

Assessment Framework for Patient Satisfaction in the Context of ‘Patient Journey Mapping’ in Hospitals

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Abstract

The purpose of this study is to identify patient satisfaction attributes that will impact patient ratings in hospitals. This study demonstrates how to identify and assess the most essential and weakest attributes to increase total customer satisfaction with treatment methods, staff behavior, and the general ambiance of the healthcare center. Using extensive literature reviews and expert opinions, four enablers, nine criteria, and thirty-four attributes were identified to be analyzed and addressed. The calculated overall satisfaction index was 7.04, within a range of 7-8, representing ‘highly satisfied’. This result implies that the case hospitals have placed sufficient emphasis on customer satisfaction attributes. The results also helped identify the strongest and weakest attributes through importance-performance analysis and provided suggestions for improvement on the weaker attributes. This research will assist healthcare managers in identifying areas of focus and factors of improvement that would considerably increase the efficacy and efficiency of the flow of processes in hospitals. Maintaining the quality of services at medical institutions around the world is a major concern in the healthcare business. Hence, this paper will cover all possible patient service expectations and aid healthcare organizations in effectively adopting quality control measures.

Keywords

Patient services, Patient satisfaction, Hospitals, Patient journey mapping, Multi-grade fuzzy

1. Introduction

Healthcare is one of the largest sectors in India in terms of revenue and employment. The industry has also been growing at a compound annual growth rate of 22% since 2016. For such a large industry, patients are the cornerstones of the success or failure of healthcare improvements and innovations. Their satisfaction with facilities and service is what drives improvement in efficiency and innovations in the industry. Understanding patient needs and preferences, identifying their requirements and problems, and addressing them is the main source of resource usage in a healthcare institution. For this to be effective, it is imperative that the patient journey map of each patient be framed and closely monitored. Through this, all further strategies for the improvement of services can be tracked, and the effects of the changes made can be identified and rated for effectiveness. Ensuring that these facilities are updated with the latest and most sophisticated technology is what will drive the healthcare sector to provide better and more effective treatment for its patients. Ensuring patient satisfaction has become the main focus of all healthcare centers in the past few years. Using patient feedback as a guide, it is imperative that healthcare institutions incorporate the changes in their services and functions to ensure maximum patient satisfaction and overall positive ratings, as well as identify areas of lacunae and address them as effectively as possible.

2. Literature Review

Al-Abri and Al-Balushi (2014) performed a study on how patient satisfaction is addressed in healthcare organizations and what measures are taken to help improve the quality of all relevant dependent and independent influential attributes that contribute to overall patient satisfaction. Demographic factors like gender, age, and education did not influence satisfaction as adversely as previously assumed. Their health status played a much larger role in their satisfaction with healthcare services. The results of this paper were that the behavior of medical staff, such as nurses, in terms of courtesy, respect, and patience was an important factor in the overall satisfaction

of patients. The paper mentions that although patient satisfaction is being addressed more frequently than before, few studies are available reporting the improvements in the organization using patient feedback.

Otani et al., (2020) conducted a study on 300 hospitals with a sample size of over 85,000 people. The goal of the study was to understand how the hospital's characteristics influenced overall patient satisfaction ratings through the doctor, staff, and room attributes. A large number of hospitals were analyzed using hierarchical linear model analysis. The study was done by combining the individual patient's satisfaction as well as the average of all patients' levels of satisfaction. This was done by collecting ratings from patients. Levels of characteristics under which several attributes were taken have been considered for the study. Upon analysis, it was found that at the hospital level, attributes like medical staff, doctors, and the rooms played a major role in patient satisfaction. It was also identified that gender played a significant role in the satisfaction of services. Female patients tended to be more satisfied than males with the services of the medical staff.

