

Study on a Patient-Oriented Approach to Build Patient Satisfaction in Tertiary Care Hospital

By

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MBA Hospital and Health Management*

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The IIHMR University, Jaipur

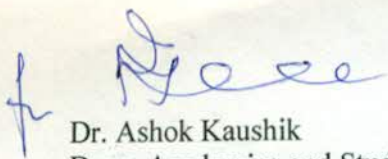
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TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr Nivedita Khanra** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone dissertation training at **Sakra World Hospital , Bangalore** from February 15th, 2016 to April 30th, 2016.

The Candidate has successfully carried out the study designated to her during dissertation training and her approach to the study has been sincere, scientific and analytical. This training is in fulfillment of the course requirements.

I wish her all success in all future endeavors.



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DATE: 30th April 2016

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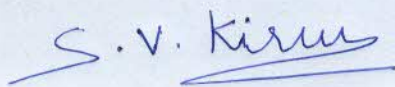
This is to certify that **Dr. Nivedita Khanra**, student of IIHMR University, Jaipur has successfully completed her internship at Sakra world hospital from **15th Feb 2016 To 30th April 2016**, Under supervision and guidance of Senior Manager – Patient Care Services

During her dissertation, she was found to be sincere , dedicated and hardworking. She has also shown a great passion towards learning

We wish her a successful career ahead

For **Takshasila Hospitals**

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **A Study on a Patient Oriented Approach to build Patient Satisfaction in a Tertiary Care Hospital** and submitted by **Dr. Nivedita Khanra** Enrollment No. **2014-2016 / 0184** under the supervision of **Dr. Goutam Sadhu** for award of Postgraduate Diploma in Hospital and Health/ Pharmaceutical / Rural Management of the University carried out during the period from **15/2/2016 to 30/4/2016** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Nivedita Khanra
Signature

Success of an individual is possible when a person is being supported and promoted by others.

Apart from the efforts of myself, the success of this study depends largely on the encouragement and guidelines of many others. I take this opportunity to express my gratitude to the people who have been instrumental in the successful completion of this study. The guidance and support received from all the members who contributed was vital for the success of this study. I am grateful for their constant support and help.

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Dr. Nivedita Khanra

TABLE OF CONTENTS

S.NO	CONTENTS	PAGE NO
1	BACKGROUND	9
2	RATIONALE	9
3	RESEARCH QUESTION	10
4	RESEARCH OBJECTIVES	10
5	LITERATURE REVIEW	17
6	METHODOLOGY	19
7	FINDINGS	39
8	CONCLUSIONS	40
9	REFERENCES	41

Figures

1	Kano model	12
2	Framework for integrating Servqual , Kano and QFD Model	17

Tables

1	Kano evaluation model	13
2	Expectation score distribution	19
3	Perception score distribution	21
4	Gap score for service attributes	23
5	Individual care and attention are not taken care by the following staff	25

6	Staff are not polite & courteous	25
7	delay in following services	25
8	lack of Cleanliness in the following services	26
9	defects in the Food& beverage services	26
10	Availability and condition of the following facility	27
11	kano categorization	27
12	kano category and its gap score of the following service attributes	30
13	Importance level of service attributes	33
14	Adjusted Importance score of what category of QFD Model	33
15	Importance score of the service attributes and their relative ranking	36
16	importance score of HOW's and their Relative Ranking	38

ABSTRACT

Patient oriented service is the core value of Healthcare business. Today Hospitals should not only provide medical care but also need to pay attention towards the issue of increasing patient satisfaction. The objectives of the study are to identify the service attributes and their gaps in a Tertiary Care Hospital, to categorize the service attributes of the hospital, to prioritize patients' requirement and action plans to close the service gaps. This study was a Descriptive Analytical and a Cross sectional survey. A Close ended structured questionnaire was distributed and in-depth Interviews were performed among 420 inpatient in Sakra World Multi Specialty Hospital, Bangalore. The results from the first SERVQUAL survey indicate that 20 out of 24 service attributes have negative gap scores. Thus, it is fair to say that service gaps exist in services. Through the Kano questionnaire survey, the 24 service attributes were grouped under the four Kano categories: Attractive, One-dimensional, Must-be, and Indifferent. Only 5 attribute fell into the Indifferent category, indicating that the other 19 attributes' performances influence patient satisfaction levels. In addition, the customer satisfaction coefficients were calculated to provide deeper insight into the attributes' influences on patient satisfaction. To enable the hospital to relocate resources effectively and efficiently for corrective actions, 12 factors were selected .An importance performance grid was developed to prioritize the service attributes and action plans . Therefore, the managers should be able to think from patient's point of view i.e. To listen to the voice of customer (VOC) in order to remain competitive in business , maintain long-term relationships with their customers and hence to grow.

EXECUTIVE SUMMARY

Background: Patient oriented service is the core value of Healthcare business. Today Hospitals should not only provide medical care but also need to pay attention towards the issue of increasing patient satisfaction. This study measure service quality from the patients' point of view and identify service performance that patients find unsatisfactory. In addition, categorizing these service attributes enables us to gain profound insight into the relationship between service performance and patient satisfaction. Quality function deployment can translate patient requirements (the gaps identified) into corresponding solutions, translate patients' demands into design targets to satisfy them, basis for improvement planning and prioritization of action plans as per the patients' voice. Therefore, the technique of integrating SERVQUAL, Kano and Quality function deployment enables us to gain broader insights into patient satisfaction and service quality improvement.

