgery, Plastic Surgery, Paediatrics, OBG, Orthopaedics, Radiology, Anaesthesiology, ENT, Surgical Gastroenterology, Pulmonology and Physiotherapy
38	Mythri Hospital, Plot No. 5-4/12 to 16, Main Road, Chandanagar, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T. Surgery, ENT., Nephrology, Neuro Surgery, Nuclear Surgery, OBG., Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Pulmonology, Radiology, Surgical Gastroenterology, Surgical Oncology, Urology, Physiotherapy and Dialysis Unit
39	Kamala Hospital, Kamala Complex, Chandna Brother's Center, Dilsuknagar, Hyderabad	General Medicine, Anaesthesiology, Cardiology, Emergency Medicine, General Surgery, ENT, Nephrology, Neuro Surgery, OBG, Paediatrics, Orthopaedics, Pathology, Plastic Surgery, Pulmonology, Radiology, Surgical Oncology, Urology and Dialysis Unit
40	Susheela Hospitals, 8-3-667/1, Engineers Colony, Yousufguda Road, Near K.K. Towers, Hyderabad	General Medicine, Anaesthesiology, Pathology, Radiology, Orthopaedics, , OBG., Paediatrics, Urology, Pulmanology, E.N.T., Neuro Surgery, Plasic Surgery, Cardiology, Nephrology, Physio Therapy and also General Surgery
41	Star Hospitals (A Unit of UNIMED HEALTH CARE PVT. LTD.), .8-2-596/5, Road No. 10, Banjara Hills, Hyderabad.	General Medicine, Anaesthesiology, Cardiology, C.T.Surgery, Emergency Medicine, General Surgery, ENT, Nephrology, Neuro Surgery, Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Pulmonology, Radiology, Urology, Physiatherapy and Dialysis Unit
42	Kamineni Hospitals, Basheer Bagh, Hyderabad.	Anaesthesiology, General Medicine, General Surgery, Emergency Medicine, E.N.T, Orthopaedics, Paediatrics, Pulmonology, Neuro Surgery, Urology, Plastic Surgery, Nephrology, Pathology, Radiology, Physiotherapy and Dialysis Unit
43	Raghavendra Hospital, Opp. Round Building ECIL Cross Roads, Hyderabad.	General Medicine, General Surgery, Anaesthesiology, Cardiology, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Surgical Gastroenterology, Pulmonology, Nephrology and Physiotherapy
44	Prime Hospitals, Road. No. 1 K.P.H.B Colony Kukatpally,	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, OBG, ENT, Orthopaedics