Rahmqvist and Bara (2010) studied the relationship between the perceived quality of patient care in the outpatient department and the characteristics of the patients (age, gender, economic status, education, health history, etc). A questionnaire was created for the same and distributed to the patients. The sample size was 7245, with an age range of 20 and above. Through the questionnaire, ratings were collected and assessed. All types of medical specializations were considered when selecting the patient sample data. Using the data from patients of different specializations, it was easier to narrow down commonalities in the factors associated with patient satisfaction in the outpatient department. From this study, it was concluded that the age and health status of the patients were the main driving factors in the assessment of patient satisfaction. It was found that the study proved older, more healthy people were more satisfied with patient care than younger, sicker patients.

Ware et al., (1983) focused on overall patient satisfaction with healthcare with respect to salient characteristics of doctors and healthcare services such as waiting for time, insurance coverage, fees, availability, etc. The study involved using a self-administered questionnaire with a 5-point Likert scale that assessed the attitude of patients towards the features mentioned above.

Cohen et al., (1996) dealt with the consistency of patient satisfaction surveys with respect to common attributes such as the behavior of medical staff, facilities, patience, etc., which are most associated with overall patient satisfaction. The study involved performing surveys and interviews of 3 different data sets of patients for comparison of the attributes mentioned by them. Using this method, it was identified that patient courtesy, clear explanation of procedures, patience, and privacy of patient information were generally agreed upon as factors for patient satisfaction whereas characteristics like being allowed to ask questions to the doctors, and being motivated were not in agreement. It concluded that to improve the reliability of the survey data, it is necessary to cross-reference the results of surveys with evidence to further validate the results.

3. Research Methodology

3.1 Multi-grade fuzzy

The multi-grade fuzzy technique is applied in manufacturing and service industries' assessment of lean, agile, performance, safety practice level, and supply chain management effectiveness (Vinodh and Aravindraj, 2015; Sridharan and Suresh, 2016; Ganesh and Suresh, 2016; Vinodh and Chintha, 2011; Vinodh, 2011; Vimal et al., 2015; Almutairi et al., 2019).

The study used multi-grade fuzzy to assess levels of patient satisfaction in hospitals. It begins with a literature review on patient services in hospitals, and a multi-grade fuzzy assessment is conducted. A new conceptual model is framed to assess the patient satisfaction index with four enablers, nine criteria, and thirty-four attributes shown in Table 1.

Table 1. Conceptual model of patient satisfaction in hospitals

Enablers	Criteria	Attributes
Tangibles(A1)	Appearance(A11)	The appearance of doctors, nurses, and all medical staff(A111)
		Cleanliness and ambiance (A112)
		Maintenance(A113)

	Setup/Facilities available(A12)	Quality of space (open space, ventilation, illumination, etc) (A114)
		Location of pharmacy(A121)
		Location of nurse's station(A122)
		Reception desk visibility(A123)
		Seating Arrangements(A124)
Patient services(A2)	Responsiveness(A21)	Availability of Refreshments booths(A125)
		Prompt reply to patient queries(A211)
		Walkthrough of procedures(A212)
		Understanding of patient's condition(A213)
Personnel(A3)	Competence(A31)	An appropriate customized treatment plan for diagnosed condition (if any) (A214)
		Knowledge in their field(A311)
		Involvement in decision-making discussions(A312)
	Reliability(A32)	Prompt announcement of procedure schedules and cost(A313)
		Assurance of personal safety during the procedure(A314)
		Mentioning up-front all risks involved in the procedure before proceeding with treatment(A321)
	Behaviour(A33)	Handling of pre-treatment processes(A322)
		Staff courtesy(A331)
		Manner of speech(A332)
		Body language(A333)
		Response to patient queries(A334)
Treatment Procedures(A4)	Pre-treatment preparation(A41)	Entering session into medical records(A411)
		Administering of required medicines(A412)
		Briefing about possible symptoms and do's and don'ts(A413)
		Briefing the doctor of the patient's condition(A414)
		Required examinations (A415)
	Treatment process(A42)	Ease of procedure proceedings(A421)
		Patient comfort(A422)
		The skill of medical personnel involved(A423)
	Post-treatment care(A43)	Prescription of required medicine/advice(A431)
		Briefing of further treatment if required(A432)
		Billing process(A433)

