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EVALUATION OF PERFORMANCE MEASURE FACTORS FOR INDIAN HEALTHCARE INDUSTRY

Sunil Das [*1], Rakesh L. Shrivastava [2]
[*1] Research Scholar, Mechanical Engineering Department, Yeshwantrao Chavan College of Engineering, Nagpur, India
[2] Professor, Mechanical Engineering Department, Yeshwantrao Chavan College of Engineering, Nagpur, India

Abstract:
This Paper aims at evaluation of Performance Measures (PMs) and its attributes in Indian healthcare. Various problems of health care industry through analysis of factors and its attributes, factor analysis, correlation and other framework parameters has been done. It was found that societal performance, Hospital Image, Treatment were the most significant PMs apart from Customer satisfaction, and Employee satisfaction. As there is no clear framework for excellence in healthcare, where stakeholders are an integral part of complete service, developed PMs and its connectivity to attributes may help to resolve the service level issues of Indian Hospital.

Keywords: *Healthcare; Hospital; Performance Measure; Patient Expectation; Quality Expectation; Service Level.*

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1. Introduction

Service level expectations from around the globe have put enormous pressure on Service industries. The expectations of the stakeholders have constrained the service provider to address competitive trends and Service related issues. This is equally true for Indian hospitality sector as well. Hospitality sector includes healthcare industry and it has provided an opportunity in raising the service standards of hospitals. In the health care industry, almost all the hospitals usually provide the same type of services, but mainly differ in quality of services (Cheng and Tang, 2000).

The study emphasizes on various issues in all those major areas in which the hospitals deal. This includes treatment time, cost feasibility, cleanliness, hygiene, patient care and comfort, privacy issues and infrastructure.

2. Challenges in Indian Healthcare Industry

Healthcare is necessity irrespective of demography, culture, income, age and gender. Inaccessibility of Healthcare Services and excellence in Indian healthcare can be seen as a contradictory statement. Expectations of people are increasing day by day, creating an environment to provide the better healthcare services. However, lack of understanding of the factors responsible for excellence and dearth of patient has created an ambiguous scenario in healthcare system. Reasons attribute to growing population, lack of infrastructure, paucity of trained work force, changing disease profile, inefficient expenditure and inaccessibility of Healthcare Services. Indian healthcare establishments, have poor operational strategies, waste management and disposal policy. They ignore the rules for monetary consideration. They have untrained ward attendants, and other supporting staff. This compels hospital managers to take appropriate decisions to improve the integration of information systems by referring to technological, environmental and organizational dimension. (Hung et al., 2015). It is essential that the organizational culture encourages and support teamwork and cross-functional evaluation of performance to help employee and organisation (Chow-Chua and Goh, 2002).

3. Literature Review

Scenario has changed from merely treatment in hospital to quality treatment as service expectation and technological advancement has changed the expectation of patient and their family. Padma et al. (2014) has put basic factor, which lead to patient dissatisfaction if not fulfilled, but do not lead to satisfaction if fulfilled. One-dimensional factor cause satisfaction if their presence is high and lead to dissatisfaction if performance is low, which is directly connected to patients need and want. Excitement factors lead to patient satisfaction, which do not lead to dissatisfaction if absent. Indifferent factors neither cause satisfaction when provided nor dissatisfaction when missing. Koumaditis et al. (2013) has held leadership responsible for organizational and infrastructural facility. Rateb et al. (2016) has listed top management commitment with highest score amongst training and education, continuous improvement and teamwork. Hariharan et al. (2004) has put patient care through better medical, nursing and paramedical in service using cross-functional approach. Drotz et al. (2014) has suggested support from Leadership in decision making through decentralization of authority, sharing of power, and active participation. Goh et al. (2013) has put safety of patient as the teamwork culture of the organization. Mosadeghrad (2013) has highlighted 50 % of the variation takes place due to incoherent culture and compatibility. Talib et al. (2011) emphasized on first impression formed at the very first service rendered that include effective food management, hygienic food and environment, confidence, treatment cost, patient focus, complaint resolution etc. Garg et al. (2014) suggests it is important for healthcare organizations to manage their staff retention in order to prevent intellectual lost and additional training cost for new employees. Sabry (2014) has found training has the highest significant correlation with quality of the service not the infrastructure as it is presumed to be an existing facility. Whereas, Dutta et al. (2014) has emphasized on physical infrastructure such as bed, equipment, tackling emergency services. Talib et al. (2015) has put India's healthcare sector needs to scale up considerably in terms of the availability and quality of its physical infrastructure as well as human resources so as to meet the growing demand and to compare favorably with international standards.