Objectives: The objectives of the study are to identify the service attributes and their gaps in a Tertiary Care Hospital, to categorize the service attributes of the hospital, to prioritize patients' requirement and action plans to close the service gaps.

Methodology: This study was a Descriptive Analytical and a Cross sectional survey. A Close ended structured questionnaire was distributed and in-depth Interviews were performed among 420 inpatient in Sakra World Multi Specialty Hospital, Bangalore.

Result: Servqual model showed the negative Gap Scores for the Service Attributes, Food & beverages (-4.00), Delay in services (-3.99), Performance of bedside nurse call system in ward (-3.88), Cleanliness in the hospital (-3.7). All the service attributes were categorized under Kano category. QFD model showed Importance score of the service attributes and their relative ranking. Treatment explained to the patient very clearly is ranked first, followed by Performance of pest control in hospital, Availability and condition of the luxury facilities, Food & beverages, Delay in services. It also showed the importance score of HOW's and their Relative Ranking. Vigorous monitoring is ranked first, followed by Training and Standardization in process.

Conclusions: Quality Function Deployment, Kano model and Servqual model provides a practical approach for hospitals to become more quality oriented. The results from the first SERVQUAL survey indicate that 20 out of 24 service attributes have negative gap scores. Thus, it is fair to say that service gaps exist in services.

Through the Kano questionnaire survey, the 24 service attributes were grouped under the four Kano categories: Attractive, One-dimensional, Must-be, and Indifferent. Only 5 attribute fell into the Indifferent category, indicating that the other 19 attributes' performances influence patient satisfaction levels. Thus, the second research objective is achieved

In addition, the customer satisfaction coefficients were calculated to provide deeper insight into the attributes' influences on patient satisfaction.

To enable the hospital to relocate resources effectively and efficiently for corrective actions, 12 factors were selected .An importance performance grid was developed to prioritize the service attributes and action plans .The power of the proposed model came from the detailed discussion with patients about their requirements and considerations of how the hospital can meet the patients' requirements most effectively. Therefore, the managers should be able to think from patient's point of view i.e. To listen to the voice of customer (VOC) in order to remain competitive in business , maintain long-term relationships with their customers and hence to grow.

Keywords: Service Quality, Patient Satisfaction, Servqual Model, Kano Model, Quality Function Deployment

A STUDY ON A PATIENT-ORIENTED APPROACH TO
BUILD PATIENT SATISFACTION IN A TERTIARY CARE
HOSPITAL.

BACKGROUND

Patient oriented service is the core value of Healthcare business .Today hospitals not only provide medical care but also need to pay attention towards the issue of increasing patient satisfaction. It is very important for the hospitals to know how to measure service attributes from patients' perspective in order to better understand their needs and hence satisfy. Therefore, the managers should be able to think from patient's point of view i.e. to listen to the voice of customer (VOC) in order to remain competitive in business and hence to grow. So, by continuously and dynamically adopting methodologies corresponding to the patients' requirements, the organizations will become capable to develop and maintain long-term relationships with their customers and generate benefits for all stakeholders. Patient satisfaction is achieved by identifying patient requirements including both hidden and spoken needs. To identify these patient requirements three approaches can be used, i.e. Servqual model, Kano model and Quality function deployment

1. RATIONALE

This study measure service quality from the patients' point of view and identify service performance that patients find unsatisfactory. In addition, categorizing these service attributes enables us to gain profound insight into the relationship between service performance and customer satisfaction . Quality function deployment can translate customer requirements (the gaps identified) into corresponding solutions, improve the communication of patients' wants throughout the organization. Quality function deployment could translate patients' demands into design targets to satisfy them.It provides a basis for improvement planning and prioritization of action plans as per the customers' voice. It helps the cross-functional team to make the key tradeoffs between the customers' needs and the technical requirements so as to develop a high quality service. Therefore, the technique of integrating SERVQUAL, Kano and QFD enables us to gain broader insights into customer satisfaction and service quality improvement

2. RESEARCH QUESTION

- What are the service attributes and their gaps in a Tertiary Care Hospital?
- What are the categorizations of hospital service attributes?
- How hospitals can prioritize patients' requirement and action plans to close the service gaps?

3. OBJECTIVES

- To Identify the service attributes and their gaps in a Tertiary Care Hospital
- To Categorize the service attributes of the hospital
- To prioritize patients' requirement and action plans to close the service gaps.

4. REVIEW OF LITERATURE

- Quality Function Deployment began thirty years ago in Japan that was created based on giving products or services. It vehemently focuses the customer needs or desires. Quality Function Deployment became instantly popular due to its practicality but overall effectiveness in business in the 1960's when it was created. In 1983, many companies in North America discovered this approach and are currently using it with engineering to optimize their products and services and design the development process of Quality Function Deployment itself. Since then, Quality Function Deployment has not only improved quality within businesses but also the U.S healthcare industry and University level Education system.
- Measurement of Service Quality
Parsuraman, Zeithaml and Berry (1988) defined service quality as “the degree of discrepancy between customer's normative expectations for the service and their perceptions of the service performance.” Service quality is described in five universal dimensions of service quality with the acronym

RATER:

Reliability (the ability to provide what was promised, dependably and accurately).