4. Case Study

4.1 Case of hospital

The case hospital is located in India. Surveys were conducted on outpatients of the hospitals in the outpatient departments. These patients were receiving consultation for neurosurgical problems and had similar issues to be addressed. This helped narrow down the common recurring attributes mentioned by the patients for the undertaken study. This also helped identify attributes that were potential factors for maximum and minimum satisfaction from the perspective of the patients.

The patient satisfaction index (A) is the product of the overall assessment level of ratings based on each driver (R) and the overall weights (W) given by experts. The equation for the patient satisfaction index is $A = W \times R$ (Anil and Suresh, 2020; Suresh et al., 2020; Menon and Suresh, 2020)

The assessment is divided into 10 grades as a fuzzy assessment is to be done. $H = \{10, 9, 8, 7, 6, 5, 4, 3, 2, 1\}$. 9-10 represents 'Extremely Satisfied', 8-9 represents 'Very highly Satisfied', 7-8 represents 'Highly Satisfied', 6-7 represents 'Satisfied', 5-6 represents 'Moderately Satisfied', 4-5 represents 'Low Satisfied', 3-4 represents 'Very low Satisfied', 2-3 represents 'Extremely low Satisfied', 1-2 represents 'Not Satisfied', and less than 1 represents 'Absolutely not Satisfied'.

The patient satisfaction ratings are collected from 10 patients of case hospital, and it is shown in Table 2. For the attribute's ratings, we used a questionnaire with a 10-point Likert scale, representing extremely high (10 points) to extremely low (1 point). The reverse scale is used to capture ratings for negative attributes (minimum is best). The weightage has been collected from fifteen experts from various hospitals using a 10-point Likert scale that represents extremely high importance (10 points) to extremely low importance (1 point). The normalized mean weightages are shown in Table 2.

Primary assessment calculation

The primary calculation for "Appearance (A11)" is given below.

Weights associated with "Appearance" criterion are $W_{11} = [0.247, 0.272, 0.230, 0.249]$

Assessment for the practice of the "Appearance" criterion is given below as

$$R_{11} = \begin{bmatrix} 7 & 7 & 7 & 7 & 7 & 7 & 7 & 7 & 8 & 7 \\ 8 & 8 & 8 & 8 & 7 & 8 & 8 & 8 & 8 & 7 \\ 7 & 7 & 7 & 7 & 7 & 7 & 8 & 6 & 6 & 8 \\ 7 & 7 & 6 & 6 & 6 & 7 & 8 & 9 & 8 & 8 \end{bmatrix}$$

Index concerning "Appearance" criterion is calculated as

$$A_{11} = W_{11} \times R_{11}$$

$$A_{11} = [7.272, 7.272, 7.023, 7.023, 6.750]$$

Using this principle, the index associated with the following criterion in patient satisfaction assessment is as follows.

$$A_{12} = [7, 7.192, 6.989, 6.989, 7.192]$$

Secondary assessment calculation

The calculation of the enabler of "Tangibles (A1)" is given as the following

Weights of "Tangibles" enabler given as $W_1 = [0.478, 0.521]$

Assessment of "Tangibles" enabler is given as below

$$A_1 = \begin{bmatrix} 7.272 & 7.272 & 7.023 & 7.023 & 6.750 \\ 7.000 & 7.192 & 6.989 & 6.989 & 7.192 \end{bmatrix}$$

