Chapter III: Formulation of Hypotheses, Methodology and Research Procedures

As seen from the previous chapter, there exists a gap in the literature available in the area of patient satisfaction, complexity and channel of service delivery. The aspect of patient satisfaction and channel of service delivery related to health care research has been obtained from literature and is used in the formulation of hypotheses. The aspect of complexity and its effect on patient satisfaction has been culled out through a study using the critical incident technique across 40 respondents in the remote health care setting.

**Critical Incident Technique (CIT)**

In CIT customers provide verbatim stories about satisfying and dissatisfying service encounters they have experienced. Studies using critical incident technique are appropriate to address many different research objectives. Critical incidents are powerful and vivid in eliciting customer requirements, particularly when the research is focused on behavioral dimensions at the transaction level. (Parasuraman et al, 1990); (Zeithamal et al, 2000)

"The principal strength of the CIT is that the customer perspective is used as a basis for identifying detailed information about satisfaction/dissatisfaction (Ruyter and Scholl, 1994). Critical incidents are defined by Bitner et al (Bitner et al, 1990) as “specific interactions between customers and service firm employees that are specially satisfying or specially dissatisfying.” In their research they have used only those incidents which customers found memorable because they were particularly satisfying or dissatisfying, as examining such memorable critical incidents was likely to afford insight into the
fundamental factors leading to customers dissatisfactory/satisfactory evaluations. By the
same logic the CIT method can be used successfully to identify the various underlying
factors that affect patient satisfaction/dissatisfaction" (Salgaonkar, 2006)

"The CIT is adapted by (Bitner et al, 1990) in the marketing context to identify the sources
of both satisfactory and dissatisfactory service encounters from the customer’s point of
view. Service encounter is defined as “the dyadic interaction between a customer and
service provider” (Surprenant and Solomon, 1987). This definition focuses on the
interpersonal element in the service provider-customer interaction. Similarly (Shostack,
1985) defines the service encounter somewhat more broadly as “ a period of time during
which a consumer directly interacts with a service.” This definition encompasses all aspects
of the service firm with which the consumer may interact, including its personnel, its
physical facilities and other visible elements”(Salgaonkar, 2006).

"This thesis adopts the definition of “critical incident” and the four criteria, out of which
an incident is required to meet at least one to become eligible for the study, as laid down by
Bitner et al. (Bitner et al, 1990) The four critical incident criteria are; (1) involving
customer – employee interaction, (2) being very satisfying or dissatisfying from the
customer’s point of view, (3) being a discrete episode, and (4) having sufficient detail to be
visualised by the interviewer”(Salgaonkar, 2006).
Unstructured interviews with 40 patients were conducted at remote health care centres. An open-ended questionnaire was employed to collect the data from the patient respondents. The patients were also asked to narrate a critical incident that occurred during the service delivery, which according to them has affected their opinion about the doctor.

"The following questions were asked to all respondents in order to get critical incidents and answers were recorded. These questions are based on the framework of questions used by (Bitner et al, 1990), suitably modified to suit the subject under research. One new question has also been added"(Salgaonkar, 2006).

- "Think of a time/incident when, as a patient, you had a particularly satisfying/dissatisfying interaction with the doctor that has affected your opinion about the doctor.
- When did the incident happen?
- What specific circumstances led up to this situation?
- Exactly what did the doctor say or do?
- What resulted in making you feel that the interaction was satisfying/dissatisfying?
- How has it affected your opinion about the doctor"? (Salgaonkar, 2006)

"By providing verbatim stories about satisfying and dissatisfying service encounters they have experienced, customers reveal a great deal about what they desire in service encounters. The real benefit in using the critical incident technique is to identify customer requirements for individual service encounters"(Salgaonkar, 2006).
Out of the 40 interviews that were conducted, samples of 13 incidents that are representative of the variety of responses are given below.

Sample Incidents

1] I was suffering from severe chest pain, and was desperate for a doctor to check me, but I had no option but to approach the telemedicine centre, and get prescription from a doctor sitting far away from the clinic. The medicines he prescribed did benefit me in the long run, but it did not give me the immediate relief provided by a doctor when he personally examines you.

2] I am suffering from heart problems for the past one year, I did go to the city initially for treatment, but the cost of transportation was draining out the family income hence I have no choice but to frequent a telemedicine centre for my medical follow up. However I am not very comfortable with the doctor prescribing the medicines without even touching me. How can a doctor without even touching me know what is my condition and prescribe the appropriate medicines? I mean there is nothing like the personal touch of a doctor.

3] I am suffering from high blood pressure, with wide fluctuations in my blood pressure at times. I take around five tablets for controlling my pressure daily. Recently my pressure shot up again, causing me great uneasiness and inconvenience. On the suggestion of my neighbour, I went to seek medical help from the telemedicine centre. The doctor prescribed to me some additional medicines, which I was very apprehensive about. Although the tablets did help to control my blood pressure, I still do have fluctuations in the BP. I would
have preferred if the doctor had checked me thoroughly and then given me the prescription which he thought best.

4] I am suffering from diabetes for the past five years. Recently I developed a wound on my leg, which was not healing. I visited many local doctors and tried different local remedies but it only ended up being worse. Yesterday I got fever and so today I went to the telemedicine centre, as I heard that the doctor is very good. But this is something very new for me. How can a patient like me be treated by a doctor who has not even seen my wound?

5] I had some chest pain, at first I ignored it, but as my father had suffered a severe heart attack, my wife insisted that I should visit this centre. This is my first visit to the centre and the doctor has asked me to conduct quite a few tests, which will cost me quite a bit. I hope it will be of use to me, and give me relief from my condition, infact I am thinking of going to the city to be checked by a doctor properly when my son comes back next month.

6] I do not have any faith in this doctor. He might be highly qualified as the people say he is, but tell me how can a doctor just look at you, ask you some questions and then prescribe the medicines that too when you are suffering from a critical disease? This is the first time I have seen a medical examination like this one. But what can I do, I am a poor man and I cannot go every month to the city to be checked.

7] When I heard a cardiologist would be coming to this clinic, I was delighted as my wife was forcing me to take a trip to the city to be checked. I thought that this would save me the
trouble and cost of transportation involved. But when I went to the centre, I was taken by
surprise by this doctor sitting in some other state, as I was told; asking me my symptoms
and history. Anyway, I will see how things get along. It would have been better if the
doctor was here in person.

8] This is the third time I have come to this telemedicine centre. Everytime the doctor has
prescribed me certain medicines I have got temporary relief from the severe migraines that
I suffer from. However I still do get these terrible headaches and the uneasiness that
accompanies it. I often wonder, that if the doctor without checking me can provide
temporary relief to me, May be if he had to personally check me I would be permanently
cured from these terrible migraines.

9] Yes, the medicines prescribed by the doctor have definitely helped me. I really do not
mind if the doctor is sitting far away as long as he takes the time to listen to my problems
and is qualified to detect my illness. I have been suffering from terrible pains in my knees I
approached almost every local doctor and tried every local medicine but it did not give me
any relief. It was so bad that I felt I would never be able to walk again. Out of desperation
as a last resort I went to this centre. When I told the doctor my symptoms, he immediately
told me my problem and stated that I needed to use some knee support after looking at my
X-ray. Today, exactly after one month I can walk decently and the doctor has told me it
will still improve further.
10] When I went to the centre I was feeling dizzy and getting hot flashes. I just cannot explain how horrible I was feeling. The doctor asked my wife some questions and found that my pressure was very high. He told me that I am suffering from high blood pressure and that I will have to take the medicines for life. He also told me never to miss the tablets or to stop them abruptly without his permission. Today I am much better and the doctor has even told me that he may lessen my tablets if my pressure remains under control.