	Hyderabad.	& Joint Replacement, Neuro Surgery, Plastic Surgery, Radiology, Surgical Oncology, Nephrology and Dialysis Unit
45	Aware Global Hospitals, 8-16-01, Sowbhagya Nagar, Sagar Road, Lingoliguda, Saroornagar, Hyderabad.	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T. Surgery, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Pulmonology, Plastic Surgery, Pathology, Radiology, Oncology, Nephrology, Urology, Physiotherapy and Dialysis Unit
46	Gurunanak Care Hospital, 1-4-908/7/1, Musheerabad Main Road, Musheerabad, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T. Surgery, OBG, Orthopaedics, ENT, Plastic Surgery, Neuro Surgery, Pulmonology, Surgical Oncology, Surgical Gastroenterology, Urology and Nephrology
47	Axon Hospitals, 8-3-215. Srinivasanagar Colony West, Opp. ICICI Bank, S.R.Nagar, Hyderabad	General Medicine, Anaesthesiology, Cardiology, C.T.Surgery, General Surgery, Neuro Surgery, OBG, Orthopaedics, Urology, Physiotherapy and Dialysis Unit
48	Mythri Hospital, 13-6-434/C/148, Near PVNR Airport Flyover Pillar No.80, Mehidipatnam, Hyderabad	General Medicine, General Surgery, Emergency Medicine, Cardiology, C.T. Surgery, OBG, Paediatrics, Orthopaedics, ENT, Plastic Surgery, Neuro Surgery, Pulmonology, Surgical Gastroenterology, Surgical Oncology, Nephrology, Urology and Physiotheray
49	Sai Srinivasa Speciality Pvt., Ltd., Narayanaguda, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, ENT, Nephrology, Neuro Surgery, OBG, Orthopaedics, Paediatrics, Pathology, Plastic Surgery, Radiology, Surgical Gastroesnterology, Surgical Oncology, Pulmonology, Urology, Physiothesrapy and Dialysis
50	Image Hospitals, 1-90/2/G/2, Arunodaya Cooperative Housing Society, Madhapur, Hyderabad	General Medicine, Cardiology, C.T.Surgery, Neuro Surgery, Orthopaedics, Pulmonology, Radiology, Medical Oncology, OBG, Paediatrics, Urology, ENT and Emergency Medicine
51	Times Hospital, 6-2-413/B, Road No. 4, Banjara Hills, Hyderabad	General Medicine, General Surgery, OBG and Urology
52	The Deccan Hospitals, 6-3-903/A and B, Somajiguda, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Cardiology, OBG, Paediatrics, ENT, Plastic Surgery, Neuro Surgery, Pulmonology, Nephrology Urology, Orthopaedics and Trauma
53	Anupama Hospital, 16-31/494 & 495, 6th Phase, KPHB Colony, JNTU Road, Kukatpally, Hyderabad	General Medicine, General Surgery, Cardiology, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Plastic Surgery, Oncology, Pulmonology, Nephrology and Urology
54	Sunshine Hospitals, 1-7-201 to 205, Prenderghast Road, Secunderabad	Cardiology, C.T.Surgery, Emergency Medicine, General Medicine, General Surgery, OBG, Orthopaedics, Neuro Surgery, Paediatrics, Plastic Surgery, Pulmonology, Radiology, Surgical Oncology and Surgical Gastroentesrology
55	Narayana Hrudayalaya, 1-1-216, Suraram 'X' Roads, Jeedimetla, Hyderabad	General Medicine, General Surgery, Cardiology, C.T.Surgery, Neuro Surgery, Nephrology, Urology, Surgical Gastroentesrology, Plastic Surgery, Paediatrics, Pulmonology, OBG, ENT and Orthopaedics & Trauma Care
56	Prasad Hospital, MIG-204, Road No.1, Opp. Sitara Hotel, KPHB Colony, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, ENT, Emergency Medicine, OBG, Paediatrics, Orthopaedics, Pathology, Plastic Surgery, Nephrology, Neuro Surgery, Pulmonology, Radiology, Urology,

		Physiotherapy and Dialysis Unit
57	Omni Hospitals, Opp. P.V.T. Market Kothapet 'X' Road, Dilsukhnagar Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T.Surgery, ENT, Nephrology, Neuro Surgery, OBG, Orthopaedics, Nephrology, Paediatrics, Pathology, Plastic Surgesry, Pulmonology, Radiology, Surgical Oncology, Urology, Physiotherapy and Dialysis Unit
58	Apollo Hospitals, 9-1-87, 9-1-87/1, St.John's Road, Beside Keyes High School, Secunderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T.Surgery, ENT, Emergency Medicine, Nephrology, Neuro Surgery, Orthopaedics, Pathology, Plastic Surgery, Pulmonology, Radiology, Surgical Gastroenterology, Surgical Oncology, Urology, Physiotherapy and Dialysis Unit
59	Olive Hospitals Pvt. Ltd., 12-2-718/3-5, Nanal Nagar 'X' Road, Mehidipatnam, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Cardiology, ENT, Paediatrics, Orthoplaedics, OBG, Pulmonology, Nephrology, Neuro Surgery, Urology, Radiology, Surgical Gastroenterology, Surgical Oncology, Physiotherapy and Dialysis Unit
60	Apollo Hospital , PR No. 3-5-836 to 838, Near Old MLA Quarters, Hyderguda, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Emergency Medicine, Cardiology, C.T. Surgery, ENT, Nephrology, Neuro Surgery, Orthopaedics, Pathology, Plastic Surgery, Pulmonology, Radiology, Urology, Physiotherapy and Dialysis Unit
61	Swapna Hospital, # 1-7-97, Chaitanyapuri, Dilsukhnagar, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, Pediatrics, Pathology, OBG, Orthopaedics, ENT, Urology and Radiology
62	BBR Hospital, Ferozguda, Balanagar, Secunderabad	General Medicine, General Surgery, Cardiology, OBG, Paediatrics, Orthopaedics, ENT, Pulmonology, Urology, Nephrology, Neuro Surgery, Radiology, Pathology, Plastic Surgery, Surgical Oncology, Surgical Gastroenterology and Physiotherapy
63	Venus Hospital, D.No. 16-2-661/EFGH, Judges Colony, Malakpet, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T. Surgery, OBG, ENT, Paediatrics, Orthopaedics, Neuro Surgery, Pathology, Pulmonology, Plastic Surgery, Radiology, Urology, Nephrology and Physiotherapy
64	IKON Hospital, 16-11-741/C/1/15, Behind TMC, Adjacent to Reliance Fresh, Dilsukhnagar, Hyderabad	General Medicine, General Surgery, Anaesthesiology, OBG, Paediatrics, Orthopaedics, Cardiology, Urology and Plastic Surgery
65	Sreshta Orange Hospital, Opp. to Vijayalaxmi Theatre, L.B.Nagar 'X' Roads, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Emergency Medicine, OBG, Paediatrics, ENT, Othopaedics, Nephrology, Neuro Surgery, Pathology, Plastic Surgery, Pulmonology, Radiology, Urology, Physiotherapy and Dialysis Unit
66	Indus Hospitals, Opp. Kothapet Fruit Market, Kothapet, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Emergency Medicine, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Pathology, Plastic Surgery, Pulmonology, Radiology, Nephrology, Urology, Physiotherapy and Dialysis
67	Sai Sanjeevini Hospitals, Plot No. 7, Narasimhapuri Colony, Kothapet, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T. Surgery, OBG, Paediatrics, Pathology, Orthopaedics, ENT, Neuro Surgery, Pulmonology, Plastic Surgery, Radiology, Nephrology, Urology and Physiotherapy
68	Viswas Hospitals, 8-2-77/1,	General Medicine, General Surgery, Emergency Medicine,

