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EXPLORATORY ANALYSIS OF HAPPINESS OF PATIENTS IN TWO-KOLKATA BASED HEALTHCARE INSTITUTIONS

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ABSTRACT
Service quality is a primary concern for enhancing quality medical care for patients. Healthcare providers place a major emphasis on quality of care to fulfill and retain their patients. The objectives of the paper is to identify the essential and significant determinants of service quality in a public healthcare provider that results in patients' happiness and establish a relationship between service quality determinants and patients happiness. An empirical investigation was carried out in two private hospitals in Kolkata, India. A field survey was conducted between October 2023 to December 2023 on 480 patients. A self-administered questionnaire with a stratified sampling technique was employed to gather the information. The gathered data were examined using statistical approaches such as reliability analysis, factor analysis and multiple regression in SPSS software. The result reveals that patient happiness in private healthcare providers is determined by service quality factors that includes hygiene, infrastructure, environment, cost, attitude, satisfaction, nutrition, expertise and safety. It also establishes a serious correlation between service quality determinants and patients happiness in private healthcare providers. Infrastructure is the most significant predictor of patients' happiness. The study findings will help administrators of healthcare facilities create worthwhile and efficient plans to provide their patients with top-notch medical care.
Keywords: Service quality determinants, patients' happiness, public healthcare provider, exploratory factor analysis.

I. Introduction
India takes pride in having a diverse population from a variety of cultures. Healthcare service provider is the largest and fast developing sector in India. It is a leading contributors to Indian economy in terms of employment and revenue [1]. Indians are now more conscious of their health owing to increased access to information concerning health, hike in medical tourism and expansion of health insurance. Since economic progress and health are inextricably linked, none can be accomplished without the other. The Constitution of the World Health Organization (2011) defines health as a condition of total mental, physical and social wellbeing, not just the absence of disease or disability. It is undeniable that quality is imperative for all service provider including healthcare. Quality eventually determines the worth of the service provider. The Institute of Medicine (2001) defines quality of care as 'The extent to which health services are in line with current professional knowledge and improve the likelihood of desired health outcomes for both individuals and populations'. Health services are crucial in deciding quality of life. Service quality of healthcare provider effectively focuses on managing and monitoring both technical and functional quality for a long run success [2]. Issues about the availability, price and accessibility of excellent health services exist in emerging nations like India [3]. The services rendered by the healthcare providers are met with high expectations from customers. Healthcare providers must meet customer expectations in order to ensure consistent demand and existence in the market [4]. Patient satisfaction is a key element to caliber the services of healthcare providers [5]. Individuals take their health seriously and will go to any extent to receive the greatest medical treatment accoutered by healthcare providers. If an individual is satisfied she/he will choose the same alternative again otherwise she/he will single out other alternative for satisfied result. Thus user perspective arbitrates "survival of the fittest." Accreditation by national and international healthcare accreditation groups are highly valued by healthcare providers. Primary, Secondary and Tertiary care are the types of healthcare providers in India.

The Indian Constitution promulgate health to be a matter of state policy. Therefore the state governments have tremendous responsibilities to take care of health of the population in the state. In such a challenging situation, substantial demand of quality healthcare providers is discernible. As per the Indian health statistics report (2012), the state of West Bengal has seen remarkable growth in the quality of healthcare providers during the last two decades. Healthcare providers located in the capital city of West Bengal i.e. Kolkata are serving massive population. Patients from various district of West Bengal and countries like Nepal, Bhutan, and Bangladesh comes to Kolkata for medical treatment. According to the National Sample Survey Organization (2006), 82% of the population pursue treatment in public hospitals. The number of hospitals in the state is insufficient to serve the large population of West Bengal. Therefore it is obvious that there must be a heavy demand for quality healthcare providers in the state. Private hospitals will offer treatment to affordable customer, while public hospitals will continue to serve the general public. An evaluation of service quality allows management to identify key areas for improvement and delivering satisfactory customer service.