4. The Research Process

Since the measuring instrument was developed for Indian hospital, Patients, Doctors, Nursing staff, Support staff, and Management were the prime focus of study. The Service Quality practices adopted by the hospital, Doctors, Support staff and perceived by the Patients and their family were studied. The gap between Patients perceived Service Quality and received by them were analyzed. Since the objective was to develop a measurement instrument that can be used in service operations of Hospitals, hospitals with minimum 50 beds were taken into consideration. The Doctors, Nurse, Paramedical staff, Support staff, Management and Patients were interviewed personally, the stakeholders were explained the necessity of this study. Expectations of patients discharged from hospital and their concerns and experiences recorded. The model proposed by Shrivastava (2006) was taken into consideration for strong and weak factor relation. The purpose of this research was to correlate the Service Quality Critical factors. This correlation was checked after the constructs were both found to be Reliable and valid. Sixty healthcares attribute requirements for effective Service Quality practices and five constructs from forty-three hospitals were generated. Categorization process resulted in an instrument strongly grounded in through literature. The sixty requirements were termed as dependent variables as a performance factor for service quality. Flow chart for this research model is presented in Figure 1.

The dependent variables are ``service quality improvement approaches'' and "productivity improvement approaches". The dependent variables such as cleanliness of room, Treatment and outcomes, Preoperative advice by doctors, Competent paramedical & support staff, patient privacy, service administration, Reduced medicine administration errors, Visible safety rules, Facility for patient attendant, Sense of being in safe hand& regulations are some of the outcome derived from those dependent variables. All the attributes with their PMs are presented in Table 5.