Assurance (the knowledge and courtesy of employees, and their ability to convey trust and confidence).

Tangibles (the physical facilities and equipment, and their appearance of personnel).

Empathy (the degree of caring and individual attention provided to customers).

Responsiveness (the willingness to help customers and provide prompt service).

- Attributes of Health Care Quality

According to Donabedian (1980), quality is simply an attribute that the technical and interpersonal aspects of medical care manifest in varying degrees.

He provided criteria for what constitutes "good care", using the frame structure (related to physical environment and facilities), process (related to interaction with service personnel) and outcome (the result of the interaction).

Lytle and Mokwa (1992) who maintain that service quality depends on two variables: expected service and perceived service, and further state that "A health care service product is a 'bundle' of tangible and intangible benefits that satisfy patients' needs and wants". Steffen, Nystrom and O'Connor (1996) linked perceived service quality on the part of consumers to the level of employee satisfaction with work roles. They maintain that factors such as job design, role clarity, and autonomy affect employee attitudes, which in turn affect patient experience in the institution.

5. CONCEPTUAL FRAMEWORK

6.1 Service quality: Service Quality is the difference between predicted or expected service (customer expectations) and perceived service (customer perceptions). Service quality is the customers' perception of how well a service meets or exceeds their expectations, and it is judged by the customers, not organizations.

Patient satisfaction: Patient satisfaction is the degree of congruency between a patient's expectations of ideal care and his/her perception of the real care received.

6.2 SERVQUAL MODEL

It is the instrument used for measuring service quality under the Gap model.

Expectations has been defined as a person's belief regarding anticipated performance

Perceptions has been defined as a person's formed opinion of the experienced service

Based on Gap 5, it is as defined service quality as a function of the differences between patients' expectations for the service performance before the service encounter and patients' perceptions of the service they actually received, namely, Perception-minus-Expectation

6.3 KANO MODEL

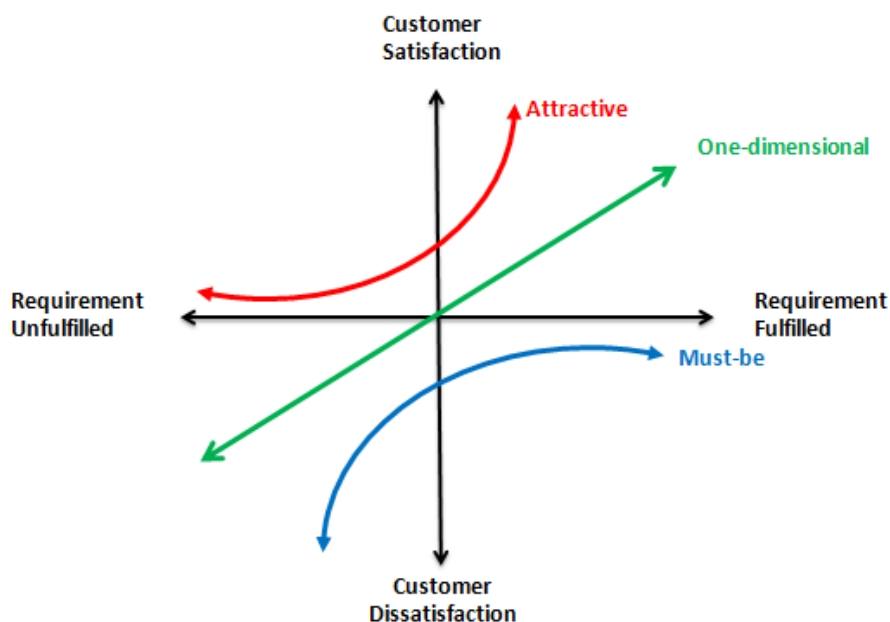


Figure 1 shows : Kano model

The horizontal axis of the diagram indicates the extent to which a service aspect fulfills patients requirements and the vertical axis indicates the extent to which patients are satisfied with the service.

In Kano Model, Responses to all questions in both functional and dysfunctional questionnaires were paired to categorize service attributes into the six categories

- Must-be Quality (M)- -In this category, service attributes must be provided to customers. They are of “taken for granted quality”, their presence does not have a significant positive impact on customer satisfaction, but their absence causes dissatisfaction
- One-dimensional Quality (O)- In this category, the presence of the service attributes results in customer satisfaction. These services’ quality is linearly related to customer satisfaction: the higher the quality level, the higher the degree of satisfaction and vice versa
- Attractive Quality (A)- In this category, the presence of the service attributes excites the customers and results in satisfaction, but their absence does not cause customer dissatisfaction because customers do not usually have experience with them
- Indifferent Quality (I)- In this category, the service attributes’ state of fulfillment does not influence customers’ degree of satisfaction. In other words, customers are indifferent towards them.
- Reverse Quality (R)- In this category, the absence of these service attributes results in customer satisfaction and vice versa, just contrary to one-dimensional quality attributes.
- Questionable (Q)-It signify that question was phrased incorrectly or that patient surveyed misunderstood the question.

Data Analysis of Kano Model

The attributes were analyzed through frequency analysis.