11] I hope that the doctor could spend more time with me explaining my condition and calming my fears. I mean I get sleepless nights wondering if the doctor is giving me the right medicines, as I am told I am suffering from high sugar levels in my blood. I am following exactly what the doctor has asked me to do. But I still keep unwell and suffer from anxiety about my health.

12] I do not feel I am visiting a doctor's clinic. There is no such thing like the usual check up, which we usually find in a normal clinic. I am so used to having the doctor being personally there doing everything. But I am getting used to this also, and may be after sometime I will get used to these types of clinics.

13] Earlier we did not have any specialist doctor. Today although he is not personally available, through this telemedicine centre we are able to get his opinion, which to me is very valuable. He does tell us to undertake many tests but he also prescribes medicines that have benefited me greatly. In fact I am trying to convince my husband to come to this centre.
It is seen from the above, while the customers were discussing the service encounters, the issue regarding the complexity of the disease and the delivery of core service through impersonal channel of service delivery is prominent.

The basic reason why remote consultation is given to the patient is because, a highly qualified specialist doctor is absent in the area, and the patient in question requires the attention of a specialist doctor, as he is suffering from something complex, which cannot be diagnosed or treated by a general practitioner.

If highly qualified specialist doctors were available in the area, then the core service of health care would have been delivered directly, and not through an impersonal channel of service delivery.

The patient has to either go to a health care center, where consultations are given remotely through impersonal channel of service delivery or travel to the city to visit the specialist doctor personally. Hence, it is critical that the patient be satisfied with his service encounter at the locally situated telemedicine center.

From the above it is found that disease complexity may have an impact on patient satisfaction, especially when the health care service is provided through an impersonal channel of service delivery, and especially when the customer in this case is a vulnerable consumer (patient).
**Formulation of Hypotheses**

A closer relationship exists when there is face-to-face interaction between customers and providers. Although the service itself remains important, value is added by people and social processes. Interactions may include negotiations and sharing of insights in both directions. This type of relationship has long existed in many local environments, ranging from community banks to health care centers, where buyer and seller know and trust each other. It is also commonly found in many business-to-business services. Both the firm and the customer are prepared to invest resources (including time) to develop a mutually beneficial relationship. This investment may include time spent sharing and recording information.

Customers many times need a continuing dialog focused on an understanding of their needs. Customers are also motivated by continuity of contact, wanting to deal with a specific person on a regular basis. (Lovelock et al, 1992).

As service companies grow larger and make increasing use of such technologies as interactive web sites and self-service equipment, maintaining meaningful relationships with customers becomes a significant marketing challenge.

**Consumer Responses To Service Environments**

The field of environmental psychology studies how people respond to environments. Services marketing academics have applied the theories from this field to better understand and manage customer responses to service environments. (Lovelock et al, 2004)
Feelings as a Key Driver of Customer Responses to Service Environments - The Mehrabian-Russell Stimulus-Response Model

Exhibit 3-1 below shows a simple yet fundamental model of how people respond to environments. The model, adopted from environmental psychology, holds that the environment and its conscious and unconscious perception and interpretation influence how people feel in that environment. (Donovan and Rossiter, 1982); (Lovelock et al, 2004)

People's feelings, in turn, drive their responses to that environment. Feelings are central to the model, which posits that feelings, rather than perceptions or thoughts, drive behavior.

For example, an environment is not avoided simply because there are a lot of people around; rather, one is deterred by the unpleasant feeling of crowding, of people being in the way, of lacking perceived control, and of not being able to get what one wants as quickly as one wishes to. (Lovelock et al, 2004)

Exhibit 3-1: The Mehrabian Russell Stimulus-Response Model
In environmental psychology, the typical outcome variable is approach or avoidance of an environment. In services marketing, one can add a long list of additional outcomes that a firm might want to manage, including how much money people spend while on the firm's premises and how satisfied people are with the service experience after they have left the environment. (Donovan and Rossiter, 1982); (Lovelock et al, 2004)

Thomas Cooper, an expert on mass communication, emphasizes that trust is a critical component of communication. Trust in many cultures involves either touch or direct vision, something that is not achieved with technology. (Zeithaml et al, 2000)

The customer in this case is a patient, who is a vulnerable consumer, (Anderson and Manning, 1990) as he is suffering from a complex disease that needs to be treated. There are no specialist doctors in the geographical vicinity who can treat him, hence he has to come to a Tele medicine center, where he is treated through remote medical consultation. Hence the service delivered is the same, but the service environment is different as an impersonal channel is used for the delivery of the same core service of health care.

The hypotheses are formulated based on this Stimulus-Response Model taken from environmental psychology, where the outcome variable is how satisfied the consumer is with the service experience. The aspect of complexity and its effect on patient satisfaction that has been culled out through the above mentioned critical incident technique has been incorporated in the hypotheses. The hypotheses are formulated based on two types of
service environments - impersonal channel of service delivery and face-to-face service delivery.

**Hypotheses**

H1: In High Involvement and High Complexity situations, customer satisfaction is impacted by channel of service delivery, i.e. service environment.

H1 a: In High Involvement situations, higher levels of complexity lead to lower levels of customer satisfaction, when service is delivered through impersonal channel of service delivery

H1 b: In High Involvement situations, higher levels of complexity lead to increased levels of customer satisfaction when service is delivered directly that is when there is face-to-face contact between consumer and provider.

H2: In High Involvement and Low Complexity situations; the effect of complexity on customer satisfaction will be negligible

H2 a: In High Involvement and Low Complexity situations; the effect of complexity on customer satisfaction will be negligible, when service is delivered through impersonal channel of service delivery.
**H2 b:** In High Involvement and Low Complexity situations; the effect of complexity on customer satisfaction will be negligible, when there is face-to-face contact between consumer and provider.

Health care service is a High Involvement and credence type service (Zeithaml et al, 1996).

Health care is a complex service involving a doctor dealing with the very “person” of the patient. (Parasuraman et al, 1985).

In this situation, Complexity refers to Disease complexity as perceived by the patient, and it is rated on a 5-point likert scale.

Customer is the patient, and hence he/she is a vulnerable consumer. Vulnerable consumers are defined as “those who are at a disadvantage in exchange relationship where that disadvantage is attributable to characteristics that are largely not controllable by them at the time of transaction”. (Anderson and Manning, 1990)

There are two types of service delivery environments.

One is the direct channel where there is face-to-face contact, between consumer and provider.

The other is the impersonal channel of service delivery where the core service of health care is delivered using Telecommunications. In this case there is no face-to-face contact, between consumer and provider.
The above hypotheses, which have been formulated, are taken for empirical testing using quantitative research.

**Quantitative Research**

Quantitative Research clearly is important in assessing and improving service delivery and design. Quantitative research gives managers data from which they can make broad inferences about customer groups. These studies are essential for quantifying customer satisfaction, the importance of service attributes, the extent of service quality gaps, and perceptions of value. (Parasuraman et al, 1990); (Zeithaml et al, 2000)

They also provide the organization with yardsticks to evaluate and track the firm’s service performance. Finally, the results from empirical studies often trigger the need to conduct further qualitative research. Empirical data can highlight specific service deficiencies for deeper qualitative probing. (Parasuraman et al, 1990); (Zeithaml et al, 2000)

**Research Methods**

*Post transaction Surveys*

In this method, customers are asked a list of questions immediately after a particular transaction about their satisfaction with the transaction and contact personnel with whom they interacted. Because the surveys are administered to the customers, and are timed to occur close to service transactions, these surveys are useful in identifying sources of dissatisfaction and satisfaction. Post transaction Surveys have been used to collect the data for this research. (Zeithaml et al, 2000)
Structured questionnaires make key assumptions about what people are conscious of or can recall about their behavior and what they are willing to explain to researchers about their opinions.