II. Literature

The evaluation of service quality is an intricate task. The ultimate goal of measuring service quality is to help healthcare providers ensure their service quality and gain client happiness. As a result excellent levels of care and quality management of service delivery are obligatory for healthcare providers. There is substantial correlation between healthcare rendition and patients experience [6]. In diverse healthcare settings the relative importance of each parameter for calibrating overall service quality may deviate. Globally, a large number of research studies have been carried out on the quality of services of healthcare providers which includes Guinea, Bangladesh, Burkina Faso, South Korea, Egypt, Turkey, Taiwan, USA, Australia, Cyprus, Japan, Mauritius, Afghanistan, Greece, Portugal, Ghana, Kazakhstan, Bahrain, Iran, Pakistan, Serbia, Malaysia, Romania, Thailand and Albania [7-37]. There is a wealth of data supporting the use of multiple conceptual models in evaluating the standard of medical care. Table-1 shows several service quality models developed by various researchers.

Year	Model	Author
1966	Donabedian	Donabedian
1988	SERVQUAL	Parasuraman et.al
1992	SERVPERF	Cronin et.al
1998	HEALTHQUAL	Camilleri et.al
2001	KQCAH	Sower et.al
2008	PRIVHEALTHQUAL	Fowder
2010	PUBHOSQUAL	Aagja et.al
2014	HospitalQual	Itumalla et.al
2014	HospiSE	Voon et.al

Table-1: Different models of service quality

An instrument to access service quality known as SERVQUAL was developed [39]. The dimensions are accessibility, respect, understanding, competence, security, responsiveness, tangibility, and credibility. Later in 1988 [40], these dimensions were proselyted into five dimensions, namely, reliability, assurance, responsiveness, empathy and tangibles. The five dimension of SERVQUAL are widely used by several service providers including healthcare [14, 22, 28-31, 41-51]. Several research studies have demonstrated a direct linkage between patient satisfaction and service quality [19, 52-55]. Another quality assessment model known as SERVPERF was developed [56], which emphasises quantifying client opinions of service quality. A model based on three dimensions namely service environment, service delivery approach and service product was developed [57]. Many researchers quibbled that SERVQUAL model have some serious intricacy. Depending on the convenience of the study, some researchers introduced affordability [58], physical appearance [59],