Index concerning of "Tangibles" enabler is given by

$$A_1 = W_1 \times R_1$$

$$A_1 = [7.130, 7.230, 7.005, 7.005, 6.981]$$

The index related with the following enablers of patient satisfaction assessment is calculated using this principle:

$$A_2 = [7.252, 7.252, 7.252, 7.252, 7]$$

$$A_3 = [6.991, 6.832, 6.831, 6.833, 6.918]$$

$$A_4 = [7.111, 7.227, 7.124, 6.905, 6.769]$$

Table 2. Weights and performance ratings from experts and patients

Ai	Aij	Aijk	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Wijk	Wij	W
A1	A11	A111	7	7	7	7	7	7	7	7	8	7	0.2470	0.4782	0.2487
		A112	8	8	8	8	7	8	8	8	8	7	0.2729		
		A113	7	7	7	7	7	7	8	6	6	8	0.2305		
		A114	7	7	6	6	6	7	8	9	8	8	0.2494		
	A12	A121	7	7	7	7	7	7	7	6	6	6	0.1978	0.5217	
		A122	7	7	7	7	8	7	7	7	7	8	0.2032		
		A123	7	7	6	6	6	6	6	8	8	7	0.2032		
		A124	7	8	8	8	8	8	8	8	7	7	0.1923		
		A125	7	7	7	7	7	7	7	7	7	7	0.2032		
		A211	7	7	7	7	7	7	7	7	7	7	7		
A212	8	8	8	8	7	7	7	7	7	7	7	0.2528			
A213	7	7	7	7	7	7	7	7	7	7	7	0.2597			
A214	7	7	7	7	7	7	7	7	7	7	7	0.2459			
A3	A31	A311	7	6	6	6	7	7	7	7	7	7	0.2403	0.3253	0.2439
		A312	8	7	7	7	7	6	6	7	7	7	7		

A4	A32	A313	7	7	7	7	6	6	6	7	7	7	0.2494	0.3343	0.25	
		A314	6	6	7	7	7	7	6	6	7	7	7			0.2585
		A321	7	7	7	7	7	7	7	7	7	7	7			0.5071
		A322	7	7	7	7	7	7	7	7	6	6	7			0.4928
	A33	A331	8	8	8	7	7	7	7	7	7	8	7	0.2429		0.3403
		A332	6	6	6	6	7	7	7	7	7	7	7	0.2593		
		A333	6	7	6	7	7	7	7	7	7	7	7	0.25		
		A334	8	7	7	7	7	7	6	7	7	8	7	0.2476		
	A41	A411	8	7	7	7	7	7	8	8	7	7	7	0.1954		0.329
		A412	6	7	7	7	6	7	7	7	6	7	7	0.2049		
		A413	7	7	7	7	7	7	6	6	6	6	7	0.2030		
		A414	7	7	7	7	6	6	6	6	7	7	7	0.2068		
A415		7	7	7	7	7	6	6	6	6	7	7	0.1897			
A42		A421	7	7	6	6	6	7	7	7	7	7	7	0.3194	0.3225	
		A422	7	7	7	6	6	6	6	6	8	8	7	0.3418		
		A423	8	8	8	7	7	7	7	7	7	8	7	0.3386		
A43		A431	6	7	7	7	7	6	6	6	6	7	7	0.3248	0.3483	
	A432	8	8	8	8	8	7	7	7	7	7	7	0.3407			
	A433	7	7	7	7	7	7	6	6	6	7	7	0.3343			

Tertiary assessment calculation

The patient satisfaction assessment value of the case hospital has been calculated as follows

Complete weight $W = [0.248, 0.258, 0.243, 0.248]$

$$\text{Complete assessment vector } R = \begin{bmatrix} 7.130 & 7.230 & 7.005 & 7.005 & 6.981 \\ 7.252 & 7.252 & 7.252 & 7.252 & 7 \\ 6.991 & 6.832 & 6.831 & 6.833 & 6.918 \\ 7.111 & 7.227 & 7.124 & 6.905 & 6.769 \end{bmatrix}$$

