

# PATIENT SATISFACTION AS AN INDICATOR OF QUALITY CARE.-A STUDY WITH REFERENCE TO SIX SIGMA IMPLEMENTATION IN MEDIUM SCALE HOSPITALS

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## ABSTRACT

Six Sigma is an innovative program that uses data analysis to achieve defect free processes and to decrease variation. The medium scale hospitals being not financially sound like corporate hospitals implementing six sigma programmes in the hospital require an exhaustive investigation on suitability of the same and how to prioritize the projects so that the vital few will bring better change in the quality improvement of the hospital.

This study explains about the various factors to be addressed to measure the patient satisfaction at outpatient level in medium scale hospitals and how to reach conclusion to select improvement projects. The study concludes the suitability of patient satisfaction measure as an indicator of quality health care by addressing the satisfaction anchors for outpatients. The scope for initiation of six sigma projects using satisfaction indices is also traced in this work.

**Key words:** six sigma, patient satisfaction, satisfaction factors, CTQs, percentage of disagreement,

## I. INTRODUCTION

six sigma is the business philosophy with statistical background, used by manufacturing organizations, to avoid defects in the processes so that the quality level of the output reaches near to zero (statistically six sigma allows only 3.4 defects per million opportunities). Since the processes are having similarities in manufacturing and service, the concept got its applicability in service sector also. Health care being a vulnerable sector, for service to human, the zero defect approach will be the most suitable one, and the way towards the same being six sigma, making six sigma success becomes extremely important. Six Sigma practitioners across the globe are trying to accomplish similar objectives. Some might be surprised that these goals do not vary much from countries where Six Sigma is just beginning to take root. To those who work as Six Sigma practitioners in organizations, Six Sigma has become a way of life. Quality of care has become a focal point in healthcare. Hospitals and health systems continue to produce care that varies in quality. This leads to customer dissatisfaction as well as inefficient processes and output.

### *Conceptual Framework*

The fundamental objective of the Six Sigma methodology is the implementation of a measurement-based strategy that focuses on process

improvement and variation reduction through the application of Six Sigma improvement projects. This is accomplished through the use of two Six Sigma sub-methodologies: DMAIC and DMADV.

### *DMAIC and DMADV in Six Sigma*

DMAIC in Six Sigma is used to improve a process. DMAIC is the acronym for the following:

- Define the project, process and voice of the customer
- Measure the current process performance
- Analyze to determine and verify the root cause of the focused problem
- Improve by implementing counter-measures that address the root causes
- Control to maintain the gains.

DMADV is used to design a process, product or services. DMADV is the acronym for the following:

- Define the project
- Measure and determine customer needs
- Analyze the design options to select one that best meets customer needs
- Design the detailed processes
- Verify the design performance

- this systematic design methodology can build processes that will reliably meet customer expectations.

*Measuring patient satisfaction:*

Positive patient satisfaction impacts both the business results and quality of the healthcare provider in the following ways:

- Satisfied patients refer others and return to the provider for future care, increasing the volume and market share of the provider.
- Patients who feel good about their healthcare provider are less likely to consume staff time with complaints or take legal action.
- Satisfied patients are also presumed to comply with the recommendations and procedures of the provider and have better outcomes.

Seven practical recommendations for patient satisfaction monitoring are:

1. Use consistent and established methods and measures to obtain reliable and comparable data.
2. Focus on areas of dissatisfaction and use a Six Sigma philosophy to effectively achieve improvements when the overall satisfaction level is already high.
3. Monitor changes at several points during treatment to measure patient satisfaction.
4. Use a sound quality program addressing clinical outcome in addition to satisfaction measures.
5. Use satisfaction data to help frame customer service and marketing programs. For example, interpersonal communications training for caregivers addresses an essential element of patient satisfaction. Staff will benefit from learning how to handle common patient complaints. A provider can gain a competitive edge by promoting the elements patients value, such as the facility, privacy and a compassionate staff.
6. Implement a quality improvement strategy that involves the caregivers. Clinical staff must be committed to the quality process, and the institution needs to create an environment and culture that stress patient satisfaction and involve staff.