cost [29, 60], administrative alertness and assistance abilities [61], interaction and bribe [62], courtesy [63], caring and consequence [64], affordability and availability [65] to SERVQUAL. A multilevel model was postulated in Jakarta to pinpoint three primary dimensions namely atmosphere, consequences and communication of healthcare service quality [66]. A model was created for public health facilities in Indonesia including the standard of medical treatment provided, the standard of the administrative procedure, the standard of medical staff, and the sufficiency of medical resources [67]. A hierarchical model including quality of atmosphere, interaction and consequence was developed [68] which shows substantial correlation between waiting hour, commitment to patients, happiness, and impression. The PubHosQual scale investigated five dimensions such as the procedures for admission and discharge, medical care, general service and responsibility for society to determine quality of care in public hospitals [69]. It is also stated that each of these factors significantly predicts patient satisfaction [33]. The dimensions of service quality determined are estimated waiting hour, convenience, admission procedure, appointment for consultation, physical atmosphere, patient details, consultation with doctor and estimated service costs [70]. A new dimensions for hospital service such as waiting hours and quality of doctors, medical and non-medical personnel was discovered [71]. An integrated hierarchical model was proposed which expounded a connection between service excellence, behavioural intentions, and customer satisfaction [19]. Quality in interpersonal relationships, environmental sustainability, technical proficiency and administration are the fundamental dimensions of service excellence. The elements that affect hospital service quality include medical staff and practices, behaviour and practices of human resources, healthcare delivery and sufficiency of resources and services [72]. The study directs policymakers and healthcare practitioners' attention to an instantaneous and imperative response on measured perceived service quality to improve healthcare services. A study explored eight components of high-quality healthcare such as dependability, assurance, tangibility, reaction, compassion, release, safety precautions, and medication quality control to figure out loyalty and patients' satisfaction [73]. The HospitalQual model was proposed to initiate service quality from the inpatients' perspective and identified infrastructure of hospital, safety for patients, administrative, nursing and medical facilities and interaction with patients [74]. An investigation on loyalty, satisfaction and quality of service in hospital was conducted in Pakistan [75]. The study discovered five dimensions namely safety and confidentiality, physical surroundings, responsiveness, user friendly atmosphere and interaction. A survey accustomed reliability, administrative practices, infrastructure, medical care technique, staff competency, social responsibility, safety measures and hospital reputation to investigate the service quality in hospital [55]. Another survey incorporated devotional requirements, admission and discharge protocols, interactions with patients and staff, waiting periods, visiting guidelines, and tangible in his work [76]. An investigation investigated the availability, technical and skillful assistance, food, customized services, cost, patient comforts and atmosphere as crucial dimensions in measuring quality of services of healthcare providers [77]. An inquiry identified eleven dimensions of service quality which includes dependability, politeness, interaction, tangibles, expertise, patient reaction, understanding patients' needs, response, kindness, and relationship [78]. Five dimensions propounded by a survey includes price, hygiene, attentiveness, politeness, and conversation [79]. A probe initiated trustworthiness, economy, accessibility, effectiveness, safety, and elegance to measure service quality dimensions [80]. A survey investigated accessibility, treatment, care and atmosphere as aspects of the quality of health care services [81]. A study found staff-patient connections, valuing the needs of inpatients, empathy, meals, physical surroundings and staff competency as determinants of service quality [20]. An investigation confirmed a linkage between loyalty, happiness, and quality of service [82]. It has been argued that concepts of service excellence that originate in one culture may not transfer to another [83, 84]. The literature study demonstrates that a variety of factors can affect patients' satisfaction.

III. Research Gap

1. Studies on the level of service provided by Indian health care providers are scarce.
2. A widely used approach in research on healthcare service providers is the SERVQUAL model.
3. Different studies used different parameters to define the healthcare providers' level of service.
4. Since most research has been conducted in developed nations, it cannot be broadly applied to the setting of India.

IV. Objectives of the Study

The objectives of the present study are

1. To examine previous studies on quality of services and provide insight into the health care situation in India
2. To measure service quality in a public healthcare provider
3. To identify the essential and significant determinants of service quality in a public healthcare provider that results in happiness of the patients
4. To examine the discrepancies in the opinion stated by patients on demographic characteristics namely gender, age, work, residence and disease profile for each variable
5. To establish a relationship between service quality determinants as the independent variable and patient happiness as the dependent variable
6. To propose suggestions for upgrading service quality levels in public healthcare provider

V. Hypotheses of the Study

The hypotheses developed in the study are as follows

HS1: Patient happiness is positively affected by hygiene
HS2: Patient happiness is positively affected by Infrastructure
HS3: Patient happiness is positively affected by Environment
HS4: Patient happiness is positively affected by Cost
HS5: Patient happiness is positively affected by Attitude
HS6: Patient happiness is positively affected by Satisfaction
HS7: Patient happiness is positively affected by Nutrition
HS8: Patient happiness is positively affected by Expertise
HS9: Patient happiness is positively affected by Safety

VI. Research Methodology

An exhaustive study of the current research works on healthcare service quality and patients' happiness is done. A conceptual framework of the methodology is illustrated in Figure-1.

