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Service quality of healthcare services under public private partnership

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Abstract
The purpose of this research paper is to investigate the service quality of the healthcare services under public private partnership in state of Haryana. The data was collected using questionnaire from the patients visited hospitals of Haryana. The data was analyzed with the help of exploratory factor analysis and the independent sample *t*-test for gap analysis. Conclusion derived from the results of the study that quality of healthcare services under public private partnership do not match to the customer expectations, especially related to responsiveness factor hospitals need to work upon to gain customers' confidence and interest in these services.

Keywords: service quality, healthcare sector, public private partnership

1. Introduction
There were times when the public and private sectors not only existed independently of each other but had no interdependencies as well. However, with the advancement of technologies and economic development of countries they no longer work and operate in isolation. Today the ramifications of the government policies and practices have an effect on the entire economic structure including private sector. Moreover, governments are today increasingly funding private sector to provide services in those areas where there, service delivery facilities are nonexistent. In addition to that governments now are open to using the area of expertise of private sectors in order to reduce the incubation period of new projects as well as to improve their performance. Also, there are certain areas related to social benefits such as immunization campaigns, maternity care, family planning and preventing infectious diseases where in order to expand fast and have deeper penetration government has been funding the provider of servicers in the private sector. At the same time government has taken the role of a regulator in order to ensure quality of treatment, pricing for the various treatments etc.
The model of Public private partnership has been implemented across the globe irrespective of the stage of development of the country or the financial income of a country. It is used by the various governments since it provides a viable approach to infrastructure development and delivering services wherein the expertise of the private sector in terms of capital, managerial capacity and knowhow is used to increase the efficiency and performance of the project apart from transfer of the risk. On the other hand, for the private sector it's a lucrative opportunity for capital investment as the risks are considerably reduced due to support and backing of the government. This is particularly more relevant in case of new markets or those areas where entry barriers are strong. However, an important point with regards to PPP is that the level of risk sharing by private sector and government depends on the amount of capital invested by private sector, partnership period, payment mechanism and how the negotiations are taken forward by both parties.
Keeping in view the importance of the PPP model for an economy, current study aims to measure and examine Service Quality of Health sector offered through PPP Model.

2. Review literature
Birla and Taneja (2017) [1] have analyzed the important factors, which steer the efficiency of healthcare delivery sector based on Public-Private Partnerships. The study stressed on rearrangement in framework to satisfy diverse and vast healthcare needs of the entire nation. A holistic outlook is required to execute the inclusive study in order to improve the quality of healthcare units. Tarazona and Consuelo (2016) have made a comparative analysis of Public and PPP healthcare units with the Integrated Healthcare Delivery Alzira Model on the basis of performance, cost and quality attributes. Public sector was found to be less focused on giving attention to financial risks and more on providing services to public. The study emphasized on conducting more research regarding the operations of units so as to initiate measures to improve the functions. The major limitation of the study was analysis of 5 Public-Private Partnership hospitals only while study with higher number health care units is required to get the optimum results. Ojha (2016) [7] has made a descriptive analysis of role played by Public-Private Partnership in healthcare sector for sustainable development across rural India. Public-Private Partnership ventures were found to have a positive influence on quality of health care provisions, equity and rise in competitive environment for enhancing service quality among public spheres. CII (2016) [2] has provided an evaluative framework, which documents the emerging role of Public-Private Partnership in Indian healthcare sector. Change in demography, socio-economic demands and rapid growth of the nation had led to stupendous change in the healthcare needs in the country. Raising the level of service quality, service delivery, equitable access to all as well as managing the fluctuating echelons of diseases were reckoned as the major challenges