**Questionnaire Design**

*Customer Satisfaction Questionnaire*

A customer satisfaction index is a composite of the perceptual satisfaction or service quality measures collected in an organization. (Zeithaml et al, 2000)

**Development of Survey Instrument**

Health care service quality, while related to other service industries, has unique dimensions. The results of the study by Oswald suggest that consumers and observers use two factors—perceived facilities related quality and perceived human factor-related quality—to gauge the quality of health care services. For example, the cleanliness of the facilities and the responsiveness of the hospital staff are possibly more identifiable and more "tangible" in nature. The study also shows that both facilities-related quality and human factor performance-related quality influence customer satisfaction. Hence both these two service quality dimensions affect customer satisfaction. (Oswald et al, 1998)

Hence, the following Survey Instruments have been used to gather data from the patients...
The first survey is the Patient Satisfaction Questionnaire used to measure Patient Satisfaction.

The second and third surveys are questionnaires designed to incorporate the various factors which would evaluate the service quality of the service experience as perceived by the customer which in turn would have an effect on the overall patient satisfaction as measured by the first Patient Satisfaction Questionnaire.

Hence Patient Satisfaction measured by the first questionnaire, is the dependent variable. The second and third questionnaires measure the independent variables, which are the various factors pertaining to the service and which influence patient satisfaction for indirect and direct channel respectively.

[I] Measure for Patient Satisfaction

A 1988 Gallop poll showed that customer satisfaction was influenced more by the concern shown by staff members than by the clinical care. After the delivery of acceptable treatment, patients' perceptions of medical quality are greatly affected by the remaining non-clinical issues. (Oswald et al, 1998)

The most powerful predictor for client satisfaction with government services was provider behavior, especially respect and politeness. For patients this aspect was much more important than the technical competence of the provider. (Aldana et al, 2001)
A 10-item questionnaire on Patient Satisfaction was administered to the patients immediately after the service encounter. This indicated how satisfied the patients were with the experience. A single “overall satisfaction” or “overall quality of care” question may not adequately capture the range of experiences a patient has during an encounter or measure that patient’s satisfaction with the service and care received. Therefore, overall satisfaction was defined as the average of responses to all questions.

The 10-item Patient Satisfaction Questionnaire (PSQ) adopted for use in the study project was based on a measure of patient satisfaction developed by DiMatteo and Hays for a family practice center. The Questionnaire contained 25 items that made up 4 dimensions related to patient satisfaction (general satisfaction, satisfaction with communication of adequate information, satisfaction with affective style, and satisfaction with technical competence of the provider). (DiMatteo and Hays, 1988); (Hailey et al, 2000)

The questionnaire was then limited to 10 items by Hailey because of the physicians' and patient’s time constraints. To insure coverage of each dimension, items were selected from each dimension according to interscale correlations and those items were selected with the highest interscale correlation. 1 item was selected from the general satisfaction dimension, 4 items from the communication dimension, 4 items from the affective style dimension, and 1 item from the technical competence dimension. Hailey modified the wordings of the items but retained their content. (Hailey et al, 2000)
Each item is rated using a 10-point Likert-type scale from 1 to 10, with higher scores reflecting greater satisfaction. Ratings were summed on each item to create a composite index of patient satisfaction, which can range from 10 to 100.

As a reliability estimate, internal consistency has already been calculated of the PSQ by Hailey. Cronbach's alpha was used on the data to test the internal consistency of the Patient Satisfaction Questionnaire. An alpha value of greater than 0.70 is usually taken to indicate adequate internal consistency. Cronbach's alpha was 0.96 which indicated a satisfactory level of internal consistency. (Hailey et al, 2000)

The Patient Satisfaction Questionnaire was administered to the patients after the service encounter where the core service of health care was delivered through impersonal channel of service delivery. The Patient Satisfaction Questionnaire is given below. The Patient Satisfaction Questionnaire was used to measure Patient Satisfaction, since this instrument has already been tested for its reliability and validity.

This Patient Satisfaction Questionnaire was also used for collecting data from patients using direct channel of service delivery where there is face-to-face contact between consumer and provider.
The Patient Satisfaction Questionnaire (PSQ) for Patients' Expressions of their Satisfaction with health care service

For each question, circle the number that best indicates how satisfied you were with:

1. The amount of time the healthcare provider spent with you
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

2. The amount of information that the healthcare provider gave you about your medical condition
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

3. The amount of information the healthcare provider gave you about preventive practices
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

4. The degree of respect with which the healthcare provider treated you
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

5. The relief from worries about your medical condition that the healthcare provider provided
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

6. The amount of time the healthcare provider allotted to hearing what you had to say
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

7. The degree of attention the healthcare provider paid when you talked to him/her
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

8. The degree of kindness and consideration to feelings that the healthcare provider displayed
   Not at all satisfied 1 2 3 4 5 6 7 8 9 10 Extremely satisfied

For the next two questions, circle the number that indicates:

9. How much you would like to have this healthcare provider be your permanent healthcare provider
   Not at all 1 2 3 4 5 6 7 8 9 10 Extremely

10. How confident you are in this healthcare provider
    Not at all confident 1 2 3 4 5 6 7 8 9 10 Extremely confident
Questionnaire regarding attributes of Remote health care service i.e. Telemedicine

Service attributes of health care were culled out from literature and interviews with patients to develop this questionnaire for impersonal channel of service delivery. These service attributes of health care determine perception of service quality.

The Evidence of Service

As services are intangible, customers are searching for evidence of service in every interaction they have with an organization. (Zeithaml et al, 2000)

The three major categories of evidence as experienced by the customer are people, process, and physical evidence. These categories together represent the service and provide the evidence that tangibilizes the offering. The elements comprising the evidence of service are a subset of the new marketing mix elements of services marketing. The new mix elements essentially are the evidence of service in each “moment of truth”. (Bitner et al, 1993); (Zeithaml et al, 2000)

All of these evidence elements, or a subset of them, are present in every service encounter a customer has with a service firm and are critically important in managing service encounter quality and creating customer satisfaction. (Zeithaml et al, 2000)

Matching customer needs to the firm’s capabilities is vital. Managers must think carefully about how customer needs relate to such operational elements as speed and quality, the times when service is available, the firm’s capacity to serve many customers simultaneously, and the physical features and appearance of service facilities. Managers
also need to consider how well their service personnel can meet the expectations of specific types of customers, in terms of both personal style and technical competence.

There are various factors, which affect patient satisfaction. Various provider and patient characteristics and many other factors like situational variables and case characteristics affect patient satisfaction. In order to see the effect of these characteristics on patient satisfaction when the core service of health care is delivered through impersonal channel of service delivery (Telemedicine), the following attributes are taken into consideration while designing the instrument.

These items come under the 7Ps of services marketing, representing a set of control variables of service organizations, which are used to capture the distinctive nature of services.

The provider characteristics are as follows

1] Location of Telemedicine Centre is measured on a five-point scale depending on the time taken to reach the center from less than an hour to more than a day. This item was included in the questionnaire, as convenient location of the Health care center has been found to have an effect on Patient Satisfaction from literature review. (Uzun et al, 2001). This comes under the 2nd P (Place and Time) of the Services Marketing Mix.