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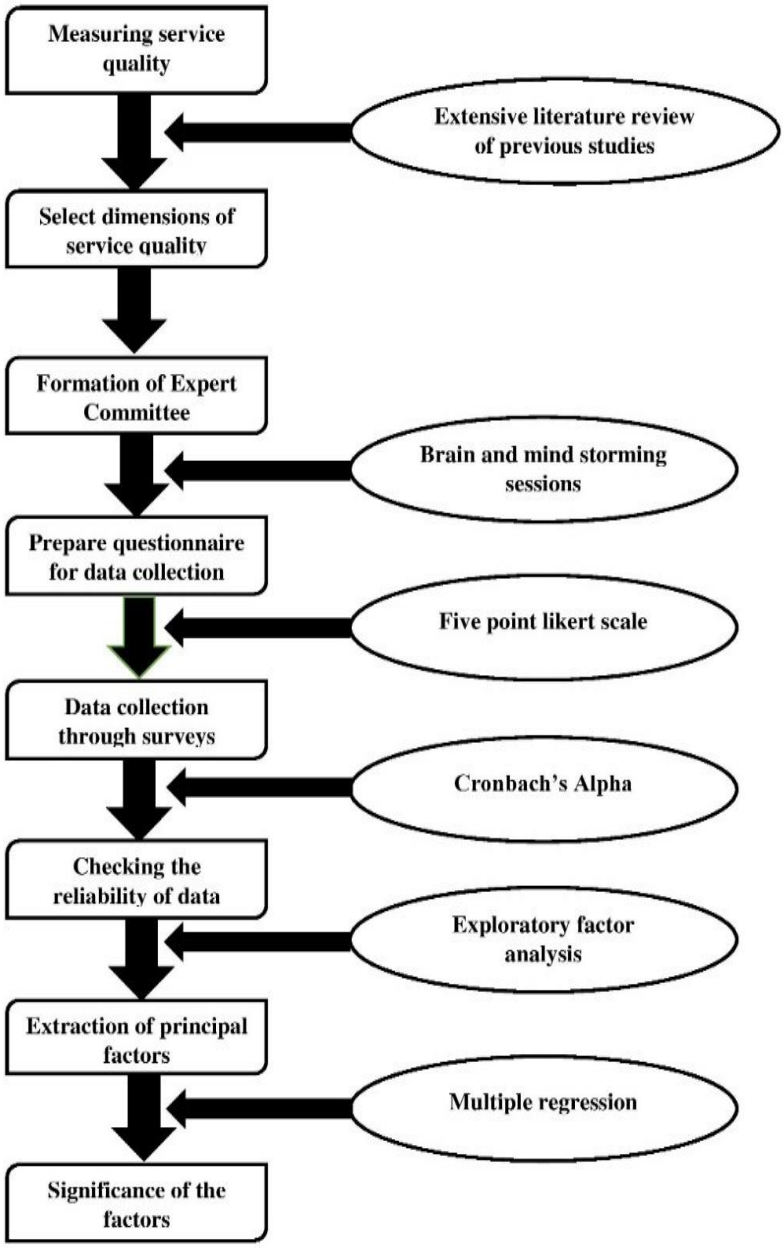

Figure- 1: A conceptual framework of the methodology

An empirical study was conducted on 480 hospital patients which includes inpatients and outpatients in two private hospital located in Kolkata, West Bengal, India. The present study adapted existing literature to incorporate the determinants of service quality [8, 20, 22, 40, 45, 69, 74, 79, 81-95]. Hygiene, infrastructure, environment, cost, attitude, satisfaction, nutrition, expertise and safety are considered to link these dimensions with happiness in healthcare service provider. Figure 2 illustrates a research paradigm.