encountered by Public-Private Partnership ventures. Lang (2016) [3] has ascertained the role of Public-Private Partnerships as an option for health infrastructure projects in emerging markets. Public-Private Partnerships act as a driving force to streamline and reform the roles, accountabilities and incentives, conflicts among the stakeholders by rearranging their roles. The study revealed that Public-Private Partnership had provided adequate performance levels in healthcare sector. Narangoda & Khatibi (2014) revealed the lack of adequate knowledge among public officials regarding Public-Private Partnerships, improper expertise and experience of the collaborations. The study emphasized on proper policy framework for Public-Private Partnerships, training to change the mindset of manpower, need to change service standards of management, infrastructural advancement and bringing stability to the political leadership in the country. Medhekar (2014) [5] highlighted the reluctance on the part of private sector to serve the poor. Hence, the study focused on executing the strategies pertaining to all the levels of society. The Corporate sector should play a major role to ensure sustainable level of health care services. Roehrich *et al*. (2014) [8] have provided an in-depth analysis of Public-Private Partnerships especially in Europe. Rise in expenditure to procure, maintain and operate public assets, motive to provide better risk management, innovative ideas in private sector, constraints in the Government's budget have led to the reasons for the adoption of Public-Private Partnerships across the globe. The study revealed that Public-Private Partnership had realized the benefits of education development, job creation, competition, innovative and health infrastructure development. Thadani (2014) [11] has given an overview regarding the evolution of Public-Private Partnership by analyzing their role in health sector. The upheavals in the services encountered by the public and private sector in terms of their motives and capacities across Asian and African Nations, especially India. Public-Private Partnerships were found to be beneficial in terms of improvement in existing infrastructural facilities, generation of additional revenue, reduction in existing cost of infrastructure, increase in number of service providers and expansion in scope of new ventures. Lee (2013) [4] has ascertained the current scenario of health-related aspects and utilities as well as examined the new ways to find the potential partners. The data was collected from 237 respondents who are mainly the Public-Private Partnership potential partner organizations, Government agencies, local Governments, hospitals and businesses in North Korea. The Non-Government Organizations support was found to be the best way to improve poverty and health standards. The study also highlighted the in appropriation of Public-Private Partnership canons of transparency, trust, inadequate legal support, competencies, lack of preparation and capacities.

3. Research Methodology

This section explains the details about the methodology used by researcher to achieve the objectives of the study. Researcher has made use of primary data, and survey method to collect the opinions of the patients towards the service quality. Five-point Likert scale was used in the study to rate the service quality. Total 12 districts of the Haryana state have been selected to conduct the survey, where government has tie up with private sector for providing Citi scan and Citi Scan and MRI Scan facilities. Exploratory factor analysis is used to explore the factors which can represent an identical set of the statements under each of the factors which are heterogeneous in nature, but consist of homogenous statements under particular factor. Factors which lead to service quality of health care services under PPP model in Haryana state have been obtained using EFA method, with Principal Component Analysis (PCA) and Varimax rotation. For gap analysis, independent sample t-test was applied.

4. Results and Discussion

This section contains the data analysis of service quality of test centre offered through PPP Model and the opinion and expectations of patients about the quality of these services.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.938**
Bartlett's Test of Sphericity	Approx. Chi-Square	20106.344
	df	780
	Sig.	.000

KMO and Bartlett's test result has been shown in above table, the value of KMO test was found to be .938 which shows that the data was adequate in order to apply factor analysis and also the variables and sample size are adequate. Moreover, Bartlett's test value was significant as the chi square was 20106.344 (df = 780) at a p-value of 0.000, which shows that there is an unequal variance in the sample used for factor analysis. This test is used to measure the homogeneity of the variances in the sample before applying the factor analysis or to measure the normality of the data.

Table 2: 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	12.711	31.777	31.777	12.711	31.777	31.777	9.351	23.376	23.376
2	5.318	13.294	45.071	5.318	13.294	45.071	5.982	14.956	38.332
3	3.990	9.974	55.045	3.990	9.974	55.045	4.621	11.554	49.886
4	2.720	6.801	61.847	2.720	6.801	61.847	3.614	9.035	58.922
5	2.379	5.946	67.793	2.379	5.946	67.793	3.549	8.872	67.793
6	.965	2.413	70.207						
7	.771	1.928	72.134						
8	.671	1.677	73.811						
9	.596	1.491	75.302						
10	.577	1.442	76.744						
11	.522	1.306	78.049						