Factor analysis was carried out to check the content reliability and validity as given in Table 1 and Table 2 and communalities of attributes and its correlation is given in table 3 and table 4. Internal consistency variable data was estimated using reliability coefficient such as Cronbach's alpha. Nunnally (1978) suggested that a Cronbach's alpha value ≥ 0.7 suggests good internal consistency. The overall Cronbach's alpha for independent variable was found to be 0.939, which indicated that the developed instrument was reliable. The KMO represents factors having eigen value ≥ 1 was found to be 0.636 to 0.777, which is above the minimum standard of ≥ 0.5, which indicated sample adequacy for factor analysis, and supporting the appropriateness of factor analysis to explore the listed attributes. The Bartlett's test of sphericity was highly significant ($p < 0.000$) significance value of Bartlett's test is 0.000, rejecting the null hypothesis that the important twenty-seven attributes are uncorrelated in the population. This indicates sufficient number of samples for factor analysis (Kim and Mueller, 1978).
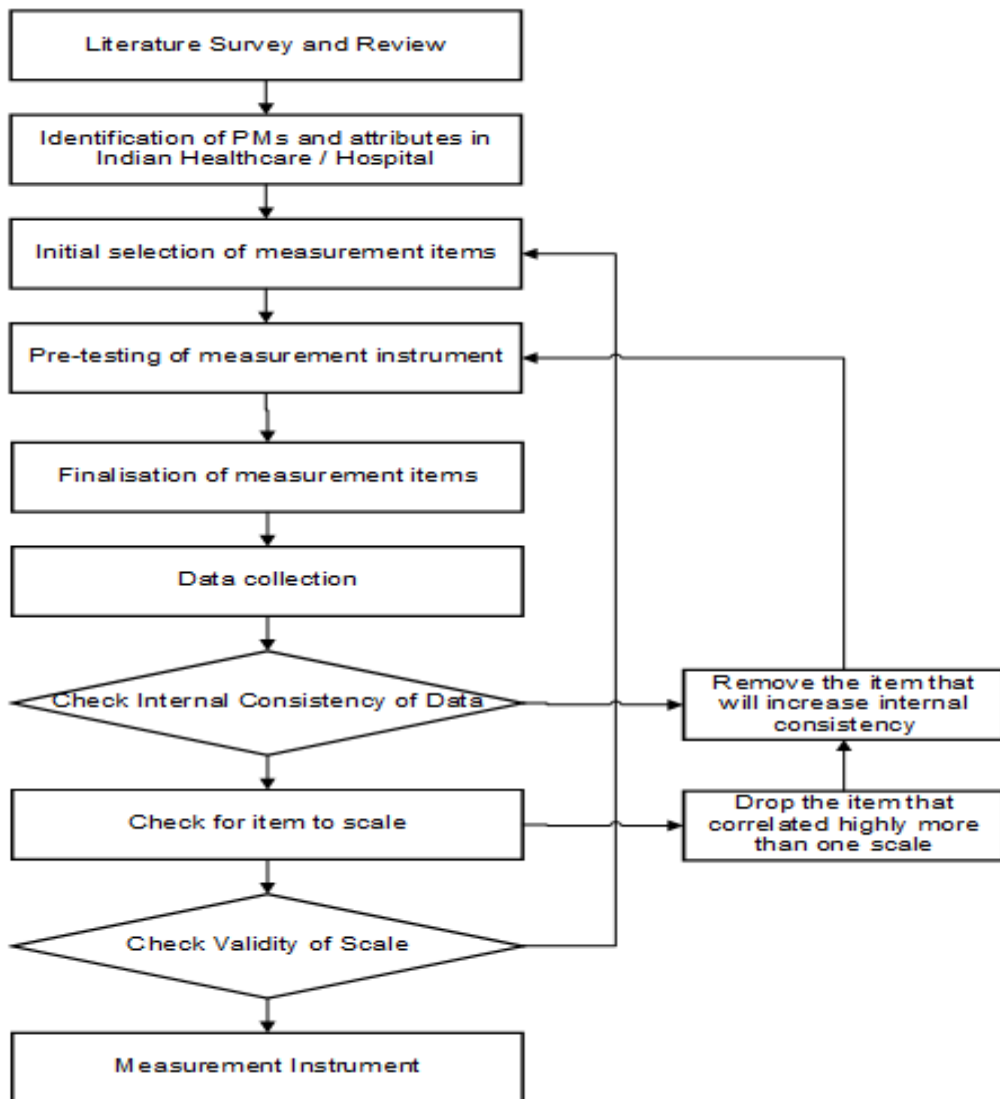
Figure1: Research process: Independent variable questionnaires scanning for measurement instrument

Table 1: Overall Reliability of all Independent variables

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.937	.939	60

Table 2: Extracted factors and reliability

S. No.	Name of Output Factors	No. of Items	Items removed	Cronbach α	KMO	Total variance explained by these factors
1.	Societal	14	10	0.803	0.738	3.160
2.	Customer	14	08	0.826	0.696	3.010
3.	Hospital Image	11	06	0.801	0.754	2.598
4.	Treatment	08	03	0.798	0.733	2.138
5.	Employee	13	06	0.861	0.690	2.832