Patient satisfaction index $A = W \times R$

$A = [7.123, 7.138, 7.056, 7.002, 6.918]$

The final patient satisfaction index is the average of $A = 7.04 \in (7 \text{ to } 8)$. \therefore 'Highly Satisfied'

4.2 Importance Performance Analysis (IPA)

IPA is widely used in manufacturing and service industries for classifying attributes based on their importance and performance (Tzeng and Chang, 2011; Chacko et al., 2021; Vaishnavi and Suresh, 2021; Sreedharshini et al., 2021). In IPA, the x-axis represents the performance rating of the attributes, and the y-axis represents their importance. The mean of the x-axis is 6.96 and the mean of the y-axis is 7.13, represented as a perpendicular line in the given Table 3.

Table 3. IPA analysis for patient satisfaction assessment of case hospital

Importance ↑	7.8	Quadrant -I				Quadrant -II				A112
	7.7									
	7.6	A314				A213				
	7.5									
	7.4	A332	A123,A313		A312	A125		A122	A212	
	7.3		A414							
	7.2	A413	A121,A412, A422	A333		A214, A321			A432	
	7.1									
	7		A311, A433	A322		A211	A111, A334	A114	A331, A423	A124
	6.9							A411		
	6.8	A431								
	6.7		A415,A421							
6.6					A113					

	6.5	Quadrant -IV						Quadrant -III						
	6.5	6.6	6.7	6.8	6.9	7	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8
	Performance Rating →													

Quadrant I (concentrate here): The attributes in the quadrant need to be paid attention to by the case-hospital managers to increase the patient satisfaction level of their operations (Thomas and Suresh, 2022). The attributes are “location of pharmacy; reception desk visibility; availability of refreshments booths; understanding of patient's condition; an appropriate customized treatment plan for diagnosed condition(if any); involvement in decision making discussions; a prompt announcement of procedure schedules and cost; assurance of personal safety during the procedure; mentioning up-front all risks involved in the procedure before proceeding with treatment; manner of speech, body language; administering of required medicines; briefing about possible symptoms and do's and don'ts; briefing the doctor of the patient condition; patient comfort”.

Quadrant II (Keep up the good work): The attributes in the quadrant can be maintained as such and the attributes are “cleanliness and ambiance; location of nurse's station; walkthrough of procedures; briefing of further treatment if required”.

Quadrant III (Possible overkill): The attributes in this quadrant are of minimal importance but have high performance (Subramanian and Suresh, 2022). The performance of these attributes should be minimized. The attributes are “the appearance of doctors, nurses, and all medical staff; quality of space (openness, illumination, etc.); seating arrangements; staff courtesy; response to patient queries; entering session into medical records; the skill of medical personnel involved”.

Quadrant IV (Low priority): The attributes in this quadrant are of minimal importance and have minimal performance (Suresh and Gopakumar, 2021). The attributes are “maintenance; prompt reply to patient queries; knowledge in their field; handling of pre-treatment processes; required examinations; ease of procedure proceedings; prescription of required medicine/advice; billing process”.

5. Results and discussions

A few suggestions for the improvement of the weaker attributes are given in Table 4.

Table 4. Suggestions for weaker attributes

Weaker attributes	Suggestions for improvement
Location of pharmacy	• At the front of the hospital or inside the lobby is ideal
Reception desk visibility	• At the entrance door with identifiable signs
Availability of Refreshments booths	• Near the patient waiting areas or near the lobby
Understanding of patient's condition	• Prior knowledge of the condition and reassurance
An appropriate customized treatment plan for diagnosed condition (if any)	• Tailor-made plans to suit the lifestyle of the patient as much as possible
Involvement in decision-making discussions	• Informing the patient of all the implications of each step of the treatment process to help them make decisions
Prompt announcement of procedure schedules and cost	• Estimate the cost of treatment before starting the process and the duration of treatment.
Assurance of personal safety during the procedure	• Records of medical personnel
Mentioning up-front all risks involved in the procedure before proceeding with treatment	• Implications of all treatment methods and medicines involved and possible side effects.
Manner of speech	• Polite and formal
Body language	• There should be no excessive movement and a calm demeanor.