12	.499	1.248	79.297						
13	.476	1.189	80.487						
14	.467	1.169	81.655						
15	.457	1.142	82.797						
16	.441	1.103	83.901						
17	.430	1.076	84.976						
18	.417	1.043	86.020						
19	.413	1.031	87.051						
20	.393	.983	88.034						
21	.374	.935	88.969						
22	.342	.854	89.823						
23	.325	.813	90.636						
24	.322	.805	91.441						
25	.301	.752	92.194						
26	.284	.711	92.905						
27	.280	.700	93.605						
28	.261	.651	94.256						
29	.250	.625	94.881						
30	.231	.577	95.458						
31	.219	.549	96.007						
32	.209	.522	96.529						
33	.204	.509	97.038						
34	.191	.478	97.516						
35	.186	.464	97.980						
36	.181	.453	98.433						
37	.173	.433	98.867						
38	.163	.407	99.273						
39	.149	.374	99.647						
40	.141	.353	100.000						
Extraction Method: Principal Component Analysis.									

The table 2 shows the variance table and Eigen values, on the basis of data presented in the table it can be said that total five factors are there whose eigen values is more than one, so the factors extracted throughout the study were five. The overall percentage of variance which was explained by these five factors was 67 percent and the remaining 33 percent variance can be explained by other chance factors. Total variance explained by first factor is 23 percent, second factor explains the variance 14 percent, and variance explained by third factor is 11 percent, variance explained by third factor is 9 percent. The lowest percentage of variance was explained by last factor that was 8 percent.

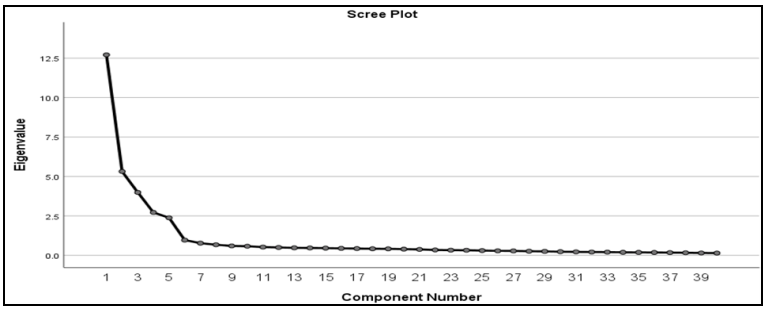


Fig 1

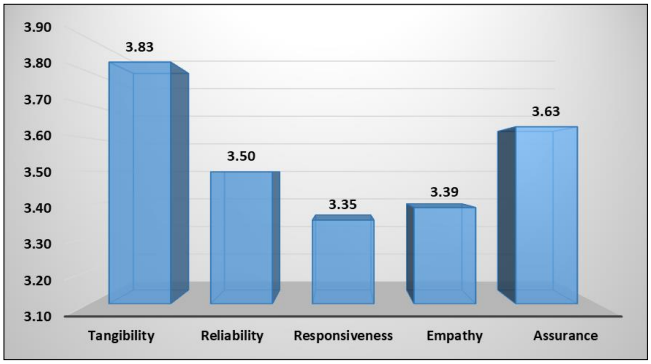
The Eigen values and the number of variables entered in the factor analysis has been shown by the screen plot. The scree plot's elbow starts from the variable 6, therefore the variables before the elbow have been considered in the study as number of factors extracted from the factor analysis. Hence, total five factors are there which represent the service quality of test centre offered by government hospitals.