Table 1 shows: Kano Evaluation Table

		Response to dysfunctional question				
		1. Like	2. Must be	3. Neutral	4. Live with	5. Dislike
Response to functional	1. Like	Q	A	A	A	O
	2. Must be	R	I	I	I	M

question	3. Neutral	R	I	I	I	M
	4. Live with	R	I	I	I	M
	5. Dislike	R	R	R	R	Q

A = Attractive attribute

O = One dimensional attribute

M = Must be attribute

I = Indifferent attribute

Source: Tan and Pawitra (2001)

6.4 Quality function deployment model

“QFD is a system with the aim of translating and planning the “voice of the customer” into the quality characteristics of products, processes and services in order to reach customer satisfaction”. QFD is not only a quality tool, but also an important planning tool. It allows the consideration of the "voice of the customer" along the service development path to market entry. In order to develop a service it is necessary to “translate” these fuzzy requirements into quantitative service design requirements; QFD makes this translation possible.

QFD Advantages

1. The biggest advantage of QFD is that it promotes the development of services in a proactive way.
 2. QFD application allows reducing costs and time
 3. QFD's is oriented to the “voice of the customer” and not to the “thoughts of the developer”.
- With the focus on the consumer, all decisions made during the service design are targeted at the customer.

THE HOUSE OF QUALITY

The House of Quality (HOQ) is the most important and frequently used matrix; the name comes from its house shape. The components of HOQ are described as follows

1. The exterior wall of the house is the WHATs: a list of customer requirements
2. The ceiling of the house is the HOWs: a list of design/ technical requirements
3. The interior or living room of the house contains the relationship between the customer and technical attributes, called as the Relationship Matrix.

The degrees of relationships are usually presented by symbols, and in quantitative analysis the symbols are replaced by numbers,

A dark circle ● = strong relationship = 9

An empty circle ○ = medium relationship = 3

A triangle ▽ = weak relationship = 1

4. The roof of the house holds the interrelationship among technical attributes also known as Correlation Matrix. It represents the Trade-offs between similar and/or conflicting technical attributes