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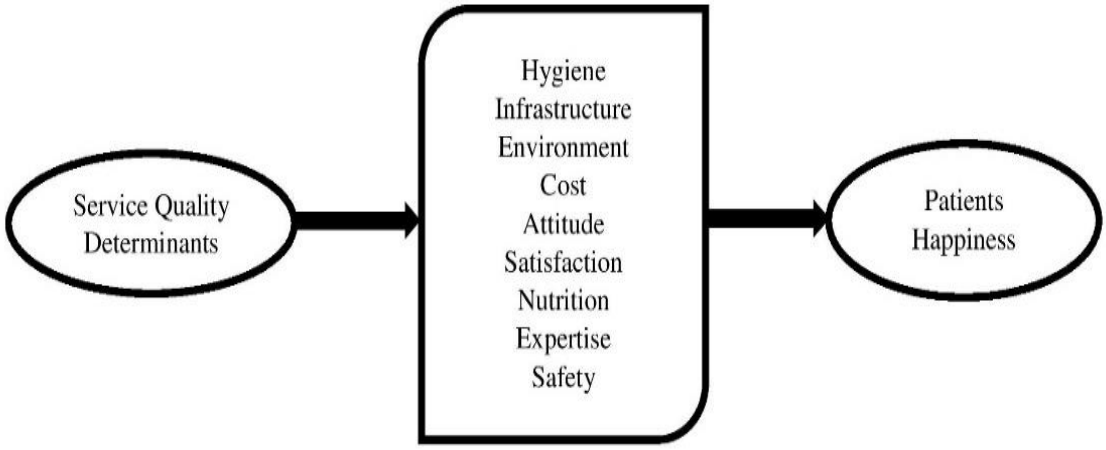

Figure-2: A research paradigm

A self-administered questionnaire was finalised using extensive conversation with hospital administrators and healthcare users. The questionnaire was pre-tested multiple times to assure proper format, term and order of questions. Out of the 600 questionnaires that were sent out, 480 were returned with a feedback rate of 80 %. The questionnaire was framed in two sections: first six questions describes the patient demography and the next 40 questions investigated patients' perception about service quality and happiness from healthcare providers. The confidentiality of their responses and their exclusive application for research studies was promised to the patients. They were instructed to carefully go through the directions and respond in line with them. A likert scale (five point) was employed to collect the response which varies between 1 to 5 from strongly disagree to strongly agree. The demographic characteristics of the patients are as shown in the Table- 2

Variable	**Types**	**Frequency**	**%**	**Variable**	**Types**	**Frequency**	**%**
Gender	Male	272	56.67	Disease	Cardiology	88	18.3
	Female	208	43.33	Description	Gynaecology	94	19.6
Age	Less than 18	16	3.3		Neurology	76	15.8
	19-30	69	14.4		Nephrology	87	18.1
	31-40	153	31.9		Urology	75	15.6
	41-60	164	34.2		General	60	12.5
	More than 60	78	16.3				
Work	Unemployed	16	3.3	Education	Primary	10	2.1
	Government	84	17.5		Secondary	86	17.9
	Private	164	34.2		Graduate	165	34.4
	Business	132	27.5		Postgraduate	144	30.0
	Retired	84	17.5		Doctorate	75	15.6
Income	<1 lakh	174	36.25	Marital status	Married	368	76.7
	1-3 lakh	193	40.21		Unmarried	112	23.3
	>3 lakh	113	23.54				

Table- 2: Demographic characteristics of the patients

VII. Results

The Statistical Package for Social Sciences (SPSS) version 26 was employed to analyse the data. Data were initially subjected to factor analysis and then followed by regression analysis. Before the factor analysis, Bartlett's sphericity and Kaiser-Meyer-Olkin (KMO) test were operated to check the significance and sample adequacy of the data. The results from these tests are illustrated in Table-3. From the table, it is observed that the KMO value of sample adequacy is 0.883 and Bartlett's test of