Table 3: Rotated Component Matrix[a]

S.N.	Items	Latent variables				
1	Sufficient sitting space should be available for the patients and attendants while waiting for test.	.838				
2	The test centre should have modern diagnosis equipment.	.822				
3	Bedding & linen should change daily and toilets should be kept clean.	.818				
4	Ambulances should be available at all times for carrying patients to and from home in case required.	.809				
5	Safe and secure parking space should be available to park the vehicles of visitors and attendants.	.798				
6	All payment modes such as debit card, credit cards and cash should be accepted.	.797				
7	Safety measures should be in place to deal with cases such as fire, theft etc.	.792				
8	Garbage segregation system to segregate biological, non-biological and poisonous material should be available.	.789				

9	The sitting arrangement for patients and attendants at reception should be comfortable.	.785				
10	CCTVs should have been installed at all vantage position for preventing any unlawful activity.	.783				
11	Immediate power backup should be there in case of any power outrage.	.781				
12	Separate counter should have been available at the clinic for quick processing of the cashless insurance cases.	.772				
13	Stretcher and wheel chairs should be available at all vantage points for the comfort of the patients.	.758				
14	The test centre should provide diagnosis services 24/7.	.740				
15	Canteen should be available to provide meals and snacks to the attendants and patient.	.628				
1	The test centre technician should make feel safe and relax during diagnose.		.863			
2	The diagnostic services under PPP model should have been reasonably priced		.845			
3	The test centre administration should maintain the privacy and confidentiality of the patient.		.835			
4	All the reports and other details regarding treatment of the patient should be available online.		.829			
5	MRI and CT Scan machines should have been maintained in good working condition.		.813			
6	Machines in suitable quantity should be available to take care of the patients' load ensuring that no one has to wait for a long time to get the tests done.		.812			
7	The technicians of test centre should provide services at the time it promises.		.805			
8	Entire staff should be punctual and positioned at their respective position at the right time.		.789			
9	The staff should have been always willing to listen carefully and to help patient.			.813		
1	Reports should be immediately uploaded so that they can be accessed and downloaded if required.			.806		
2	An effective monitoring and measurement system should be in place with regards to customer complaint redressal efficiency.			.801		
3	All reports post testing should be generated promptly as per committed time.			.784		
4	A mechanism should exist to register customer complaints & keep track of same till final disposal.			.754		
5	The staff should exhibit friendly and caring attitude with due understanding of feelings and needs of the patients			.749		
6	Patients should be immediately intimated through phone/SMS when reports ready.			.742		
1	The administrative procedures with respect to bill payment and discharge should be very simple in order to avoid any inconvenience to attendants.				.839	
2	Feedback and suggestion box facility for patient based on their experience should be available.				.828	
3	Hospital should have sufficient number of staff to provide individual attention to patients				.819	
4	Administrative staff should be courteous and helpful while dealing with the patients and attendants.				.817	
5	The diagnostic tests should be efficiently lined up to avoid slightest of discomfort to the patient despite load.				.766	
1	The Nurses/Supporting staff should have well trained to provide necessary assistance during tests.					.834
2	The redressal of the complaints should be quick and fast while keeping the complainant in loop.					.809
3	Clear information and instructions provided by the clinic administration about the rules and procedures.					.798
4	People at the reception desk should be suitably trained to impart them competency and skill to deal with patients.					.791
5	Competency and skills of doctors at test centre should have perfect so as to diagnose the problem correctly.					.736
	Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.					
	a. Rotation converged in 6 iterations.					

Rotated solution of factor analysis showed that all the 40 statements have been divided under five dimensions of the healthcare service quality under PPP model. These dimensions are mainly; tangibility which includes total 15 statements, reliability includes total 9 statements, responsiveness includes total 6 statements, empathy includes total 5 statements and last dimension assurance includes total 5 statements.



Graph 1: Mean values

The graphical representation contains the mean value of various factors affecting the service quality practiced by the government hospital. The data reveals that the highest mean value was found to be 3.83 for tangibility, while the lowest mean value was 3.35 for responsiveness. This shows that the hospital has modern diagnosis equipment, 24/ 7 services, immediate power backup, sufficient sitting space, canteen facility, CCTVs and ambulance services etc., while the hospital needs to improve the mechanism to timely generation of reports, immediate uploading of reports, registration of customer complaints, sufficient number of staff for patients' individual attention and providing suggestion box and feedback facility.