	Near Manda Mallamma Function Hall, Karmanghat Hanuman Temple Road, Champapet, Hyderabad	Cardiology, OBG, Paediatrics, ENT, Orthopaedics, Radiology and Physiotherapy
69	Bristlecone Hospital, Plot No. 3-4-136/A, Barkatpura, Hyderabad	General Medicine, General Surgery, Orthopaedics and Nephrology
70	Lazarus Hospitals, 6-2-971, Lakdikapool, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Cardiology, C.T.Surgery, ENT, OBG, Paediatrics, Orthopaedics, Neuro Surgery, Pulmonology, Plastic Surgery, Nephrology, Urology, Surgical Gastroenterology, Radiology and Oncology
71	Sunrise Hospitals, 4-9-321, Plot No. 4 & 7, Hayathnagar, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T.Surgery, ENT, OBG, Paediatrics, Orthopaedics, Neuro Surgery, Pathology, Nephrology, Radiology, Physiotherapy and Dialysis
72	Tulasi Hospitals, A-12, Electronic Complex, Beside SBH, Kushaiguda, ECIL 'X' Road, Hyderabad	General Medicine, General Surgery, Anaesthesiology, Emergency Medicine, Cardiology, C.T.Surgery, ENT, Gynaecology, Paediatrics, Orthopaedics & Trauma Care, Neuro Surgery, Pulmonology, Nephrology, Urology, Surgical Gastroenterology, Radiology, Surgical Oncology, Physiotherapy and Dialysis
73	Healthcare Hospitals, 3-2-394, Near L.B.Nagar Circle, Towards Sagar Ring Road, L.B.Nagar, Hyderabad	Anaesthesiology, General Medicine, General Surgery, OBG, Pediatrics, ENT, Orthopaedics, Neuro Surgery, Pathology, Plastic Surgery, Radiology, Pulmonology, Nephrology, Urology, Physiotherapy and Dialysis
74	Xenia Hospitals, Plot No.43, (E.C. Extension), ECIL 'X' Roads, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Emergency Medicine, Cardiology, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Pulmonology, Plastic Surgery, Pathology, Radiology, Nephrology, Urology, Physiotherapy and Dialysis
75	Vivekananda Hospital, 6-3-871/A, Green Lands Road, Begumpet, Hyderabad	General Medicine, Anaesthesiology, General Surgery, Cardiology, OBG, Paediatrics, Orthopaedics & Joint Replacement, ENT, Plastic Surgery, Pulmonology, Oncology, Nephrology, Urology, Pathology, Radiology, Surgical Gastroenterology and Physiotherapy
76	Sri Sai Ram Hospital, 9-1-364/2/A, Opp. Bapu Ghat, Langer House, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Emergency Medicine, Cardiology, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Plastic Surgery, Pathology, Radiology, Nephrology and Urology
77	Nikhil Hospitals, 8-3-982, Plot No. 145 Near Satya Sai Nigamagamana, Sri Nagar Colony, Ameerpet, Hyderabad	General Medicine, Anaesthesiology General Surgery, Cardiology, C. T. Surgery, OBG, Paediatrics, ENT, Orthopaedics, Neuro Surgery, Plastic Surgery, Radiology, Oncology, Nephrology, Urology, and Physiotherapy
78	Surekha Hospital, Near Dulapally 'X' Roads, Beside Runway 9, Kompally, Hyderabad	Anaesthesiology, General Medicine, General Surgery, OBG, Paediatrics, Orthopaedics, Pilmonology, Radiology and Physiotherapy
79	Indo-US Super Speciallity Hospital, 7-1-57/B & C, Shyam Karan Road, Anand Bagh, Ameerpet, Hyderabad	General Medicine, General Surgery, Emergency Medicine, Cardiology, C.T. Surgery, ENT, Orthopaedics, Neuro Surgery, Pulmonology, Plastic Surgery, Surgical Gastroenterology, Surgical Oncology, Nephrology and Urology
80	ICON Hospital, 540/1 & 2,	General Medicine, General Surgery, OBG, Paediatrics, ENT,