7. Publicizing positive comments from patients can give staff members a morale boost as they do their work in an increasingly challenging healthcare market.

As a critical element of healthcare quality management, patient satisfaction affects both the business results and quality of the healthcare provider. By using established and consistent measures and methods, healthcare providers can achieve high levels of patient satisfaction.

*About the study:*

The weightage given by different doctors of the medium scale hospitals for the CTQs (having 100% to 80% weightage) in the general context of hospital care in the descending order are

1. Accuracy of lab results
2. Speed and accuracy of admission
3. Patient satisfaction
4. Care coordination by nursing staff and
5. Externally hired specialty

Out of this patient satisfaction is taken as the first CTQ for study and by brain storming it is understood the following processes are highly accountable for patient satisfaction other than curative processes.

1. The outpatient department activities.
2. Billing accuracy
3. cost of processes
4. The length of stay in the hospital
5. The counseling by doctor
6. Care by nursing staff
7. Information on illness/treatment
8. Comfort of stay for inpatients

The cause and effect diagram is as shown below.

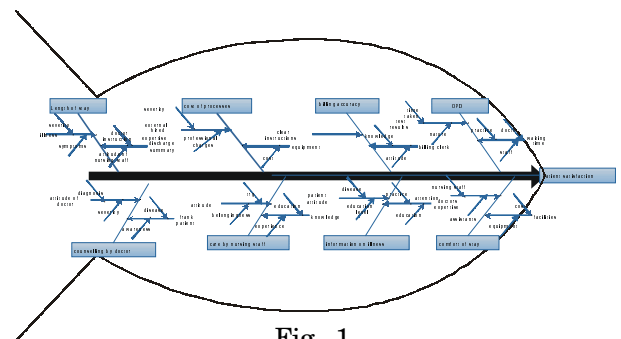


Fig. 1

**II. CAUSE AND EFFECT DIAGRAM FOR PATIENT SATISFACTION**

The objective of this study is to measure the patient satisfaction based on the possible factors which have impact on the satisfaction of out- patients. The standard questionnaires are referred and the doctors of the medium scale hospitals are consulted to finalize the use of the questionnaire as the instrument. The study will give the satisfaction index based on the factors satisfaction with doctors, access,

nursing care, facilities, appointments, and general satisfaction with the service provided by the medium scale hospitals.

The response is in a 5 point scale ranging from least satisfaction to the highest. An index of satisfaction can be developed by giving weights to questions. The increase in index can show continuous improvement and that can explain about the methodology is working.

The study is conducted by taking 300 samples from 12 medium scale hospitals 25 samples each with the help of reception staff at registration. The samples are chosen only from out patient adults above the age of 21 and who have visited the hospital more than 5 times.

The results are given in the table for each factor.

*Satisfaction With Doctors*

The following statements related to satisfaction with doctors as sub elements are reviewed by the patients on a 5 point scale.

1. The doctor clearly explains what is wrong before giving any treatment
2. The doctor does enough tests to find out what is wrong
3. The doctor used to tell me enough about the treatment
4. The doctor is always interested in explaining the reason for medical test.
5. The doctor fully explains how the illness will affect my future health
6. The doctor is very careful to check everything when examining me.
7. The doctor always asks about how my illness affects everyday life

8. I never feel I have not been given enough information by the doctor
9. Never the doctor makes me feel I am wasting his/her time
10. I feel confident in discussing my problems with the doctor
11. The doctor never wants to get rid of me at the earliest
12. The doctor gives me every chance to talk about all my problems
13. The doctor never fails to appreciate how ill I am
14. The doctor shows a genuine interest in my problems
15. The doctor does everything needed to arrive at a diagnosis
16. The doctor always puts me at ease
17. The doctor is very understanding
18. Even when the doctor is busy I am examined properly
19. The doctor knows when tests are necessary
20. I do not feel rushed when I am with the doctor
21. The doctors give more respect to me.
22. Doctors here explain the medical terms clearly to me.
23. Doctors never expose me to unnecessary risk
24. My doctors treat me in a very friendly and courteous manner.
25. Doctors are not business like in this hospital.