Gap analysis

This section contains the gap between various factors which are expected from the customers and which are actually practiced by the test centre.

Table 3: Gap Analysis

	Mean (Patient expectations)	Mean (Patient perceptions)	S.D.	S.D.	t-value	Sig.
Sufficient sitting space should be available for the patients and attendants while waiting for test.	3.9631	2.3323	1.05117	1.43274	157.646	.000
The test centre should have modern diagnosis equipments.	3.7077	2.6662	.90237	1.21657	82.340	.000
Bedding & linen should change daily and toilets should be kept clean.	3.7077	3.2385	.89207	1.18805	65.640	.000
Ambulances should be available at all times for carrying patients to and from home in case required.	3.8246	3.0646	.93552	1.10140	16.954	.000
Safe and secure parking space should be available to park the vehicles of visitors and attendants.	3.9892	2.7785	.95582	1.26107	97.360	.000
All payment modes such as debit card, credit cards and cash should be accepted.	3.8246	2.3738	.96471	1.37564	142.069	.000
Safety measures should be in place to deal with cases such as fire, theft etc.	3.9246	2.5338	.99095	1.18397	70.834	.000
Garbage segregation system to segregate biological, non-biological and poisonous material should be available.	3.8323	2.8938	.97639	1.11419	19.188	.000
The sitting arrangement for patients and attendants at reception should be comfortable.	3.7846	3.1585	1.02800	1.10516	2.549	.111
CCTVs should have been installed at all vantage position for preventing any unlawful activity.	3.7077	2.3954	.95867	1.48614	181.332	.000
Immediate power backup should be there in case of any power outrage.	3.8185	2.8292	.92106	1.30664	106.250	.000
Separate counter should have been available at the clinic for quick processing of the cashless insurance cases.	3.7615	3.1892	.96634	1.20842	43.686	.000
Stretcher and wheel chairs should be available at all vantage points for the comfort of the patients.	3.8123	3.1708	.89434	1.04154	23.221	.000
The test centre should provide diagnosis services 24/7.	3.7031	3.1708	.91864	1.23885	57.305	.000
Canteen should be available to provide meals and snacks to the attendants and patient.	4.0815	2.7708	.74755	1.30475	312.337	.000
The test centre technician should make feel safe and relax during diagnose.	3.4969	2.4092	1.09241	1.38401	68.518	.000
The diagnostic services under PPP model should have been reasonably priced	3.4215	2.7446	1.00115	1.01271	.632	.427
The test centre administration should maintain the privacy and confidentiality of the patient.	3.4908	3.0062	1.12298	1.35295	29.867	.000
All the reports and other details regarding treatment of the patient should be available online.	3.5046	2.9215	1.06672	1.12473	1.475	.225
MRI and CT Scan machines should have been maintained in good working condition.	3.4600	2.8108	1.02320	1.15363	16.368	.000
Machines in suitable quantity should be available to take care of the patients' load ensuring that no one has to wait for a long time to get the tests done.	3.5262	2.8062	1.05039	1.09740	3.622	.057
The technicians of test centre should provide services at the time it promises.	3.4723	2.8646	1.02059	1.18418	21.545	.000
Entire staff should be punctual and positioned at their respective position at the right time.	3.5938	2.7462	1.04356	1.11794	7.042	.008
The staff should have been always willing to listen carefully and to help patient.	3.2323	2.2338	1.10603	1.03294	7.921	.005
Reports should be immediately uploaded so that they can be accessed and downloaded if required.	3.2969	2.6862	1.01733	1.16575	11.231	.001
An effective monitoring and measurement system should be in place with regards to customer complaint redressal efficiency.	3.4492	2.9800	1.01970	1.15963	11.190	.001
All reports post testing should be generated promptly as per committed time.	3.5138	2.7708	1.04327	1.17028	16.908	.000
A mechanism should exist to register customer complaints & keep track of same till final disposal.	3.3892	2.9215	1.03894	1.17695	3.184	.075
The staff should exhibit friendly and caring attitude with due understanding of feelings and needs of the patients	3.4800	2.7385	1.01926	1.12647	8.299	.004
Patients should be immediately intimated through phone/SMS when reports ready.	3.1092	2.8969	.99865	1.16053	12.582	.000
The administrative procedures with respect to bill payment and discharge should be very simple in order to avoid any inconvenience to attendants.	3.3615	2.7892	1.14175	1.16055	.213	.644
Feedback and suggestion box facility for patient based on their experience should be available.	3.7185	2.9415	1.11681	1.17877	4.758	.029
Hospital should have sufficient number of staff to provide individual attention to patients	3.1462	2.5600	1.01992	1.00089	.051	.822
Administrative staff should be courteous and helpful while dealing with the patients and attendants.	3.4308	2.2062	1.06012	1.06084	.656	.418
The diagnostic tests should be efficiently lined up to avoid slightest of discomfort to the patient despite load.	3.2969	2.2462	1.09467	1.04492	4.065	.044
The Nurses/Supporting staff should have well trained to provide necessary assistance during tests.	3.6369	2.8862	.98550	1.15620	25.864	.000
The redressal of the complaints should be quick and fast while keeping the complainant in loop.	3.8462	2.9323	1.02407	1.33866	89.320	.000
Clear information and instructions provided by the clinic administration about	3.7138	3.8169	1.09120	.74397	86.991	.000