	JNTU-Hitech City Road, VI Phase, KPHB Colony, Hyderabad	Orthopaedics, Neuro Surgery, Pulmonology, Plastic Surgery, Oncology, Nephrology and Urology
81	Matrix Hospital, Plot No. 4, 5, 14 and 15 Pragathi Nagar, Hyderabad	General Medicine, General Surgery, Anaesthesiology, OBG, Paediatrics, Orthopaedics, ENT, Neuro Surgery, Plastic Surgery, Surgical Gastroenterology, Oncology, Pulmonology, Nephrology and Urology
82	Manju Sudha Hospital, H.No. 4-20/A, Vikas Nagar Lane, Dilsukhnagar, Hyderabad	Anaesthesiology, General Medicine, General Surgery, OBG, Paediatrics, Orthopaedics, ENT, Neuro Surgery, Plastic Surgery, Pulmonology, Surgical Gastroenterology and Urology
83	Oxygen Hospitals, Opp. Rythu Bazar, Alwal, Hyderabad	General Medicine, General Surgery and Nephrology
84	Focus Hospital, 17-1-382/B/3 7 4, Bhanunagar, Chempapet, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Cardiology, ENT, OBG, Orthopaedics, Neuro Surgery, Pathology, Plastic Surgery, Radiology, Nephrology and Urology
85	Continental Hospitals, Plot No. 3, Road No. 2, IT & Financial District, Nanakramguda, Gachibowli, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Cardiology, C.T. Surgery, OBG, Paediatrics, Orthopaedics, ENT, Neuro Surgery, Plastic Surgery, Neclear Medicine, Pulmonology, Pathology, Oncology, Nephrology, Urology, Physiotherapy and Dialysis
86	Raksha Multi Speciality Hospital, Plot No. 5, Jahangir Nagar Check Post, L.B.Nagar, Hyderabad	General Medicine, General Surgery, OBG, Paediatrics and Orthopaedics
87	Kakatiya Hospitals, 12-52, Road No. 2, P & T Colony, Near Uppal Bus Depot, Medipally, Hyderabad	General Medicine, General Surgery,OBG, Orthopaedics, Plastic Surgery and Neuro Surgery
88	Ravi Hospital, LIG- 564 & 565, Road No. 3, Behind .S.Brothers, KPHB Colony, Hyderabad	General Medicine, General Surgery, OBG, Paediatrics, Orthopaedics, ENT, Plastic Surgery and Urology
89	Pranaam Hospital, 1-58/6/40841, Madinaguda, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Paediatrics, Orthopaedics, ENT, Plastic Surgery, Radiology, Pathology and Physiotherapy
90	Ozone Hospital, Beside CMR Shopping Mall, Kothapet, Hyderabad	Anaesthesiology, General Medicine, General Surgery, Cardiology, C. T. Surgery, OBG, Paediatrics, Orthopaedics, Neuro Surgery, Pathology, Pulmonology, Plastic Surgery, Radiology, Oncology, Nephrology and Urology

Source: Directorate of Medical Education, AP.
(dme.ap.nic.in/Recognizedhosolist.pdf)