**Table 1. Satisfaction with Doctors**

Sub element no	Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	Mean weight
	weightage					
	1	2	3	4	5	
1	12	27	55	97	109	3.88
2	36	82	24	74	84	3.29
3	47	55	16	103	79	3.37
4	31	42	54	94	79	3.88
5	16	45	38	112	89	3.71
6	27	19	87	132	35	3.43
7	32	29	91	67	81	3.45
8	34	48	66	97	55	3.3
9	37	42	45	84	92	3.51
10	21	36	29	124	90	3.75
11	27	46	61	89	77	3.48
12	41	32	51	89	87	3.5
13	37	29	42	103	89	3.59

Sub element no	Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	Mean weight
	weightage					
	1	2	3	4	5	
14	22	36	39	96	107	3.77
15	34	29	45	112	80	3.58
16	36	32	29	86	117	3.72
17	23	31	12	121	113	3.9
18	39	36	37	98	90	3.55
19	17	29	45	128	81	3.76
20	23	33	42	104	98	3.74
21	28	36	39	94	103	3.69
22	69	56	16	80	79	3.15
23	16	41	38	94	111	3.81
24	32	24	18	108	118	3.85
25	37	31	69	86	77	3.45
Satisfaction index						3.604

**Satisfaction with Access**

The following statements related to satisfaction with access as sub elements are reviewed by the patients on a 5 point scale.

1. I feel it is easy to speak to my doctor by telephone.
2. The doctor is always available to give advice over the telephone.
3. I have easy access to the medical specialists I need.
4. I am satisfied with the out of hours service.
5. The hospital has good facilities for dealing with emergencies which occur when the any procedure is over/ delayed.
6. The receptionists ask patients the right questions.
7. The receptionists explain things clearly to me.
8. I can speak to a receptionist privately if I wish

**Table 2. satisfaction with access**

Sub element no	Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	Mean weight
	weightage					
	1	2	3	4	5	
1	80	85	23	69	43	2.7
2	121	91	35	24	29	2.16
3	24	29	54	95	98	3.71
4	47	42	16	98	97	3.52
5	38	47	54	86	75	3.38
6	34	45	43	96	82	3.49
7	79	86	32	74	29	2.63
8	79	84	67	45	25	2.51
Satisfaction index					3.013	

**Satisfaction with Nursing Care**

The following statements related to satisfaction with nursing care as sub elements are reviewed by the patients on a 5 point scale.

1. The nurses in the hospital take care to explain things carefully.
2. The nurses always listen carefully when I talk about my problems
3. The duty nurse/s is/are always very supportive.
4. The duty nurse/s never makes me feel that I'm wasting his/her time

**Table 3. Satisfaction with nursing care**

Sub element no	Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	Mean weight
	weightage					
	1	2	3	4	5	
1	54	41	34	97	74	3.32
2	65	36	54	79	66	3.15
3	47	56	32	82	83	3.33
4	57	65	23	76	79	3.18
Satisfaction index						3.245

**Satisfaction with Appointments**

The following statements related to satisfaction with appointments as sub elements are reviewed by the patients on a 5 point scale.

1. Getting an appointment at a convenient time is easy
2. The procedure for getting appointments are simple.
3. It is not difficult to get an appointment with a doctor
4. It is easy to see the doctor of my choice .
5. Waiting time to see doctor at this hospital is not high

**Table 4. satisfaction with appointments**

Sub element no	Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	Mean weight
	weightage					
	1	2	3	4	5	
1	21	39	67	114	59	3.5
2	35	48	21	89	107	3.62
3	42	47	34	94	83	3.43
4	27	38	39	108	88	3.64
5	57	78	46	67	52	2.93
Satisfaction index						3.424

**Satisfaction with Facilities**

The following statements related to satisfaction with facilities as sub elements are reviewed by the patients on a 5 point scale.

1. The location of the hospital ensures easy access by any means of transport.
2. The hospital buildings are designed to give comfort.
3. The waiting room is very comfortable & Hygienic.
4. There are enough seats in the waiting room
5. The seats available in the waiting room are comfortable.
6. This hospital is having everything needed to provide medical care.