the rules and procedures.						
People at the reception desk should be suitably trained to impart them competency and skill to deal with patients.	3.4323	4.0169	.93347	.90096	9.927	.002
Competency and skills of doctors at test centre should have perfect so as to diagnose the problem correctly.	3.5431	3.7354	1.01095	.86579	35.749	.000

The table 3 shows the gap analysis of various factors about the service quality provided by the government hospital under PPP model. It was found that almost all the factors were significant to the customer satisfaction except the following. The first factor was "sitting arrangement for patients' attendants at the reception should be comfortable", the second factor was "the diagnostic services under PPP model should have been reasonably priced", while the third factor was "all the reports and other details regarding treatment of the patient should be available online", the forth factor was "machines in suitable quantity should be available to take care of the patients' load ensuring that no one has to wait for a long time to get the tests done". Next factor is "a mechanism should exist to register customer complaints & keep track of same till final disposal", one more factor is "the administrative procedures with respect to bill payment and discharge should be very simple in order to avoid any inconvenience to attendants. One of the factor was "hospital should have sufficient number of staff to provide individual attention to patients" and the last factor "administrative staff should be courteous and helpful while dealing with the patients and attendants". These are the certain factors which need to be taken care off.

Conclusion

It can be concluded from the study that there are total five dimensions which represents the service quality of the healthcare services under PPP model. These dimensions are namely; reliability, empathy, assurance, responsiveness and tangibility. When these dimensions were compared then it was found that hospitals are actually doing very well on the dimension of tangibility, while the service quality score for the responsiveness factor is very low. This shows that the hospital has modern diagnosis equipment, 24/ 7 services, immediate power backup, sufficient sitting space, canteen facility, CCTVs and ambulance services etc., while the hospital needs to improve the mechanism to timely generation of reports, immediate uploading of reports, registration of customer complaints, sufficient number of staff for patients' individual attention and providing suggestion box and feedback facility. Further, the gap was derived using perceived and expected level of quality of healthcare services under PPP model, and it got revealed that the expectations of the customers are really high in comparison to what they are getting actually, gap between perceived and expected quality of healthcare services was found to be significant. This shows an alarming situation for the management of the hospitals, to improve the service quality to keep the customers satisfied.

Limitations and Future Scope

The study is limited only to the hospitals operating under PPP model in Haryana state, while there are many other states where the government has tie up with the private sector to provide services. In future, state wise study can be conducted to compare the performance of the healthcare sector after adoption of PPP model. Service quality along with other variables such as; customer satisfaction and customer loyalty can actually highlight the real scenario of the PPP model applied in healthcare services. Hence, in future studies, relationship between services quality and other variables can also be conducted.

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