- Symbols are used to describe the strength of the interrelationships

A dark circle ● = strong positive relationship

An empty circle ○ = positive relationship

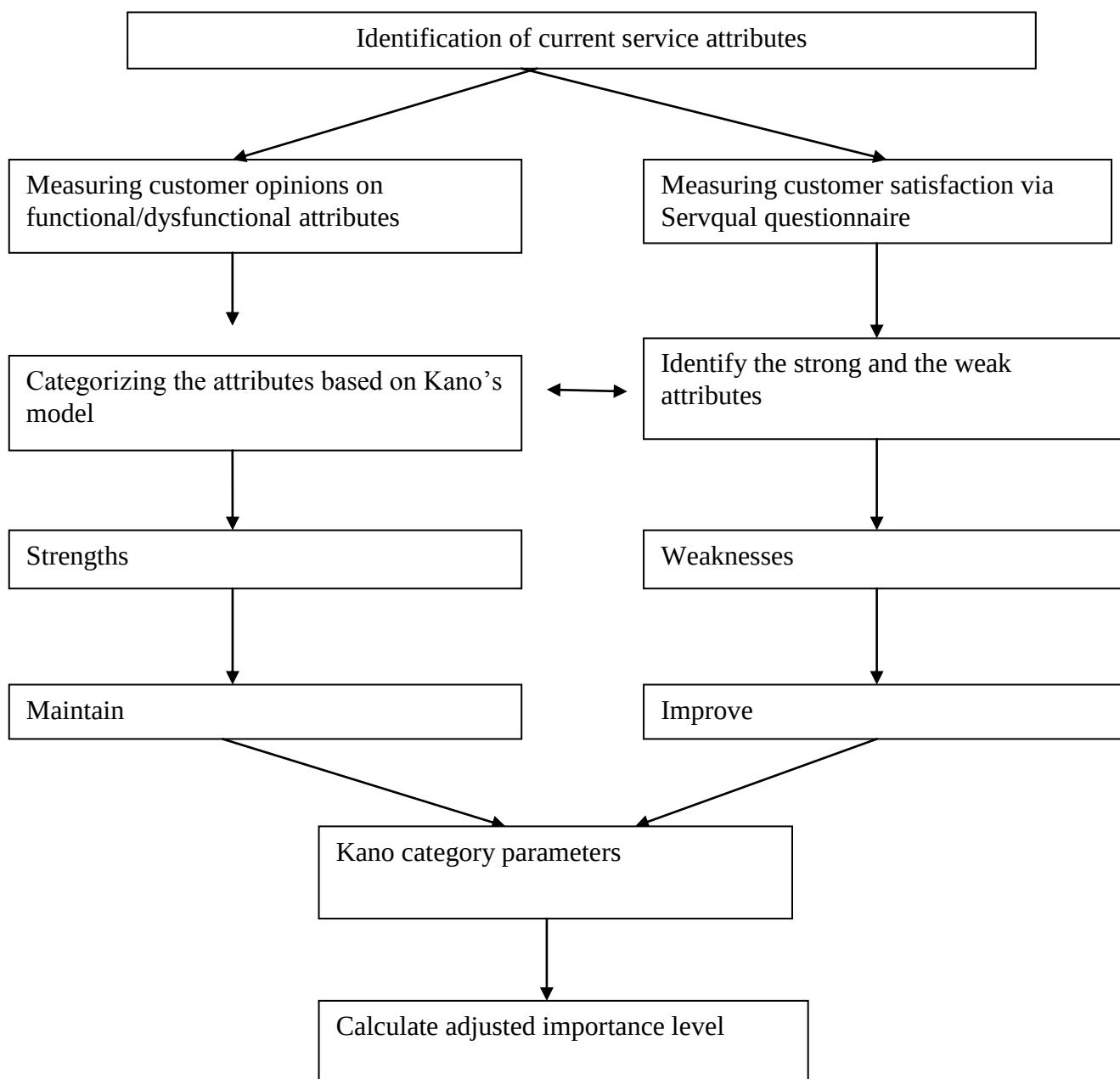
A single X = negative relationship

A double XX = strong negative relationship

6.5 INTEGRATION OF SERVQUAL, the Kano model and QFD for quality improvement and building patient satisfaction

- Kano Model- There is an underlying assumption in SERVQUAL for prioritizing service attributes: the larger the negative gap score, the higher the priority of the improvement ratio.
- Kano proposed a non-linear and asymmetric relationship between service quality and customer satisfaction. Introducing Kano's service attribute categories into SERVQUAL and integrating them together can overcome this linearity limitation

- The weights for each service attribute assigned by the Kano model can then be added to the gap score obtained from SERVQUAL evaluation. Finally, the most significant item can be identified and prioritized for improvement. This integration also improves the Kano model's utility.
- The Kano model does not evaluate service performance. By integrating it into SERVQUAL, a complete picture of service attributes' performance and their relationship to customer satisfaction can be obtained.



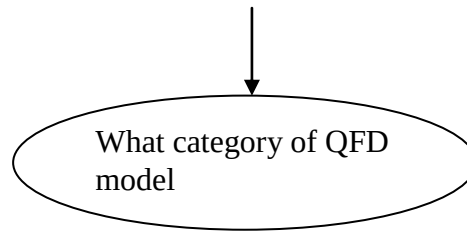


Figure 2- shows Framework for integrating SERVQUAL , Kano model and QFD model

The three benefits for this Servqual , Kano and QFD integrated approach are as follows :

- (1) It provides a basis for improvement planning.
- (2) There is a prioritization of action plans as per the customers' voice.
- (3) There is enhanced documentation, communication and teamwork.

6. METHODOLOGY-

7.1 STUDY DESIGN

Descriptive and a Cross sectional survey

7.2 STUDY AREA

Sakra World Multi Specialty Hospital, Bangalore

7.3 TARGET POPULATION

Inpatients

7.4 SAMPLE SIZE

A total of 420 patients were sampled for the study

(6 Wards X 2 Patients X 35working Days=420)

(Excluding Suite Rooms)

7.5 STUDY DURATION

15th Feb. to 30th April

7.6 SAMPLING TECHNIQUE

Simple random sampling technique

7.7 TOOLS AND TECHNIQUES-

Quantitative data collection technique

	TOOLS	TECHNIQUES	RESPONDANTS
SERVQUAL Model	Close ended structured questionnaire guidelines	structured Questionnaire	Inpatients
Kano model	Close ended structured questionnaire guidelines (Functional & Dysfunctional)	structured Questionnaire	Inpatients
QFD Model	In Depth Interviews guidelines	In Depth Interviews	Inpatients and staffs

DATA ANALYSIS METHOD

Data collected from these respondents will be analyzed using Advance Excel and SPSS Software

7. FINDINGS

a. Data Analysis for SERVQUAL Questionnaire Survey

We used the SERVQUAL 5 dimensions (Tangibles, Reliability, Responsiveness, Assurance and Empathy) which are subdivided into 24 statements

The SERVQUAL model is used to assess patients' expectations and perceptions regarding service quality in hospitals. Both expectations and perceptions are measured using a 6-point likert scale to rate their level of satisfaction (1- extremely poor and 6- extremely good), on which the higher numbers indicate higher level of expectation or perceptions.

Table 2-shows Mean Expectation Score Distribution

SERVICE ATTRIBUTES	EXPECTATION SCORE
Clarity of Signages (Easy To Spot)	5
Physical facility should be visually appealing	5
Condition of elevator & escalator	5
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	5
Adequacy of Facilities at the time of admission (e.g. hand rub , welcome kit, attender pass , visitor pass , toilet roll, wardrobe key, admission booklet ,tissue paper, Newspaper etc at the time of admission	4
Food & beverages(quality, missing of items, planned food not served, missing of meals, temperature of food served)	6

Treatment and care provided by doctor	6
Treatment explained to the patient very clearly	6
Individual care and attention given by the staff members during service encounter.	6
Performance of bedside nurse call system in ward	6
Delay in services (Admission, treatment, doctor visit, Scheduled Surgery, Laboratory, radiology, Diagnostic, housekeeping services. Food & beverage service, pharmacy, Discharge, Regular Follow ups)	6
Cleanliness in the hospital (washroom , floor , public area, tray clearance, dustbin disposal)	6
Availability & condition of facility inside the washroom such as (mug, bucket ,flush)	4
Performance of pest control in hospital	5
Patient dress / bed sheet /blanket/ pillow is (are) given to the patients	4
Appropriate size of patient dress given	4
Changing of patient dress / bed sheet regularly	4
Availability and condition of facilities (e.g.-door, TV , AC ,Phone , fan regulator, Call Bell, TV remote, Ac remote, Charging point,) in ward etc	4
Provision of privacy protection in ward (curtains, blinds, knocking of door before entering)	4
Ambience in Room/ corridor (e.g. noisy/ quit)	5
Performance of lighting system in ward	4
Performance of ventilation system in ward(e.g.- odor)	4