Table 3: Communalities of Factor attributes

	PMs	Attribute:	Initial	Extraction
Factor -1	Societal performance	1. Customer Inclination	1.000	.858
		2. Linked theory & Practice	1.000	.919
		3. Error free service, treatment	1.000	.957
		4. Service on demand with minimal effort & time	1.000	.969
		5. Increased Market value of Hospital	1.000	.997
		6. Recruitment & Retention of talent	1.000	.854
		7. Minimum throughput time	1.000	.952
		8. Structured authority	1.000	.956
		9. 24 Hour pharmacy	1.000	.864
		10. Return of unused drug / medicine	1.000	.898
		11. During stay at hospital – promptness of staff	1.000	.984
		12. During stay at hospital – cleanliness of room	1.000	.986
		13. Handrails in aisles, ramp designed for wheel chair	1.000	.904
		14. Uninterrupted medical supplies service level	1.000	.982
Factor - 2	Customer satisfaction	15. Sense of being in safe hand	1.000	.997
		16. Reduced down time	1.000	.854
		17. Reduced upkeep cost	1.000	.952
		18. Increased Operation flexibility	1.000	.942
		19. Better alignment with task	1.000	.917
		20. Problem solving capability	1.000	.961
		21. Handling of unforeseen / unexpected condition	1.000	.977
		22. Friendly doctor's staff	1.000	.962
		23. Explanation about treatment and outcomes by doctor	1.000	.979
		24. Doctors explaining things in a way you can understand	1.000	.847
		25. Knowledge of doctor	1.000	.874
		26. Right time spent by doctor with you	1.000	.956
		27. Answering your question by doctor	1.000	.864
		28. Doctor explaining medical condition to you	1.000	.898
Factor - 3	Hospital Image	29. Prompt simple and clear admission procedure	1.000	.984
		30. Reduced invoicing error	1.000	.854
		31. Reduced patient complaint	1.000	.952
		32. Effective house-keeping & Laundry service	1.000	.917
		33. Clean Lobby & ward	1.000	.961
		34. Clear signboard with instruction & guidelines	1.000	.977
		35. Overall ambience, hygiene, facility & safety	1.000	.977
		36. Facility for patient attendant	1.000	.855
		37. Fair medical treatment	1.000	.854
		38. Facilitating the benefit received from supplier / government	1.000	.952
		39. Ethical principle across the organization / segments of society	1.000	.956

Factor - 4	Treatment	40. Medical advice and instruction during discharge	1.000	.864
		41. Preoperative advice by doctors	1.000	.898
		42. Clear information regarding rules and procedure	1.000	.854
		43. Ease of getting diagnostic test done	1.000	.952
		44. Reduced medication delays	1.000	.942
		45. Post-operative care by hospital staff	1.000	.917
		46. Reduced medicine administration errors	1.000	.961
		47. Fruitful treatment	1.000	.977
Factor - 5	Employee satisfaction	48. Trained and qualified staff	1.000	.962
		49. Active participation emphasizing on Quality	1.000	.917
		50. Significant positive change by using quality tools	1.000	.961
		51. Competent paramedical & support staff	1.000	.977
		52. Competency and skill of doctors	1.000	.962
		53. Teamwork by doctors and nursing staff	1.000	.969
		54. Problem solving skill	1.000	.997
		55. Able to locate waste in process	1.000	.854
		56. Applying new methods and techniques	1.000	.952
		57. Increased efficiency of Hospital	1.000	.917
		58. Updated knowledge of technology & process	1.000	.961
		59. Increased safety standard & procedure	1.000	.977
		60. Concurrent approach to problem resolution	1.000	.855

Table 4: Correlation of attributes

	Factor - 1	Factor - 2	Factor - 3	Factor - 4	Factor - 5
9. 24 Hour pharmacy	*.670*[**]	.439[**]	.419[**]	.360[**]	.255[**]
11. During stay at hospital – promptness of staff attending call on demand	*.734*[**]	.339[**]	.397[**]	.340[**]	.276[**]
12. During stay at hospital – cleanliness of room	*.801*[**]	.377[**]	.419[**]	.346[**]	.270[**]
13. Handrails in aisles, ramp designed for wheel chair	*.726*[**]	.456[**]	.465[**]	.376[**]	.205[**]
15. Sense of being in safe hand	.393[**]	*.541*[**]	.433[**]	.318[**]	.194[**]
16. Reduced down time	.287[**]	*.498*[**]	.324[**]	.425[**]	.283[**]
20. Problem solving capability	.378[**]	*.485*[**]	.261[**]	.412[**]	.183[**]
23. Explanation about treatment and outcomes by doctor	.225[**]	*.630*[**]	.308[**]	.241[**]	.241[**]
26. Right time spent by doctor with you	.256[**]	*.567*[**]	.303[**]	.266[**]	.147[**]
28. Doctor explaining medical condition to you	.244[**]	*.517*[**]	.339[**]	.108[*]	.153[**]
29. Prompt simple and 4 admission procedure	.325[**]	.426[**]	*.551*[**]	.318[**]	.197[**]
32. Effective house-keeping & Laundry service	.395[**]	.267[**]	*.466*[**]	.236[**]	.196[**]
33. Clean Lobby & ward	.422[**]	.404[**]	*.576*[**]	.292[**]	.170[**]
36. Facility for patient attendant	.281[**]	.216[**]	*.556*[**]	.207[**]	.165[**]