**Table 5. Satisfaction with facilities**

Sub element no	Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	Mean weight
	weightage					
	1	2	3	4	5	
1	68	84	23	57	68	2.91
2	76	68	43	65	48	2.8
3	59	77	65	49	50	2.85
4	89	92	23	59	37	2.54
5	65	59	47	65	64	3.01
6	67	72	65	49	47	2.79
Satisfaction index						2.817

**General Satisfaction**

The following statements as sub elements are reviewed by the patients on a 5 point scale.

1. Patients receive the best care from the staff working in this hospital.
2. I have absolute faith and confidence in the doctors.
3. I am satisfied with my doctor
4. I am happy about the treatment given by this hospital
5. I feel perfectly satisfied with the way I am treated during treatment.
6. The medical care I am receiving is just perfect
7. I have no idea of changing to another hospital

**Table 6. General satisfaction**

Sub element no	Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	Mean weight
	weightage					
	1	2	3	4	5	
1	54	38	46	96	66	3.27
2	26	39	87	86	62	3.4
3	19	22	49	138	72	3.74
4	24	31	78	124	43	3.44
5	29	37	65	116	53	3.42
6	32	43	57	148	20	3.27
7	27	34	73	94	72	3.5
Satisfaction index						3.434

The overall patient satisfaction index considering all the factors is 3.26 which shows much more scope is there to improve the quality related processes in medium scale hospitals.

Pareto analysis is applied to this data which explains the order of priority in which the factors are to be attended to for improvement.

**Table 7. comparison of responses**

Sl. No	Satisfaction Factor	Percentage of Response in					Satisfaction Index
		Strongly Disagree	Disagree	Not Certain	Agree	Strongly Agree	
1	Doctors	10.32	12.61	14.51	32.96	29.60	3.604
2	Access	20.92	21.21	13.50	24.46	19.91	3.013
3	Nursing care	18.58	16.50	11.92	27.83	25.17	3.245
4	Appointments	12.13	16.67	13.80	31.47	25.93	3.424
5	Facilities	23.55	25.11	14.78	19.11	17.45	2.817
6	General	10.05	11.62	21.67	38.19	18.47	3.434
Overall average response		15.93	17.28	15.03	29.00	22.76,	

Considering the disagreement as indicator of defective processes or transactions the order in which the factors are to be looked into will be

**Table 8 Pareto Analysis**

Sl.No	Satisfaction Factor	Percentage of disagreement	Satisfaction Index
1	Facilities	63.44	2.817
2	Access	55.63	3.013
3	Nursing care	47	3.245
4	General	43.34	3.434
5	Appointments	42.6	3.424
6	Doctors	37.44	3.604

The sub elements in this satisfaction factors also can be prioritized in the same way to find the factor to be attended first to improve the satisfaction level of patients. The present processes by which the activities are done also can be improved so that the disagreement level of the patients can be reduced.

For example the satisfaction with facilities is having more disagreement level and by analysis it shows the number of seats in the waiting room and the facilities to provide medical care are to be attended first and then the comfort and hygiene of the waiting room. Each one can be attended with a focus to reduce the disagreement level and check whether any process improvement is possible.

### III. ANALYSIS OF VARIANCE:

It is to identify whether there is any significant difference between satisfaction with facilities and patient satisfaction levels.

Since the facilities have so much of disagreement level the same have been taken for analysis.

#### Hypothesis Formulated

Null hypothesis H0: There is no significant difference between the satisfaction level of location to ensure easy access and design of building to give comfort

Alternate hypothesis H1: There is significant difference between the satisfaction level of location to ensure easy access and design of building to give comfort

**Table 9 Analysis of Variance**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	14.422	4	3.606	1.592	.176
Within Groups	668.148	295	2.265		
Total	682.570	299			

The results show that the satisfaction levels differ between location to ensure easy access and design of building to give comfort significantly.

If we compare the satisfaction levels of the factors for facilities with the general satisfaction the anova results are as follows.