2] Cost of Tele-consultation is measured on a five-point scale from very low to extremely high.
3] Cost of Medicines prescribed through Telemedicine treatment is marked on a five-point scale from very low to extremely high.

The items 2] & 3] have been included on the basis of Groocock's definition which considers the relationship between customers' requirements and cost. Cost is usually a constraint in the provision of health services. (Nursing Management, 2002)

*Both these items come under the 4th P (Price and other User Outlays) of the Services Marketing Mix.*

4] Physical environment of Telemedicine center in terms of Cleanliness, Air-conditioning, Sterility and Comfort is marked on a five-point scale from Excellent to very poor.

This item has been included to incorporate the theory of Servicescapes. *This comes under the 5th P (Physical Environment) of the Services Marketing Mix.*

Service environments, also called servicescapes, (Bitner, 1992) relate to the style and appearance of the physical surroundings and other experiential elements encountered by customers at service delivery sites.

For organizations delivering high contact services, the design of the physical environment and the way in which tasks are performed by customer contact personnel jointly play a vital role in creating a particular identity and shaping the nature of the customer’s experience. Thus the service environment and its accompanying atmosphere impact customer satisfaction.
Physical evidence is particularly important for communicating about credence services, but it is also important for services that are dominated by experience attributes like hospitals. In consumer research, it is known that the design of the servicescape can influence customer choices, expectations, satisfaction, and other behaviors. (Bitner, 1992)

5] Speed of medical response regarding Patient illness through Telemedicine consultation is marked on a five-point scale from same day to more than a month.

This item has been included as the Time factor assumes great importance. This comes under the 2nd P (Place and Time) of the Services Marketing Mix.

Many services are delivered in real time while customers are physically present. There are limits as to how long people are willing to spend at the service factory, as customers place a value on their time, and some people are willing to pay more for faster service. Increasingly busy customers expect service to be available at times when it suits them rather than when it suits the service company.

In general, today’s customers are increasingly time sensitive, so that speed is often seen as a key element in good service and as a way to attract new customers. Service marketers need to understand customers’ time constraints and priorities, which may vary from one market segment to another, and to look for ways to compete on speed and to minimize waiting times.
6] Time spent in waiting room before Telemedicine Consultation is marked on a five-point scale from less than three hours to more than ten hours. *This comes under the 2\textsuperscript{nd} P (Place and Time) of the Services Marketing Mix.*

Waiting time is an indicator of service quality in that it examines several of Maxwell's (1984) six dimensions of quality, including the effectiveness and efficiency of the outpatient service to patients. Waiting times have constantly been a problem for outpatient clinics. Waiting refers to the (clock) time from scheduled appointment to consultation on the day of an outpatient department visit (National Audit Office, 1992). Difficulties with the latter can include overbooking patients or scheduling appointment priorities on a 'first-come first-served' basis (Hart, 1996); (McCarthy et al, 2000)

Long waiting times in outpatient clinics appear to be a consistent and major source of dissatisfaction (Evans & Wakefield, 1964); (Hart, 1995); (Jones et al, 1987); (McCarthy et al, 2000)

7] Availability of Telemedicine provider during medical emergencies is marked on a five-point scale from all the time to 25% of the time. *This comes under the 2\textsuperscript{nd} P (Place and Time) of the Services Marketing Mix.*

Availability can pose a problem as waiting lists may be maintained by internal referral in the hospital itself and by referrals from accident and emergency departments and General Practitioners (Mason, 1992); (McCarthy et al, 2000)
8] Usefulness of information provided by the Telemedicine Clinic regarding the medical condition of the patient is marked on a five-point scale from extremely useful to not at all useful.

This item has been included as it is found from literature that patients who perceive that they have received adequate information regarding diagnosis, prognosis, and treatment options tend to be more satisfied. (Lewis, 1994); (Ong et al, 1995); (Frederickson, 1995); (Greenhow et al, 1998). The failure to communicate information about the condition and treatment options is the most frequent source of patient dissatisfaction. (Hudak and Wright, 2000)

Furthermore, patients tend to be more satisfied when physicians convey information in a manner that is more understandable to them and when the physicians use speech that is consistent with patients' usage. (Rowland-Morin et al, 1990) Patient satisfaction is related to patient perceptions of physicians' interpersonal and communication skills. (Buller et al, 1987); (Philips, 1996) Some evidence suggests that patients tend to be more satisfied when providers treat the medical relationship as a mutual partnership, (Cecil, 1998); (Anderson et al, 1993) when providers show some interest in patients' personal lives, (Dunfield, 1996) and when providers address the patients by their first names, as opposed to titles and last names. (Twemlow et al, 1995)

9] Technical inconveniences faced during Telemedicine treatment is marked on a five-point scale from none to 10 or more. This variable has been included in the questionnaire, as it found from a study by Bethel and Ridder that Technical aspects affect Patient Satisfaction. (Bethel & Ridder, 1994)
10] Experience level of doctors offering Tele-consultation marked on a five-point scale from high to low

11] Reputation of the doctors offering Tele-consultation marked on a five-point scale from high to low

Items 10] and 11] have been included to incorporate the assurance aspect in the service, whether the customer that is the patient has trust and confidence in the service provider. In this case the provider is the doctor who is giving the patient a medical consultation and treating him/her.

*The Case characteristics are as follows*

12] Health position of the patient at present marked on a five-point scale from very good to very bad.

13] Level of complexity of the disease being treated through Telemedicine i.e. Disease complexity is marked on a five point scale from Least Complex to Extremely Complex

14] Level of Urgency advised by doctor for Telemedicine treatment marked on a five-point scale from requiring immediate treatment to not at all urgent.

15] Number of diagnostic procedures advised after Tele-consultation marked on a five-point scale from none to 10 or more.
The case characteristics mentioned in items 12], 13], 14] and 15] have been included to obtain a holistic view of the medical condition of the patient, and see their effects on satisfaction.

*The patient characteristics are as follows*

16] & 17] Cost of long distance transport and local transport as perceived by the patient marked on a five-point scale from very low to extremely high. *This comes under the 4th P (Price and other user outlays) of the Services Marketing Mix.*

This item has been included keeping in mind the relationship between customers' requirements and cost developed by Groocock. Cost is usually a constraint in the provision of health services. (Nursing Management, 2002)

18] Level of comfort with Telemedicine treatment procedure marked on a five-point scale from extremely comfortable to not at all comfortable. *This comes under the 6th P (Process) of the Services Marketing Mix.*

19] Familiarity with concept of Telemedicine marked on a five-point scale from Extremely familiar to Not at all familiar.

The items 18] & 19] have been included for the purpose of Behavioral segmentation - Dividing buyers to form groups based on knowledge, attitude, uses, or responses to a service. Patients and their carers are concerned about the nature and comfort of their
environment. All these will differ for different groups of patients with different expectations and cultural backgrounds. (Nursing Management, 2002)

20] Level of Comfort with the new technology used in Telemedicine marked on a five-point scale from extremely comfortable to not at all comfortable. This aspect has been included in the questionnaire as it is found from a study by Bethel and Rider that the technology aspect has an impact on patient satisfaction. (Bethel & Rider, 1994) This comes under the 6th P (Process) of the Services Marketing Mix.

The patient characteristics also include the demographic variables

This is for the purpose of Market Segmentation.