APPENDIX – IV

SNAP SHOTS OF DATA COLLECTION











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APPENDIX – V

A. LIST OF PUBLICATIONS (4 International + 4 National)

1. Ramaiah Itumalla (2010). Service Quality in Healthcare: A Theoretical Understanding. *Indian Journal of Healthcare Quality & Management (The Official Journal Indian Healthcare Quality Forum),* 1 (1): 32-38.
2. Ramaiah Itumalla, GVRK Acharyulu. (2011). Patients' Perceptions of Outpatient Service Quality - A Case Study of a Private Hospital in South India. *International Journal of Research in Commerce and Management*, 2 (6):80-83.
3. Ramaiah Itumalla (2011). Leadership and Service Quality in Healthcare Organizations, *International Journal of Management Research and Review*, 1(3):79-84..
4. Ramaiah Itumalla (2012). A Study on Healthcare Quality, *International Journal of Management Research and Review*. 2(2):308-315.
5. G.V.R.K.Acharyulu & Ramaiah Itumalla (2012). Branding and Service Quality in Healthcare Sector with special reference to Hospitals, in Sapna Singh and V.Venkata Ramana (Ed) *Branding – A Strategic Tool for Corporate Success*, Paramount Publishing House, New Delhi, Hyderabad. 151-162.
6. Ramaiah Itumalla (2012). Information Technology and Service Quality in Health Care: An Empirical Study of Private Hospital in India, *International Journal of Innovation, Management and Technology (IJIMT),* 3 (4): 433-436.
7. G.V.R.K Acharyulu, Ramaiah Itumalla (2012). A Study on Quality as a Emerging Challenge in Healthcare Sector, in S. Teki, N. Udaya Bhaskar, P. Uma Maheswari Devi (Ed) *Emerging Challenges and Strategies for Service Sector*, Excel India Publishers, New Delhi,109-115.
8. Ramaiah Itumalla, Dr. G.V.R.K. Acharyulu (2013). Dimensions of Measuring Inpatient Service Quality in Hospital: A Conceptual Model" in, M Kasi Reddy & V Harileela (Ed), *Innovations in Service Quality Management*, Lorven publication, Hyderabad, 156-170.

B. PAPERS PRESENTATIONS (2 International + National 8)

1. "Information Technology and Service Quality in Health Care: An Empirical Study of Private Hospital in India", 2nd Journal Conference on Innovation, Management and Technology (JCIMT 2012 2nd), Organised by International Economics Development and Research Center (IEDRC), July 23-24, 2012, **Singapore.**
2. "HospitalQual: A Measurement Scale for Inpatient Service Quality in Indian Hospitals", International Conference on "Trends in Multidisciplinary Business and Economic Research" (TMBER, 2014), Organized by Global Illuminators, March 27-28, 2014, **Bangkok, Thailand.**
3. "Patients' Perceptions Of Outpatient Quality of Care In A Private Hospital In Kanyakumari District at One day Seminar on Managing Hospitals: The Road ahead Department of Hospital Management, Organized by Department of Hospital Management, Deccan School of Management (Best Paper Presentation Award).
4. "Leadership and Service Quality in Healthcare Management" National conference on Leadership and Corporate Governance in Turbulence Times, UGC - SAP organized by School of Management Studies, University of Hyderabad, 17-18 March, 2011, Hyderabad, A.P.
5. "Quality of Hospital Services and Medical Tourism" National Conference on Hospitality and Tourism: Responsible Tourism Organised by Dr. Y.S. Rajashekhara Reddy National Institute of Tourism and Hospitality Management, 11th – 12th November, 2001, Hyderabad, A.P.
6. "Quality and Accreditation: A revolutionary change in Hospitals" II National Conference on Healthcare Challenges, Issues and Strategies, Organized by Department of Hospital Management, Hemachandracharya North Gujarat University, 27th November, 2011, Patan, Gujarat.
7. "Quality: An Emerging Challenge in Healthcare Sector" National Conference on "Challenges and Strategies for Service sector", 8-10, December, 2011,

Department of Management Studies, Aadikavi Nannaya University, Rajahmandry.A.P

8. "Inpatients' Service Quality in Hospital: A Theoretical Understanding", National Conference on Innovations in Service Quality Management, Organised by Chatanya Bharathi Institute Technology, 31st Jan- 1st Feb, 2013, Hyderabad. A.P.
9. "Development of HospitalQual Measurement Model: A service quality scale for measuring in-patient services in hospital" National Seminar on Multivariate Analysis for Management Research, Organized by Department of Business Management, Osmania University, 14-15, September, 2013.Hyderabbad, A.P.
10. "Development of HospitalQual: A Service Quality Scale for Measuring Inpatient Services in Hospital" 7th ISDSI & 5th OSCM International Conference, 28-29 December, 2013, Organizing by International Management Institute, New Delhi.