Tidiness in staff appearance	4
Staff to be polite and courteous during service encounter	5

Table 3 shows Mean Perception Score Distribution

SERVICE ATTRIBUTES	PERCEPTION SCORE
Clarity of Signages (Easy To Spot)	4
Physical facility should be visually appealing	5
Condition of elevator & escalator	6
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	5
Adequacy of Facilities at the time of admission (e.g. Hand rub, welcome kit, attender pass, visitor pass, toilet roll, wardrobe key, admission booklet, tissue paper, Newspaper etc at the time of admission.	3
Food & beverages (quality, missing of items, planned food not served, missing of meals, temperature of food served).	3
Treatment and care provided by doctor	4
Treatment explained to the patient very clearly	3
Individual care and attention given by the staff members during service encounter.	4
Performance of bedside nurse calls system in ward.	2

Delay in services (Admission, treatment, doctor visit, Scheduled Surgery, Laboratory, radiology, Diagnostic, housekeeping services. Food & beverage service, pharmacy, Discharge, Regular Follow ups).	1
Cleanliness in the hospital (washroom, floor, public area, tray clearance, dustbin disposal).	3
Availability & condition of facility inside the washroom such as (mug, bucket ,flush)	3
Performance of pest control in hospital	3
Patient dress / bed sheet /blanket/ pillow is (are) given to the patients	3
Appropriate size of patient dress given	3
Changing of patient dress / bed sheet regularly	3
Availability and condition of facilities (e.g.-door, TV , AC ,Phone , fan regulator, Call Bell, TV remote, Ac remote, Charging point,) in ward etc	1
Provision of privacy protection in ward (curtains, blinds, knocking of door before entering)	3
Ambience in Room/ corridor (e.g. noisy/ quit)	3
Performance of lighting system in ward	4
Performance of ventilation system in ward(e.g.- odor)	4
Tidiness in staff appearance	4
Staff to be polite and courteous during service encounter	3

Table 4- Gap Scores for the Service Attributes

SERVICE ATTRIBUTES	GAP SCORE (P-E)
Condition of elevator & escalator	0.68
Physical facility should be visually appealing	0.27
Tidiness in staff appearance	.22
Performance of lighting system in ward	0.05
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	-0.22
Performance of ventilation system in ward(e.g.- odor)	-0.3
Clarity of signages (easy to spot)	-0.89
Appropriate size of patient dress given	-1.11
Changing of patient dress / bed sheet regularly	-1.33
Provision of privacy protection in ward (curtains, blinds, knocking of door before entering)	-1.36
Adequacy of facilities at the time of admission (e.g. hand rub , welcome kit, attender pass , visitor pass , toilet roll, wardrobe key, admission booklet ,tissue paper, newspaper etc at the time of admission	-1.51
Treatment and care provided by doctor	-1.52
Availability & condition of facility inside the washroom such as (mug, bucket ,flush)	-1.56

Patient dress / bed sheet /blanket/ pillow is (are) given to the patients	-1.77
Ambience in room/ corridor (e.g. noisy/ quit)	-1.78
Staff to be polite and courteous during service encounter	-2.1
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	-2.2
Individual care and attention given by the staff members during service encounter.	-2.3
Performance of pest control in hospital	-2.4
Availability and condition of facilities (example -door, TV , ac ,phone , fan regulator, call bell, TV remote, ac remote, charging point,) in ward etc	-2.6
Treatment explained to the patient very clearly	-2.9
Cleanliness in the hospital (washroom , floor , public area, tray clearance, dustbin disposal)	-3.7
Performance of bedside nurse call system in ward	-3.88
Delay in services (admission, treatment, doctor visit, scheduled surgery, laboratory, radiology, diagnostic, housekeeping services. Food &beverage service, pharmacy, discharge, regular follow ups)	-3.9
Food & beverages(quality, missing of items, planned food not served, missing of meals, temperature of food served)	-4.00

Table 5 -shows Individual care and attention are not taken care by the following staff

Nurses	70%
Gda	20%
Doctor	10%

Table 6 -shows the following Staff are not polite & courteous

Nurses	68%
Security	15%
Steward/ F&B	17%

Table 7 -shows delay in following services

F &b	27%
Housekeeping	19%
Discharge	11%
Surgery	10%
Admission	9%
Doctor visit	7%
Treatment	7%
Pharmacy	4.7%
Insurance	2.5%

Diagnostics	2.25%
Laboratory	1.7%

Table 8 -shows lack of Cleanliness in the following services

Washroom	42%
Floor	20%
Tray clearance	12.2%
Dustbin disposal	10.7%
Pest control	9.7%
Public area	4.8%

Table 9 -shows the following defects in the Food& Beverage Services

Quality	42%
Planned diet not served	28%
Missing of items	14%
Temperature	11%
Missing of meals	6%