21] Age of patient,

23] Monthly income of patient marked on a five-point scale from above 1 lakh to below 10,000

The variables 21], 22] and 23] have been considered for Demographic segmentation to divide the market to form groups on variables such as age, gender and income.

24] Education level of patient from Post Graduate/Professional to primary school has been considered for Behavioral segmentation to divide the buyers to form groups based on knowledge.
25] Type of locale patient hails from marked on a five-point scale from village, suburb, Town, city and Metro has been considered for Geographic segmentation to divide the market to form different geographic units.

The situational variables are as follows

26] Mode of long distance transport chosen by patient to avail of Telemedicine treatment is marked on a five-point scale from personal car, taxi, bus, train and plane.

27] Mode of local transport chosen by patient to avail of Telemedicine treatment marked on a five-point scale from walking, bus rickshaw, taxi and personal car

The above two variables 26] and 27] of mode of transport have been considered for Psychographic segmentation to divide the market to form groups based on social class, lifestyle, or personality characteristics.

28] Frequency of visits to Telemedicine clinic marked on a five-point scale from once or more in a week to not even once a year

29] Time spent in a Tele-consultation marked on a five-point scale from more than an hour to less than 15 minutes.

Increased patient satisfaction has also been associated with longer medical visits; (Lewis, 1994); (Greene et al, 1994); (Smith et al, 1981); with healthcare providers' giving patients an opportunity to express concerns and ask questions (Greene et al, 1994); and when physicians engage in more patient-centered activities, such as providing information and discussing potential treatment options, as opposed to more
physician-centered activities, such as asking questions of and giving directions to the patient. (Dunfield, 1996); (Roter et al, 1987). Providers who use closed questions and who frequently interrupt patients tend to have patients who are less satisfied and less compliant with physicians' advice. (Rabinowitz et al, 1994)

All the above 29 attributes are independent variables and can have an effect on patient satisfaction, as seen in the review of related literature.

Patient perceptions of Telemedicine health care should be assessed with a response scale which is methodologically sound. The Likert type response scale was ultimately chosen with the following basic response anchors: very poor, poor, fair, good and very good. The very poor-very good scale is balanced and parallel, so responses can be quantified and differences analyzed properly. Moreover, the scale addresses the issues of patients' typical reluctance to criticize their health care providers and of artificial score inflation found with the use of other scales. (Krosnick, 1999)

Keeping in mind the hypotheses to be tested, and by taking the various variables identified, a structured closed-ended questionnaire was designed. This questionnaire has been designed to measure the independent variables which affect Patient Satisfaction. There are in all 29 independent variables, each measured by using a 5-point Likert Scale or a multiple-choice question.
Questionnaire for Tele-Medicine Research (Indirect Channel)

Code # : _______
Date: _______ Day: M T W T F Age: _______ Gender : O Male O Female

1. How do you rate your health position at present?
   O Very Good   O Good   O Moderate   O Bad   O Very Bad

2. What is the level of complexity of the disease being treated through telemedicine?
   O Least Complex   O Complex   O Moderately Complex   O Very Complex   O Extremely Complex

3. How urgently did your doctor advice Telemedicine Treatment?
   O Require immediate treatment   O Urgent   O Moderately Urgent   O Not so Urgent   O Not at all Urgent

4. How many times do you visit a Telemedicine Clinic?
   O Once or more in a week   O Once or twice a month   O Once in three months   O Once or twice a year   O Not even once a year

5. How much time does it take you to reach the city where the Telemedicine Centre is located?
   O Less than 1 hour   O 1-3 hrs   O Half a day   O 1 day   O More than 1 day

6. What mode of long distance transport did you use in order to avail of Telemedicine treatment?
   O Personal car   O Taxi   O Bus   O Train   O Plane

7. How do you rate the cost of long distance transport in order to avail of Telemedicine treatment?
   O Very Low   O Low   O Moderate   O High   O Extremely High

8. What mode of local transport did you use in order to avail of Telemedicine treatment?
   O Walking   O Bus   O Rickshaw   O Taxi   O Personal car

9. How do you rate the cost of local transport to avail of Telemedicine treatment?
   O Very Low   O Low   O Moderate   O High   O Extremely High

10. How do you rate the cost of medicines prescribed through Telemedicine treatment?
    O Very Low   O Low   O Moderate   O High   O Extremely High

11. How do you rate the cost of consultation for Telemedicine treatment?
    O Very Low   O Low   O Moderate   O High   O Extremely High

12. How do you rate the Physical Environment of your Telemedicine centre? (An environment, which can indicate “Patient Care” without undergoing the experience (for example like a hotel) in terms of Cleanliness, Air-conditioning, Sterility & Comfort.)
    O Excellent   O Very Good   O Moderate   O Poor   O Very Poor

13. How fast do you get medical feedback regarding your illness through Telemedicine consultation?
    O On the same day   O 2-7 days   O 8-15 days   O 15-30 days   O >30 days

14. In general, how much time do you spend in the waiting room before your telemedicine consultation?
    O <= 3hrs   O 4-5 hrs   O 6-7 hrs   O 8-9 hrs   O > = 10 hrs
15. In general, how much time do you spend in a telemedicine consultation?
   - More than 1 hour
   - 1 hour
   - 30 -45 mins
   - 15 -30 mins
   - Less than 15 mins

16. How many diagnostic procedures have you been asked to undertake after your telemedicine consultation?
   - None
   - 1-3
   - 4-6
   - 7-9
   - 10 or more

17. How confident are you that your Telemedicine provider will be available to you during medical emergencies?
   - All the time
   - 90% of the time
   - 75% of the time
   - 50% of the time
   - 25% of the time

18. How comfortable are you with the Telemedicine treatment procedure?
   - Extremely Comfortable
   - Reasonably Comfortable
   - Tolerable
   - Uncomfortable
   - Not at all comfortable

19. How useful was the information provided by the telemedicine clinic regarding your medical condition?
   - Extremely Useful
   - Useful
   - Moderately Useful
   - Not So Useful
   - Not at all Useful

20. How familiar are you with the concept of telemedicine?
   - Extremely Familiar
   - Familiar
   - Moderately Familiar
   - Not So Familiar
   - Not at all familiar

21. How comfortable are you with the new Technology used in Telemedicine?
   - Extremely Comfortable
   - Reasonably Comfortable
   - Tolerable
   - Uncomfortable
   - Not at all comfortable

22. How many times have you faced any kind of technical inconveniences during your Telemedicine treatment?
   - None
   - 1-3
   - 4-6
   - 7-9
   - 10 or more

23. What do you think is the experience level of the doctors who are treating you through telemedicine?
   - High
   - 5
   - 4
   - 3
   - 2
   - 1
   - Low

24. What do you think is the reputation of the panel of doctors treating you through Telemedicine?
   - High
   - 5
   - 4
   - 3
   - 2
   - 1
   - Low

25. What is your Educational level?
   - Post Graduate/ Professional
   - Graduate
   - SSC/HSC
   - Non-Matric
   - Primary School

26. Please indicate which type of locale you come from:
   - Village
   - Suburb
   - Town
   - City
   - Metro

27. What is your monthly Income?
   - Above 1 Lakh
   - 50,000 <= 1,00,000
   - 25,000 < 50,000
   - 10,000 < 25,000
   - below 10,000
Questionnaire regarding attributes of face-to-face health care service

The above remote health care service questionnaire was used to collect data from patients using the indirect channel. The above questionnaire was then suitably modified to collect data from patients using the direct channel where there is face-to-face contact between consumer and provider. Items pertaining to Telemedicine technology were deleted from the above questionnaire.