sphericity is 0.000, which is significant and satisfactory. Therefore the data is good enough to perform exploratory factor analysis (EFA). The principal component extraction approach with varimax rotation and kaiser normalisation was utilised in exploratory factor analysis to extract the factors. The result of eigenvalues and percentage of variance of ten extracted factors is shown in Table-4. Factor loadings less 0.45 were treated as superfluous variables and discarded. A high loading value suggests significant impact of the factor on the variable. A factor loading that is higher than 0.6 significantly affects the variables. As a result, factor loadings of forty variables grouped into ten factors were revealed. The results are shown in Table-5. These factors are named as Hygiene, Infrastructure, Environment, Cost, Attitude, Satisfaction, Nutrition, Expertise, Safety and happiness. The Cronbach's alpha coefficient is adapted for reliability measures of the entire scale. It is stated that a coefficient α value should be greater than 0.7 [97]. The ten extracted factors in our study have Cronbach's alpha values ranging from 0.718 to 0.986. The overall Cronbach's alpha of 0.947 demonstrates the reliability and efficacy of the scale. The Cronbach's alpha coefficients measures of ten extracted factors is shown in Table-6. The relative significance of each dimension is evaluated using multiple regression. The results of model summary and ANOVA is illustrated in Table-7 and Table-8. For regression modelling, out of ten extracted factors Hygiene, Infrastructure, Environment, Cost, Attitude, Satisfaction, Nutrition, Expertise and Safety were treated as the independent variables and happiness as the dependent variable. A multiple regression was performed to check the hypotheses. The findings of regression analysis implies that the relationship between Hygiene, Infrastructure, Environment, Cost, Attitude, Satisfaction, Nutrition, Expertise, Safety and happiness of the patient are statistically significant ($p<0.05$) which is illustrated in Table 9. The adjusted R square value of 0.796 also revealed that the relationship is statistically significant.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.883
Bartlett's Test of Sphericity	Approx. Chi-Square	22458.398
	df	780
	Sig.	.000

Table-3: KMO and Bartlett's test

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	14.709	36.771	36.771	14.709	36.771	36.771	3.995	9.998	9.998
2	3.971	9.928	46.699	3.971	9.928	46.699	3.909	9.773	19.760
3	3.716	9.290	55.990	3.716	9.290	55.990	3.849	9.623	29.383
4	2.312	5.779	61.769	2.312	5.779	61.769	3.606	9.015	38.398
5	1.728	4.320	66.089	1.728	4.320	66.089	3.359	8.398	46.797
6	1.395	3.487	69.576	1.395	3.487	69.576	3.274	8.186	54.983
7	1.289	3.223	72.799	1.289	3.223	72.799	3.205	8.012	62.995
8	1.189	2.971	75.770	1.189	2.971	75.770	2.928	7.320	70.314
9	1.103	2.756	78.527	1.103	2.756	78.527	2.348	5.870	76.184
10	1.018	2.546	81.073	1.018	2.546	81.073	1.956	4.889	81.073

Table-4: Eigen values and total variance explained

Sl.no	Factors	Variable	Loadings
1.	Hygiene	Availability of biodegradable and non-biodegradable dustbins around the premises	0.874
		Hospital premises is clean and well maintained	0.858
		Toilets and wash basins are clean and hygienic	0.830
		Hospital wards, cabins and corridors are hygienic, comfortable and regularly cleaned	0.657
2.	Infrastructure	Availability of modern AI techniques and updated medical devices	0.875
		Availability of ambulance and emergency services	0.871
		Availability of doctors, nurses and medical staffs	0.871
		Availability of beds in wards and cabins	0.830
3.	Environment	Lodges and restaurants are available outside the hospital premises	0.889
		Ample parking space and waiting halls for visitors are available	0.860
		Directional signage available around the premises for easy access to different departments	0.855
		Access to hospital location is easy and convenient	0.728
4.	Cost	Health insurance policies are explained properly	0.928
		Hospital wards and cabin charges are high on per day basis	0.917
		Pathological, radiological and medicine charges are high	0.826
		Doctors' charges high fees	0.666
5.	Attitude	Overall attitude and behaviour of physicians and nurses are acceptable	0.733
		Nurses are consistently supportive and helpful	0.727
		The majority of staff is not cooperative	0.723
		Physicians behaviour is not always courteous	0.628
		Physicians are constantly supportive and helpful	0.538
6.	Satisfaction	Satisfaction with the cost-effectiveness of medical care	0.835
		Satisfaction with admission and discharge processes	0.816
		Satisfaction with the quality of diagnosis and treatment	0.745
		Satisfaction with the quality of care by physicians and nurses	0.701
		Satisfaction with the assistance and administrative personnel	0.682
7.	Nutrition	Food is prepared as per doctor's prescription	0.780
		When the meals were served, they were still warm	0.755
		Food is nutritious, tasty and hygienic	0.737
		Dirty dishes were removed promptly after each meal	0.698
8.	Expertise	Expertise in handling emergency and critical cases immediately	0.839
		Doctors are sufficiently knowledgeable in their specialty	0.820
		Doctors always make accurate diagnoses and provide reasonable explanations of diseases.	0.695
		Nurses are capable of taking appropriate care of the patients	0.673
9.	Safety	Sufficient security and CCTV to stop personal property theft	0.805
		Availability of safety features including handrails, elevators, and ramps	0.780
		Adequate hygiene is maintained to prevent infections	0.657
10.	Happiness	Happy to select the same hospital again in future	0.820
		Happy to promote good word about the hospital verbally	0.682
		Happy to suggest this hospital to family and friends	0.669