Table 10 -shows Availability and condition of the Luxury facilities

Call bell	21%
Tv remote	21%
Tv	20%
Ac	11%
Fan regulator	8%
Door	6.3%
Ac remote	6.5%
Charging point	3.6%
Phone	1.4%

9.2 Data Analysis for Kano Questionnaire Survey

Table11 -shows the results from Kano categorization

SERVICE ATTRIBUTES	KANO CATEGORY
Clarity of signages (easy to spot)	Indifferent
Physical facility should be visually appealing	Attractive
Condition of elevator & escalator	One

	dimensional
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	Attractive
Adequacy of facilities at the time of admission (e.g. hand rub , welcome kit, attender pass , visitor pass , toilet roll, wardrobe key, admission booklet ,tissue paper, newspaper etc at the time of admission	Indifferent
Food & beverages(quality, missing of items, planned food not served, missing of meals, temperature of food served)	Must be
Treatment and care provided by doctor	Must be
Treatment explained to the patient very clearly	One dimensional
Individual care and attention given by the staff members during service encounter.	Must be
Performance of bedside nurse call system in ward	Must be
Delay in services (admission, treatment, doctor visit, scheduled surgery, laboratory, radiology, diagnostic, housekeeping services. Food &beverage service, pharmacy, discharge, regular follow ups)	Must be
Cleanliness in the hospital (washroom , floor , public area, tray clearance, dustbin disposal)	Must be

Availability & condition of facility inside the washroom such as (mug, bucket ,flush)	Indifferent
Performance of pest control in hospital	One dimensional
patient dress / bed sheet /blanket/ pillow is (are) given to the patients	One dimensional
Appropriate size of patient dress given	Indifferent
Changing of patient dress / bed sheet regularly	One dimensional
Availability and condition of facilities (e.g.-door, TV , ac ,phone , fan regulator, call bell, TV remote, ac remote, charging point,) in ward etc	One dimensional
Provision of privacy protection in ward (curtains, blinds, knocking of door before entering)	One dimensional
Ambience in room/ corridor (e.g. noisy/ quit)	One dimensional
Performance of lighting system in ward	Attractive
Performance of ventilation system in ward(e.g.- odor)	Indifferent

Tidiness in staff appearance	Attractive
Staff to be polite and courteous during service encounter	One dimensional

- At this stage, service gaps and service attributes' categories were identified, allowing attention to focus on the attributes with a negative gap score and at the same time classified under "A", "O" and "M".

Table 12 shows – Kano category and its gap score of the following service attributes

SERVICE ATTRIBUTES	KANO CATEGORY	GAP SCORE
Clarity of Signages (Easy To Spot)	I	-0.89
Physical facility should be visually appealing	A	0.27
Condition of elevator & escalator	O	0.68
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	A	-0.22
Adequacy of Facilities at the time of admission (e.g. hand rub , welcome kit, attender pass , visitor pass , toilet roll, wardrobe key, admission booklet ,tissue paper, Newspaper etc at the time of admission	I	-1.51
Food & beverages(quality, missing of items, planned food not served, missing of meals, temperature of food served)	M	-4.00

Treatment and care provided by doctor	M	-1.52
Treatment explained to the patient very clearly	O	-2.9
Individual care and attention given by the staff members during service encounter.	M	-2.3
Performance of bedside nurse call system in ward	M	-3.88
Delay in services (Admission, treatment, doctor visit, Scheduled Surgery, Laboratory, radiology, Diagnostic, housekeeping services. Food & beverage service, pharmacy, Discharge, Regular Follow ups)	M	-3.9
Cleanliness in the hospital (washroom , floor , public area, tray clearance, dustbin disposal)	M	-3.7
Availability & condition of facility inside the washroom such as (mug, bucket ,flush)	I	-1.56
Performance of pest control in hospital	O	-2.4
Patient dress / bed sheet /blanket/ pillow is (are) given to the patients	O	-1.77
Appropriate size of patient dress given	I	-1.11
Changing of patient dress / bed sheet regularly	O	-1.33

Availability and condition of facilities (e.g.-door, TV , AC ,Phone , fan regulator, Call bell, TV remote, Ac remote, Charging point,) in ward etc	O	-2.6
Provision of privacy protection in ward (curtains, blinds, knocking of door before entering)	O	-1.35
Ambience in Room/ corridor (e.g. noisy/ quit)	O	-1.78
Performance of lighting system in ward	A	0.05
Performance of ventilation system in ward(e.g.- odor)	I	-0.3
Tidiness in staff appearance	A	0.22
Staff to be polite and courteous during service encounter	O	-2.1

9.3 Data Analysis of QFD Questionnaire survey

Though following have negative gap score but are not included in what category of QFD Model as they belong to indifferent Kano category

- Clarity of Signages
- Adequacy of Facilities at the time of admission
- Availability & condition of facility inside the washroom
- Appropriate size of patient dress given
- Performance of ventilation system in ward

Table 13 shows- Importance level of service attributes

Total expectation score	Importance level	Score
2001-2400	Extremely important	6
1601-2000	Very important	5
1201-1600	important	4
801-1200	Quite important	3
401-800	Less important	2
1-400	Not important	1