Thus keeping in mind the hypotheses to be tested, and by taking the various variables identified, another structured closed-ended questionnaire was designed to be used when there is face-to-face contact between consumer and provider.

This questionnaire has been designed to measure the independent variables which affect Patient Satisfaction in face-to-face health care. There are in all 23 independent variables, each measured by using a 5-point Likert Scale or a multiple-choice question.
Questionnaire for Face-to-Face Health care Research (Direct Channel)

Code #: ________
Date: ________ Day: M T W T F Age: ________ Gender : O Male O Female

1. How do you rate your health position at present?
   O Very Good O Good O Moderate O Bad O Very Bad

2. What is the level of complexity of the disease being treated?
   O Least Complex O Complex O Moderately Complex O Very Complex O Extremely Complex

3. How urgently did your doctor advice Treatment?
   O Require immediate treatment O Urgent O Moderately Urgent O Not so Urgent O Not at all Urgent

4. How many times do you visit the Clinic?
   O Once or more in a week O Once or twice a month O Once in three months O Once or twice a year O Not even once a year

5. How much time does it take you to reach the city where the Health care Centre is located?
   O Less than 1 hour O 1-3 hrs O Half a day O 1 day O More than 1 day

6. What mode of local transport did you use in order to avail of treatment?
   O Walking O Bus O Rickshaw O Taxi O Personal car

7. How do you rate the cost of local transport to avail of medical treatment?
   O Very Low O Low O Moderate O High O Extremely High

8. How do you rate the cost of medicines prescribed?
   O Very Low O Low O Moderate O High O Extremely High

9. How do you rate the cost of medical consultation?
   O Very Low O Low O Moderate O High O Extremely High

10. How do you rate the Physical Environment of your Health care centre? (An environment, which can indicate “Patient Care” without undergoing the experience (for example like a hotel) in terms of Cleanliness, Air-conditioning, Sterility & Comfort.)
    O Excellent O Very Good O Moderate O Poor O Very Poor

11. How fast do you get medical feedback regarding your illness through consultation?
    O On the same day O 2-7 days O 8-15 days O 15-30 days O >30 days

12. In general, how much time do you spend in the waiting room before your consultation?
    O <= 3hrs O 4-5 hrs O 6-7 hrs O 8-9 hrs O >= 10 hrs

13. In general, how much time do you spend in a consultation?
    O More than 1 hour O 1 hour O 30-45 mins O 15-30 mins O Less than 15 mins

14. How many diagnostic procedures have you been asked to undertake after your consultation?
    O None O 1-3 O 4-6 O 7-9 O 10 or more

- 72 -
15. How confident are you that your Health care provider will be available to you during medical emergencies?

- All the time 0 90% of the time 0 75% of the time 0 50% of the time 0 25% of the time

16. How useful was the information provided by the health care provider regarding your medical condition?

- Extremely Useful 0 Useful 0 Moderately Useful 0 Not So Useful 0 Not at all Useful

17. What do you think is the experience level of the doctors who are treating you?

- High 5 4 3 2 1 Low

18. What do you think is the reputation of the panel of doctors treating you?

- High 5 4 3 2 1 Low

19. What is your Educational level?

- Post Graduate/ Professional 0 Graduate 0 SSC/ HSC 0 Non- Matric 0 Primary School

20. Please indicate which type of locale you come from:

- Village 0 Suburb 0 Town 0 City 0 Metro

21. What is your monthly Income?

- Above 1 Lakh 0 50,000 <= 1,00,000 0 25,000 < 50,000 0 10,000 < 25,000 0 below 10,000

Pre-testing of the Questionnaires

The questionnaires developed were pre-tested with twenty patients mainly to ascertain whether the words and phrases used in the questionnaire convey the same meaning as the researcher wanted to convey and also to check whether there is a smooth flow of questions.

Before initiating the data collection, the survey and questionnaires were submitted to the Health care service center authorities for review and only after receiving an approval from them, the surveys were administered.
Method

Sampling and Data Collection

An integral component of a research design is the sampling plan. Specifically, the sampling plan addresses three questions: whom to survey (the sampling unit), how many to survey (the sample size), and how to select them (the sampling procedure).

Sampling unit

In this research there are two sampling units —

➢ Patients availing of health care service through impersonal channel of service delivery (telemedicine)

➢ Patients availing of health care service through direct channel where there is face-to-face contact between patient and healthcare provider.

Sample size

The sample size chosen for each of the two sampling units is 200. Hence a total of 400 patients were surveyed.

Sampling procedure

A probability sample is chosen. Simple random sampling method is used where every member of the population has a known and equal chance of being selected.
On one hand, the Patient Satisfaction Questionnaire and the Questionnaire for Tele-Medicine Research (Indirect Channel) were administered to a sample of 200 patients availing of health care service through impersonal channel of service delivery (telemedicine).

On the other hand, the Patient Satisfaction Questionnaire and the Questionnaire for Face-to-Face Health care Research (Direct Channel) were administered to a sample of 200 patients availing of health care service through direct channel where there is face-to-face contact between patient and healthcare provider.

➢ The Patient Satisfaction Questionnaire is used for measuring the dependent variable "Patient Satisfaction".

➢ The Questionnaire for Tele-Medicine Research (Indirect Channel) measures the independent variables pertaining to remote health care service.

➢ The Questionnaire for Face-to-Face Health care Research (Direct Channel) measures the independent variables pertaining to face-to-face health care service.

Every patient was asked if he or she would be willing to participate in a confidential study of patient satisfaction that would in no way affect his or her healthcare.
The procedure involved the patient population but kept the healthcare provider blind about whether a particular patient was a study participant or not. It also caused minimal disruption of clinic routines.

Patients who expressed interest in the study were given a detailed explanation about the study which also stated that, although aggregate data would be provided to healthcare providers at the conclusion of the study, individual data would be confidential.

Patients after listening to the explanation told the researcher whether they were willing to participate. The refusal rate was extremely low (4 patients). At the end of the medical encounter, each patient was interviewed by the researcher, and the questionnaires were completed.

Preliminary Analyses

Statistical Inferential Analyses of data obtained from the above surveys were carried out using the SPSS software package version 11.0. The data from the questionnaires were tabulated, and analyzed using step-wise regression.

For the Patient Satisfaction Questionnaire, each of the 10 items was rated using a 10-point Likert-type scale from 1 to 10, with higher scores reflecting greater satisfaction. Ratings are summed on each item to create a composite index of patient satisfaction, which can range from 10 to 100. This composite index of patient satisfaction was used for entering in the regression analysis.
Stepwise Regression

Stepwise regression is a technique for choosing the variables, i.e., terms, to include in a multiple regression model. Forward stepwise regression starts with no model terms. At each step it adds the most statistically significant term (the one with the highest F statistic or lowest p-value) until there are none left.

An important assumption behind the method is that some input variables in a multiple regression do not have an important explanatory effect on the response. If this assumption is true, then it is a convenient simplification to keep only the statistically significant terms in the model.

One common problem in multiple regression analysis is multicollinearity of the input variables. The input variables may be as correlated with each other as they are with the response. If this is the case, the presence of one input variable in the model may mask the effect of another input. Stepwise regression might include different variables depending on the choice of starting model and inclusion strategy.

There are 3 basic assumptions while using Regression

- Normality
- Linearity
- No Multicollinearity

The issue of multicollinearity is checked through VIF scores and tolerance levels and it was found that there was no multicollinearity of the input variables. Normality and linearity are also tested through appropriate statistical techniques.
All these assumptions have been checked in this analysis.