39. Ethical principle across the organization / segments of society	.133**	.183**	*.423**￼*	.127*	.184**
40. Medical advice and instruction during discharge by doctor	.389**	.439**	.247**	*.613**￼*	.209**
41. Preoperative advice by doctors	.211**	.183**	.182**	*.549**￼*	.164**
43. Ease of getting diagnostic test done	.429**	.419**	.386**	*.583**￼*	.240**
46. Reduced medicine administration errors	.266**	.388**	.302**	*.550**￼*	.393**
47. Fruitful treatment	.222**	.305**	.214**	*.554**￼*	.294**
48. Trained and qualified staff	.120*	.165**	.137**	.255**	*.310**￼*
51. Competent paramedical & support staff	.195**	.274**	.173**	.184**	*.787**￼*
52. Competency and skill of doctors	.179**	.132*	.159**	.073	*.654**￼*
56. Applying new methods and techniques	.370**	.383**	.354**	.322**	*.661**￼*
57. Increased efficiency of Hospital	.136**	.160**	.142**	.096	*.753**￼*
58. Updated knowledge of technology & process	.247**	.308**	.262**	.318**	*.771**￼*
59. Increased safety standard & procedure	.335**	.424**	.369**	.390**	*.694**￼*

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

___ underlined are part of the group formed

Table 5: Critical factors and their significance

Sr. no.	Critical factors for Service Quality Improvement	Explanation of Critical Factors
1	Societal performance	Structured authority, Uninterrupted medical supplies, Minimum throughput time, Linked theory and Practice, Retention of talent, Return of unused medicine, Promptness of staff, Error free treatment, 24 Hour pharmacy
2	Customer satisfaction	Problem solving capability, Friendly doctor's staff, Right time spent by doctor, Doctor explaining medical condition, Reduced upkeep cost, Doctor answering query – easy to understand, Handling of unexpected condition, Alignment with task, Sense of being in safe, Treatment and outcomes, 50 % of the variation takes place just due to cultural incoherence, reporting errors without blame, open discussion about errors, statistical analysis of error data,
3	Hospital Image	Simple and clear admission procedure, Reduced patient complaint, Clean Lobby and ward, Reduced invoicing error, Effective house-keeping & Laundry service, Facility for patient attendant, Fair medical treatment, Overall ambience, hygiene, facility & safety, Ethical principle, Clear display with instruction & guidelines
4	Treatment	Preoperative advice by doctors, Reduced medication delays, Post-operative care, Clear information regarding rules and procedure, Fruitful treatment, Reduced medicine administration errors
5	Employee satisfaction	Trained and qualified staff, Use of Quality tools, Teamwork by doctors and nursing staff, Applying new methods and techniques, Increased safety standard & procedure, Concurrent approach to problem resolution, Updated knowledge of technology

5. Analysis and Results

This explains the total Variance. Component 1 accounted for 32.311 percent of the total 100 percent of 60performance items taken simultaneously. Similarly, component 3 and component 5 contributed to 6.85 and 3.39 percent of 100%. The authors had taken 5 factors which constituted 78.63 percent of the total hundred percent cumulatively. This was done on the basis of literature review and worldwide acceptance of Scree plot for such type of study. Scree plot suggested that those components which cumulatively constitute 50 percent of the total can be taken as the remaining other components do not have significant contribution towards the study and may be discarded. However, the authors chose to represent the components which included 27 items out of 60 items under consideration**.**

6. Conclusion

Policy and decision makers in any hospital environment to assess the status of Service Quality Management. This paper will not only allow the active stakeholders of hospital to understand patient's needs and requirements about the services and its performance quality but will encourage them to implement practices they thought to be unimportant for running their business. If all the Service Quality performance attributes are considered by the hospital for implementation to improve customer satisfaction – service quality in terms of performance will get stability. The initial results concerning the measures were not as encouraging as gestation period normally is 6 to 12 months. To corroborate the results for further improvement and to the increase the customer base hospital need to do a great deal of further research in Service areas. Sample size should be higher. The authors hope that this paper will help companies in better understanding of Service Quality management and improvement.