The inference of the anova results shows that

1. The patients don't want to change the hospital because there is no significant difference between the satisfaction level on decision on changing the hospital and the location of the hospital to ensure easy access by any means of transport
2. The patients want to change the hospital because there is significant difference between the satisfaction level on decision on changing the hospital and the comfort on the hospital building design.
3. The patients want to change the hospital because there is significant difference between the satisfaction level on decision on changing the hospital and the waiting room comfort and hygiene.
4. The patients want to change the hospital because there is significant difference between the satisfaction level on decision on changing the hospital and the enough seats in the waiting room
5. The patients want to change the hospital because there is significant difference between the satisfaction level on decision on changing the hospital and The comfort of seats available in the waiting room.
6. The patients don't want to change the hospital because there is no significant difference between the satisfaction level on decision on changing the hospital and hospital is having everything needed to provide medical care.

**Table 10. Analysis of Variance**

		Sum of Squares	df	Mean Square	F	Sig.
FAC1	Between Groups	90.004	4	22.501	11.202	.000
	Within Groups	592.566	295	2.009		
	Total	682.570	299			
FAC2	Between Groups	4.195	4	1.049	.505	.732
	Within Groups	613.202	295	2.079		
	Total	617.397	299			
FAC3	Between Groups	2.278	4	.569	.304	.875
	Within Groups	552.669	295	1.873		
	Total	554.947	299			
FAC4	Between Groups	1.190	4	.297	.148	.964
	Within Groups	591.247	295	2.004		
	Total	592.437	299			
FAC5	Between Groups	12.755	4	3.189	1.500	.202
	Within Groups	627.192	295	2.126		
	Total	639.947	299			
FAC6	Between Groups	219.056	4	54.764	46.866	.000
	Within Groups	344.714	295	1.169		
	Total	563.770	299			

This explains as a sample about the discrete nature of the factors addressed, not having much relationship and has to be attended separately. By addressing these factors the relative processes can be improved which in turn improve the quality of health care in the outpatient department. The satisfaction level of patients also will improve along with quality. Thus the measurement of patient satisfaction acts as an indicator for quality health care.

#### IV. CONCLUSION

The various studies express the utility of measure of patient satisfaction as an indicator of quality health care. The hospitals can use their resources to measure this periodically so that the factors changing due to

cultural turns in the medium scale hospitals market in the quality context as well as the continuous improvement and the direction of improvement can be identified and addressed properly.

#### REFERENCES

- [1] Mehmet Tolga Taner, Bülent Sezen, Jiju Antony, " An overview of six sigma applications in healthcare industry" International Journal of Health Care Quality Assurance Volume:20 Issue: 4 Page: 329 - 340 ISSN: 0952-6862, Emerald Group Publishing Limited, 2007.
- [2] Mayuri Duggirala, Chandrasekharan Rajendran, R.N. Anantharaman," Patient-perceived dimensions of total quality service in healthcare" Benchmarking: An International Journal Volume: 15 Issue: 5 Page:560 - 583 ISSN: 1463-5771 Emerald Group Publishing Limited, 2008.
- [3] Fitzpatrick R. Surveys of patient satisfaction. Important general considerations. British Medical Journal 1991a; 302:887-889.
- [4] Barry, Robert, A.C. Murcko and C.E. Brubaker, *The Six Sigma Book for Healthcare*, Health Administration Press, 2002.
- [5] S Grogan, M Conner, P Norman, D Willits and I Porter "Validation of a questionnaire measuring patient satisfaction with general practitioner services" Quality in Health Care 2000; 9: 210–215
- [6] Harris LE, Swindle RW, Mungai SM, *et al.* Measuring patient satisfaction for quality improvement. *Med Care* 1999; 37: 1207–13.
- [7] Woodward CA, Ostbye T, Craighead J, *et al.* Patient satisfaction as an indicator of quality care in independent health facilities: developing and assessing a tool to enhance public accountability. *Am J Med Qual* 2000; 15: 94–105.
- [8] Baker R. Development of a questionnaire to assess patients' satisfaction with consultations in general practice. *Br J Gen Pract* 1990; 40: 487–90.
- [9] Arpinelli F, Visona G, Recchia G. A new questionnaire to measure patient satisfaction with general practice: the Verona patient satisfaction questionnaire VPSQ. *Quality of Life Res* 1997; 6:7 –8.