There are six scenarios, which are discussed below.

In order to explain the variation in the dependent variable (Patient Satisfaction), based on the variation in all other independent variables, regression analysis was carried out. The multiple regression technique was used to arrive at the regression model in each scenario.

Tables shown below within each Scenario give the results of regression analysis for that particular scenario.

➢ Table A - The first table gives predictor variables entered and the dependent variable.

➢ Table B – The second table gives the regression model summary.

➢ Table C - The third table gives the results of analysis of variance.

➢ Table D - The last table gives the details of the coefficients of each predictor variable, the beta-values, the t-values and the significance level.

➢ The first chart is a histogram and checks for normality.

➢ The second chart is the Probability plot which checks for linearity.

Beta Weights - These are standardized regression coefficients used to compare the contribution to the explanation of the variance of the dependent variable within the model.

T tests and Significance - These are the tests of significance for each parameter estimate. The significance levels have to be less than .05 for the parameter to be statistically significant.
Scenario 1 – Impersonal channel of Service delivery (Indirect Channel)

In Scenario 1, the following two questionnaires are tabulated. The sample size is 200 as mentioned earlier.

➢ The Patient Satisfaction Questionnaire is used for measuring the dependent variable “Patient Satisfaction”.

➢ The Questionnaire for Tele-Medicine Research (Indirect Channel) measures the independent variables pertaining to remote health care service.

Composite scores on the PSQ ranged from 42 to 98 (M = 74.71, SD = 11.26). These scores indicated a high degree of overall patient satisfaction with the providers.
Descriptive Statistics (Indirect channel)

- 200 patient respondents
- 32% of the respondents were in the age group of 41-60, 20% in the age group of 25-40 as shown below in Exhibit 3-2
- 81% of the respondents were male and 19% were female as shown below in Exhibit 3-3
- 34% are SSC/HSC and 28.5% are graduate as shown in Exhibit 3-4
- 76% of the respondents earn less than 10,000 per month as shown below in Exhibit 3-5

<table>
<thead>
<tr>
<th>Exhibit 3-2: Age</th>
<th>Exhibit 3-3: Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
</tr>
<tr>
<td>Age</td>
<td>Frequency</td>
</tr>
<tr>
<td>Validation &lt; 25</td>
<td>35</td>
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<tr>
<td>25-40</td>
<td>40</td>
</tr>
<tr>
<td>41-60</td>
<td>64</td>
</tr>
<tr>
<td>61-80</td>
<td>37</td>
</tr>
<tr>
<td>&gt;80</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhibit 3-4: Educational level of patient</th>
<th>Exhibit 3-5: Monthly Income of Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational level of Patient</td>
<td>Monthly Income of Patient</td>
</tr>
<tr>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Valid</td>
<td></td>
</tr>
<tr>
<td>Primary School</td>
<td>5</td>
</tr>
<tr>
<td>Non Metric</td>
<td>19</td>
</tr>
<tr>
<td>SSC/HSC</td>
<td>69</td>
</tr>
<tr>
<td>Graduate/Diploma</td>
<td>57</td>
</tr>
<tr>
<td>Post Graduate/Professional</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
</tr>
</tbody>
</table>

- 80 -
Regression Analysis for Scenario 1

Exhibit 3-6: Scenario 1 – Table A – Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disease Complexity</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050). Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>2</td>
<td>Experience level of doctor treating you through TM</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050). Probability of F-to-remove &gt;= .100).</td>
</tr>
</tbody>
</table>

* Dependent Variable: Patient Satisfaction Index

From the Exhibit 3-6 Scenario 1 – Table A, it is seen that only two predictor variables have been entered. These are the independent variables.

➢ Disease Complexity

➢ Experience level of the doctor treating the patient through Telemedicine

The dependent variable is Patient Satisfaction.
Model Summary

Exhibit 3-7: Scenario 1 – Table B – Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of Estimate</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>.722</td>
<td>.522</td>
<td>.519</td>
<td>7.81113</td>
<td>.022</td>
</tr>
<tr>
<td>2</td>
<td>.733</td>
<td>.538</td>
<td>.533</td>
<td>7.69698</td>
<td>.016</td>
</tr>
</tbody>
</table>

* a. Predictors: (Constant), Disease Complexity
* b. Predictors: (Constant), Disease Complexity, Experience level of doctor treating you through TM
* c. Dependent Variable: Patient Satisfaction Index

It is seen from Exhibit 3-7: Scenario 1 – Table B that the R Square value is 0.538, which means the regression model explains about 54% of the total variance. In other words it means that about 54% of the variation in patient satisfaction is explained by these two independent variables in the model.

Exhibit 3-8: Scenario 1 – Table C – Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>13166.446</td>
<td>1</td>
<td>13166.446</td>
<td>215.795</td>
</tr>
<tr>
<td>Residual</td>
<td>12080.734</td>
<td>198</td>
<td>61.014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25247.180</td>
<td>199</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>13579.250</td>
<td>2</td>
<td>6789.625</td>
<td>114.635</td>
</tr>
<tr>
<td>Residual</td>
<td>11667.930</td>
<td>197</td>
<td>59.228</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25247.180</td>
<td>199</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* a. Predictors: (Constant), Disease Complexity
* b. Predictors: (Constant), Disease Complexity, Experience level of doctor treating you through TM
* c. Dependent Variable: Patient Satisfaction Index

The regression model is statistically significant as may be seen from the analysis of variance table i.e. Exhibit 3-8: Scenario 1 – Table C, which indicates the p-value to be 0.000, which means the model is statistically significant at a confidence level of 99.999%. It shows that the F-test is significant.
Exhibit 3-9: Scenario 1 – Table D – Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>(Constant)</th>
<th>Disease Complexity</th>
<th>Experience level of doctor treating you through TM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>Disease Complexity</td>
<td>Experience level of doctor treating you through TM</td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>Disease Complexity</td>
<td>Experience level of doctor treating you through TM</td>
</tr>
</tbody>
</table>

As seen from the Exhibit 3-9: Scenario 1 – Table D – Coefficients, the two significant predictor variables are Disease Complexity with a Beta value -7.297 and Experience level of doctor with a Beta value of 5.461.

**Checking for Multi-collinearity**

From Exhibit 3-9, it is seen that the Variable Inflation Factor (VIF) is close to one (1.002) and tolerance values are greater than 0.2 (0.998) indicating that there is no multi-collinearity with other variables.

The regression model thus is represented as follows for Scenario 1

Patient Satisfaction = 67.41 – 7.297 (Disease Complexity) + 5.461 (Experience level of doctor)

This equation that is obtained means that patient satisfaction will decrease with the proportionate decrease in the 'Experience level of doctor' and with an increase in the 'complexity of the disease'.
Checking for Normality

Exhibit 3-10: Scenario 1 - Histogram – Regression Standardized Residual

Error term should be normally distributed. Hence Histogram is drawn and a normal curve is superimposed on the histogram. The histogram in Exhibit 3-10 indicates that the error term is normally distributed.

Checking for Linearity

Exhibit 3-11: Scenario 1 - Normal P-P Plot of Regression Standardized Residual

This is to check whether the variables are having a linear relationship or not. The probability plot in Exhibit 3-11 shows that the variables have a linear relationship.
Significant Variables of Patient Satisfaction

(a) Disease Complexity

Disease Complexity is one of the predictor variables. It is a Case characteristic. It has an unstandardized coefficient value of $-7.297$ and the "t-value" of $-14.769$ at a p-value of 0.000. The beta coefficient value is $-0.716$. It means 'Disease Complexity' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Disease Complexity is negatively related to Patient satisfaction. The more complex the disease, the less satisfied the patients are with impersonal channel of service delivery. In fact it has emerged as the most dominant variable affecting satisfaction explaining about 52% of the total variance in satisfaction.