References

[1] Clare Chow Chua, Mark Goh, (2002) "Framework for evaluating performance and quality improvement in hospitals", Managing Service Quality: An International Journal, Vol. 12 Issue: 1, pp.54-66

[2] Drotz, E. and Poksinska, B. (2014), 'Lean in healthcare from employees perspectives', Journal of Health Organization and Management, Vol. 28 No. 2, pp. 177-195

[3] Dutta, A., Bandyopadhyay S. and Ghose, A. (2014), 'Measurement and determinants of public hospital efficiency in West Bengal, India', Journal of Asian Public Policy, Vol. 7 No. 3, pp. 231–244

[4] Garg, P., and Agarwal, D. (2014), 'Critical success factors for ERP implementation in a Fortis hospital: an empirical investigation', Journal of Enterprise Information Management, Vol. 27 No. 4, pp. 402-423

[5] Hariharan, S., Dey, P. K., Moseley, H. S. L., Kumar, A. Y. and Gora, J. (2004), 'A new tool for measurement of process-based performance of multispecialty tertiary care hospitals', International Journal of Health Care Quality Assurance, Vol.17 No. 6, pp. 302-312

[6] Hung, Wei-Hsi; Chang, I-Cheng; Yen, David C.; and Lee, Che-Ming (2015), 'Critical Factors of Adopting Enterprise Application Integration Technology: An Empirical Study on Larger Hospitals', Communications of the Association for Information Systems, Volume 36, Article 31, pp. 619-641

[7]   Koumaditis, K. and Themistocleous, M. (2013), 'Service oriented architecture (SOA) implementation critical success factors in healthcare', Journal of Enterprise Information Management, Vol. 26 No. 4, pp. 343-362

[8]   Mosadeghrad, A. M. (2013), 'Obstacles to TQM success in health care systems', International Journal of Health Care Quality Assurance, Vol. 26 No. 2, pp. 147-173

[9]   Padma, P., Lokachari, P. S. and Chandrasekharan, R. (2014), 'Strategic action grids: a study in Indian hospitals', International Journal of Health Care Quality Assurance, Vol. 27 No. 5, pp. 360-372

[10] Puay Cheng Lim, Nelson K.H. Tang, (2000) "A study of patients' expectations and satisfaction in Singapore hospitals", International Journal of Health Care Quality Assurance, Vol. 13 Issue: 7, pp.290-299

[11] Rateb J. Sweis; Rawan A. Saleh; Rawan H. Al-Etayyem; Bara' T. Qasrawi; Ayat M. Al Mahmoud (2016), 'Total quality management practices and organisational performance in Jordanian courier services', International Journal of Productivity and Quality Management, Vol.19, No.2, pp.258 – 276

[12] Sabry, A. (2014), 'Factors critical to the success of Six-Sigma quality program and their influence on performance indicators in some of Lebanese hospitals', Arab Economics and Business Journal, Vol. 9, pp. 93–114

[13] Shrivastava .R.L, Mohanty R.P, Lakhe R.R.(2006), Linkages between total quality management and organisational performance: an empirical study for Indian industry, Journal of Production Planning and control, Vol 17, No. 1, pp13-30

[14] Talib, F., Rahman, Z. and Azam, M. (2011), 'Best Practices of Total Quality Management Implementation in Health Care Settings', Health Marketing Quarterly, Vol. 28(3), pp. 232–252

[15] Talib, F., Azam, M. and Rahman, Z. (2015), 'Service quality in healthcare establishments: a literature review", International. Journal. Behavioural and Healthcare Research, Vol. 5 Nos. 1/2, pp. 1-24

[16] Nunnally, J. C. (1978). Psychometric theory (2nd ed.). New York: McGraw-Hill.

[17] Kim, Jae-on & Charles W. Mueller. (1978). Introduction to factor analysis: what it is and how to do it. Beverly Hills, Calif. Sage Publications.

[18] World bank: retrieved from http://wdi.worldbank.org/table/2.15

*Corresponding author.
E-mail address:* skdnihar@ gmail.com