Table- 5: Result of factor analysis

Sl.No	Dimension	Cronbach's α
1	Hygiene	0.945
2	Infrastructure	0.986
3	Environment	0.948
4	Cost	0.923
5	Attitude	0.919
6	Satisfaction	0.834
7	Nutrition	0.959
8	Expertise	0.849
9	Safety	0.823
10	Happiness	0.718
Overall Reliability		**0.947**

Table-6: Reliability analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.895	.800	.796	.33258

Table-7: Model summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	208.344	9	23.149	209.295	.000
	Residual	51.985	470	.111		
	Total	260.329	479			

Table-8: Analysis of variance (ANOVA)

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	.432	.100		4.327	.000
Hygiene	.107	.046	.101	2.338	.020
Infrastructure	.488	.066	.602	7.382	.000
Environment	.154	.044	.162	3.535	.000
Cost	-.206	.058	-.270	-3.570	.000
Attitude	-.252	.050	-.240	-5.050	.000
Satisfaction	.172	.024	.199	7.033	.000
Nutrition	.071	.034	.071	2.077	.038
Expertise	.082	.041	.095	2.029	.043
Safety	.275	.057	.376	4.854	.000

Table-9: Coefficients of regression

VIII. Conclusion

The present study expounds significant determinants of service quality and establish a relation between service quality determinants and patient happiness in public hospital. This study was concentrated on two private hospital in Kolkata, India. A 40-item scale that measures the quality of care provided by public hospitals has been produced by our study. The exploratory factor analysis identified ten key determinants of service standard at a private medical facility. According to the findings of our study hygiene, infrastructure, environment, cost, attitude, satisfaction, nutrition,

expertise and safety are the most important determinants of patient happiness in private hospital. Multiple regression analysis was performed to evaluate the hypotheses about the substantial impact of key determinants i.e. hygiene, infrastructure, environment, cost, attitude, satisfaction, nutrition, expertise and safety on happiness in the private hospital. The result demonstrates that all the key determinants of service quality have a significant effect on patients' happiness. It has been discovered that infrastructure is the most significant predictor of patients' happiness followed by safety and satisfaction. The items created in this investigation can be applied to keep an eye and raise the standard of the services provided to the patients. The study could assist medical professionals and healthcare administrators to identify and improve the significant dimension of healthcare and conclude a link between service quality determinants and patients' happiness in public hospital. Patients who feel uneasy about the quality of care they receive in public hospitals are increasingly prepared to resort to private hospitals or even travel overseas to a hospital in a developed nation [98]. Therefore continuous quality advancement heavily relies on healthcare administrators' understanding of service quality dimensions. The healthcare providers in Kolkata are doing well, but it still has to concentrate on a few areas to raise patient satisfaction and happiness and sustain positive relationships with patients at all levels. A survey on patient satisfaction and happiness should be conducted quarterly to learn about the patients' evolving demands.

Our research also gives important advice for healthcare providers to improve their services. Our findings might not apply to other healthcare services because our research was restricted to public healthcare providers. We may not have captured the population with our small sample. So, in future, larger sample size can be used in research to enable a profound analysis of service quality factors, patients' satisfaction and happiness. This study can be expanded to incorporate the perspective of service providers to better understand these difficulties in public hospitals

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