Table 14 shows- Adjusted Importance score of what category of QFD Model

Service attributes	Absolute Gap score (a)	Importance score (b)	Customer satisfaction score $c=a*b$	Kano score (d)	Adjusted importance score of what (e)= $c*d$
Physical facility should be visually appealing	0.27	4	1.08	4	4.32
Condition of elevator & escalator	0.68	5	3.4	2	6.8
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	0.22	5	1.1	4	4.4
Food & beverages(quality, missing of items, planned food not served, missing	4.00	6	24	1	24

of meals, temperature of food served)					
Treatment and care provided by doctor	1.52	6	9.12	1	9.12
Treatment explained to the patient very clearly	2.9	6	17.4	2	34.8
Individual care and attention given by the staff members during service encounter.	2.3	6	13.8	1	13.8
Performance of bedside nurse call system in ward	3.88	6	23.28	1	23.28
Delay in services (Admission, treatment, doctor visit, Scheduled Surgery, Laboratory, radiology, Diagnostic, housekeeping services. Food & beverage service, pharmacy, Discharge, Regular Follow ups)	3.9	6	23.4	1	23.4
Cleanliness in the hospital (washroom , floor , public area, tray clearance, dustbin disposal)	3.7	6	22.2	1	22.2
Performance of pest control in hospital	2.4	6	14.4	2	28.8
Patient dress / bed sheet /blanket/	1.77	5	8.85	2	17.7

pillow is (are) given to the patients					
Changing of patient dress / bed sheet regularly	1.33	5	6.65	2	13.3
Availability and condition of facilities (e.g.-door, TV , AC ,Phone , fan regulator, Call bell, TV remote, Ac remote, Charging point,) in ward etc	2.6	5	13	2	26
Provision of privacy protection in ward (curtains, blinds, knocking of door before entering)	1.35	5	6.8	2	13.6
Ambience in Room/ corridor (e.g. noisy/ quit)	1.78	5	8.9	2	17.8
Performance of lighting system in ward	0.05	4	0.2	4	0.8
Tidiness in staff appearance	0.22	4	0.88	4	3.52
Staff to be polite and courteous during service encounter	2.1	5	10.5	2	21

Table 15 shows-Importance score of the service attributes and their relative ranking

ATTRIBUTES	ADJUSTED IMPORTANCE SCORE OF WHAT	RANKING
Treatment explained to the patient very clearly	34.8	1
Performance of pest control in hospital	28.8	2
Availability and condition of facilities (e.g.-door, TV , ac ,phone , fan regulator, call bell, TV remote, ac remote, charging point,) in ward etc	26	3
Food & beverages(quality, missing of items, planned food not served, missing of meals, temperature of food served)	24	4
Delay in services (admission, treatment, doctor visit, scheduled surgery, laboratory, radiology, diagnostic, housekeeping services. Food &beverage service, pharmacy, discharge, regular follow ups)	23.4	5
Performance of bedside nurse call system in ward	23.28	6
Cleanliness in the hospital (washroom , floor , public area, tray clearance, dustbin disposal)	22.2	7
Staff to be polite and courteous during service encounter	21	8
Ambience in room/ corridor (e.g. noisy/ quit)	17.8	9

patient dress / bed sheet /blanket/ pillow is (are) given to the patients	17.7	10
Individual care and attention given by the staff members during service encounter.	13.8	11
Provision of privacy protection in ward (curtains, blinds, knocking of door before entering)	13.6	12
Changing of patient dress / bed sheet regularly	13.3	13
Treatment and care provided by doctor	9.12	14
Condition of elevator & escalator	6.8	15
Infrastructure in the ward(cot size , room small , location of room, location of plug point)	4.4	16
Physical facility should be visually appealing	4.32	17
Tidiness in staff appearance	3.52	18
Performance of lighting system in ward	0.8	19

Table 16 shows –The importance score of HOW's and their Relative Ranking

Factors	Importance score	Rank
Vigorous monitoring	1463.6	1
Training	845	2
Standardization	821.4	3
Coordination interdepartmental /intradepartmental	686.64	4
Effective communication	550.6	5
Sense of urgency	279.7	6
Technology	272.76	7
Staff available	271.98	8
Skilled manpower	208.8	9
Investment	167.04	10
Experienced staff	140.88	11
Transparency	82.2	12

10. CONCLUSIONS

- Quality Function Deployment, Kano model and Servqual model provides a practical approach for hospitals to become more quality oriented.
- The results from the first SERVQUAL survey indicate that 20 out of 24 service attributes have negative gap scores. Thus, it is fair to say that service gaps exist in services.
- Through the Kano questionnaire survey, the 24 service attributes were grouped under the four Kano categories: Attractive, One-dimensional, Must-be, and Indifferent. Only 5 attribute fell into the Indifferent category, indicating that the other 19 attributes' performances influence patient satisfaction levels. Thus, the second research objective is achieved
- In addition, the customer satisfaction coefficients were calculated to provide deeper insight into the attributes' influences on patient satisfaction.
- To enable the hospital to relocate resources effectively and efficiently for corrective actions, 12 factors were selected
- An importance performance grid was developed to prioritize the service attributes and action plans.
- The power of the proposed model came from the detailed discussion with patients about their requirements and considerations of how the hospital can meet the patients' requirements most effectively.
- Therefore, the managers should be able to think from patient's point of view i.e. To listen to the voice of customer (VOC) in order to remain competitive in business , maintain long-term relationships with their customers and hence to grow.

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