Administering required medicines	<ul style="list-style-type: none"> Only trained personnel are permitted. Avoid asking amateurs to administer without guidance
Briefing about possible symptoms and do's and don'ts	<ul style="list-style-type: none"> Mention all the factors to consider and avoid during and after treatment
Briefing the doctor of the patient's condition	<ul style="list-style-type: none"> Getting the doctor up to speed before they see the patient helps them understand the condition better
Patient comfort	<ul style="list-style-type: none"> Patient feedback through every step of the process and their immediate implementation.

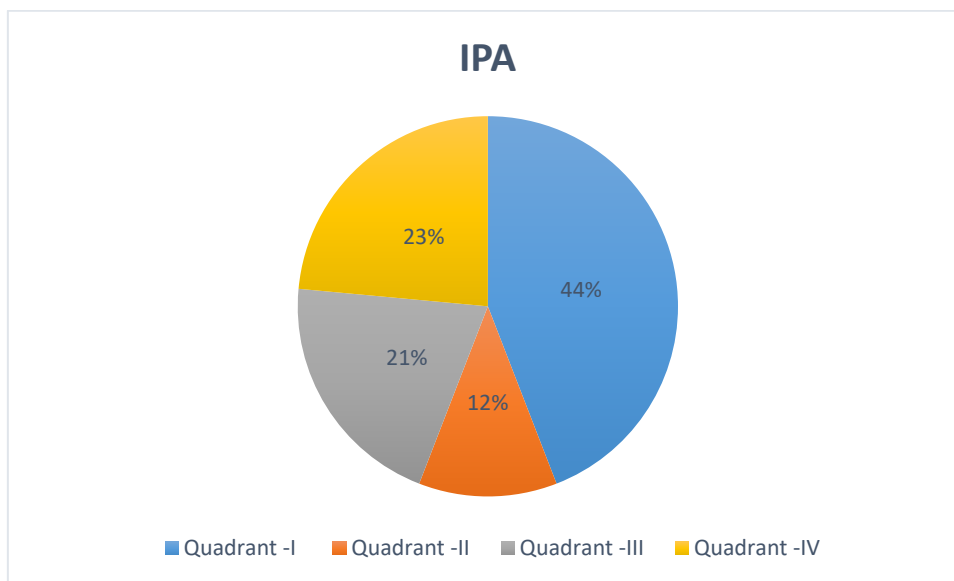


Figure 1. The percentage of number of factors in each quadrant.

Figure 1 represents the percentage of number of factors in each quadrant. The attributes in the quadrant I need to be paid attention to by the case-hospital managers to increase the patient satisfaction level of their operations.

6. Practical Implication

The practical implications of the study majorly depend on how patient feedback is collected, considered, and analyzed. Using the analyzed information in the form of quality improvements in terms of performance and quality of service is the ideal situation. Several research papers cover the necessity for patient satisfaction feedback and how it can benefit the improvement of the quality of healthcare across the world. But there are very few recorded instances of the feedback being implemented in the form of quality control measures. This is mainly due to the fact that patient satisfaction is a very difficult aspect of the medical care service industry to gauge as it is highly subjective and all patients have their own standards. This study can help by identifying commonalities and relations among all the attributes generally involved in discerning satisfaction levels. Medical management teams can use this information to help identify areas of focus and factors of improvement that would greatly enhance the effectiveness and efficiency of the flow of processes in healthcare centers.

7. Conclusion

A major issue in the healthcare sector is maintaining the quality of services in medical institutions all over the world. This paper will be one of many such studies which document all possible expectations from patients in terms of service and help healthcare institutions implement quality control measures effectively. This research framework will assist healthcare managers to find patient satisfaction level in their hospital and identifying on weaker attributes of the flow of processes in their hospital.

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