(b) Experience level of the doctor treating the patient through Telemedicine

Experience level of the doctor treating the patient through Telemedicine is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of $5.461$ and the "t-value" of $2.64$ at a p-value of 0.009. The beta coefficient value is $0.128$. It means 'Experience level of the doctor treating the patient through Telemedicine' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Experience level of the doctor treating the patient is positively related to Patient satisfaction. The more the Experience level of the doctor treating the patient, the more satisfied the patients are with the health care service.
Scenario 2 – Face-to-face Health care service delivery (Direct Channel)

In Scenario 2, the following two questionnaires are tabulated. The sample size is 200 as mentioned earlier.

➢ The Patient Satisfaction Questionnaire is used for measuring the dependent variable “Patient Satisfaction”.

➢ The Questionnaire for Face-to-Face Health care Research (Direct Channel) measures the independent variables pertaining to face-to-face health care service.

Composite scores on the PSQ ranged from 14 to 100 (M = 73.19, SD = 12.39). These scores indicated a high degree of overall patient satisfaction with the providers.
Descriptive Statistics (Direct channel)

- 200 patient respondents
- 58.5% of the respondents were in the age group of 61-80, 22% in the age group of 41-60 as shown below in Exhibit 3-12
- 65.5% of the respondents were male and 34.5% were female as shown below in Exhibit 3-13
- 30% are Non matric and 24% are SSC/HSC as shown in Exhibit 3-14
- 60% of the respondents earn less than 10,000 per month as shown below in Exhibit 3-15

<table>
<thead>
<tr>
<th>Exhibit 3-12: Age</th>
<th>Exhibit 3-13: Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td><strong>Sex</strong></td>
</tr>
<tr>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Valid &lt;25</td>
<td>15</td>
</tr>
<tr>
<td>25-40</td>
<td>7</td>
</tr>
<tr>
<td>41-60</td>
<td>44</td>
</tr>
<tr>
<td>61-80</td>
<td>117</td>
</tr>
<tr>
<td>&gt;80</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exhibit 3-14: Educational level of Patient</th>
<th>Exhibit 3-15: Monthly Income of Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Educational level of Patient</strong></td>
<td><strong>Monthly Income of Patient</strong></td>
</tr>
<tr>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>Valid Primary School</td>
<td>52</td>
</tr>
<tr>
<td>Non Matric</td>
<td>60</td>
</tr>
<tr>
<td>SSC/HSC</td>
<td>48</td>
</tr>
<tr>
<td>Graduate/Diploma</td>
<td>17</td>
</tr>
<tr>
<td>Post Graduate/Professional</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
</tr>
</tbody>
</table>
Regression Analysis for Scenario 2

Exhibit 3-16: Scenario 2 – Table A – Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Reputation of doctor treating you</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= 0.050, Probability of F-to-remove &gt;= 0.100).</td>
</tr>
<tr>
<td>2</td>
<td>Speed of Medical Feedback through Consultation</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= 0.050, Probability of F-to-remove &gt;= 0.100).</td>
</tr>
<tr>
<td>3</td>
<td>Confidence that you will avail of health care provider in emergencies</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= 0.050, Probability of F-to-remove &gt;= 0.100).</td>
</tr>
<tr>
<td>4</td>
<td>Time spent in Waiting room</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= 0.050, Probability of F-to-remove &gt;= 0.100).</td>
</tr>
<tr>
<td>5</td>
<td>Experience level of doctor treating you</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= 0.050, Probability of F-to-remove &gt;= 0.100).</td>
</tr>
<tr>
<td>6</td>
<td>No of Diagnostic Procedure s advised</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= 0.050, Probability of F-to-remove &gt;= 0.100).</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Patient Satisfaction Index
From the Exhibit 3-16 Scenario 2 — Table A, it is seen that six predictor variables have been entered. These are the independent variables.

➢ Reputation of doctor treating the patient
➢ Speed of medical feedback through consultation
➢ Confidence that one will avail of health care provider in emergencies
➢ Time spent in waiting room
➢ Experience level of the doctor treating the patient
➢ Number of diagnostic procedures advised

The dependent variable is Patient Satisfaction.

Model Summary

Exhibit 3-17: Scenario 2 — Table B — Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.708*</td>
<td>.501</td>
<td>.499</td>
<td>.877.59</td>
<td>.001</td>
<td>198.949</td>
<td>1</td>
<td>198</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>.788b</td>
<td>.621</td>
<td>.617</td>
<td>7.87485</td>
<td>.119</td>
<td>61.985</td>
<td>1</td>
<td>197</td>
<td>.000</td>
</tr>
<tr>
<td>3</td>
<td>.820c</td>
<td>.672</td>
<td>.667</td>
<td>7.15199</td>
<td>.052</td>
<td>30.856</td>
<td>1</td>
<td>196</td>
<td>.000</td>
</tr>
<tr>
<td>5</td>
<td>.833e</td>
<td>.695</td>
<td>.687</td>
<td>6.93787</td>
<td>.012</td>
<td>7.397</td>
<td>1</td>
<td>194</td>
<td>.007</td>
</tr>
<tr>
<td>6</td>
<td>.837f</td>
<td>.701</td>
<td>.692</td>
<td>6.88085</td>
<td>.007</td>
<td>4.223</td>
<td>1</td>
<td>193</td>
<td>.041</td>
</tr>
</tbody>
</table>

* Predictors: (Constant), Reputation of doctor treating you
b. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation
c. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies
d. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies, Time spent in Waiting room
e. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies, Time spent in Waiting room, Experience level of doctor treating you
f. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies, Time spent in Waiting room, Experience level of doctor treating you, No of Diagnostic Procedures advised

It is seen from Exhibit 3-17: Scenario 2 — Table B that the R Square value is 0.701, which means the regression model explains about 70% of the total variance. In other words it
means that about 70% of the variation in patient satisfaction is explained by these six independent variables in the model.

Exhibit 3-18: Scenario 2 – Table C – Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>15328.264</td>
<td>1</td>
<td>15328.264</td>
<td>198.949</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>15255.131</td>
<td>198</td>
<td>77.046</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30583.395</td>
<td>199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>18979.404</td>
<td>2</td>
<td>9489.702</td>
<td>161.106</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>11603.991</td>
<td>197</td>
<td>58.904</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30583.395</td>
<td>199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Regression</td>
<td>20557.809</td>
<td>3</td>
<td>6852.603</td>
<td>133.968</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>10025.586</td>
<td>196</td>
<td>51.151</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30583.395</td>
<td>199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Regression</td>
<td>20889.323</td>
<td>4</td>
<td>5222.331</td>
<td>105.049</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>9694.072</td>
<td>196</td>
<td>49.713</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30583.395</td>
<td>199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Regression</td>
<td>21245.379</td>
<td>5</td>
<td>4249.076</td>
<td>88.276</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>9338.016</td>
<td>194</td>
<td>48.134</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30583.395</td>
<td>199</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Regression</td>
<td>21445.341</td>
<td>6</td>
<td>3574.224</td>
<td>75.489</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>9138.054</td>
<td>193</td>
<td>47.347</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30583.395</td>
<td>199</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Reputation of doctor treating you
b. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation
c. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies
d. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies, Time spent in Waiting room
e. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies, Time spent in Waiting room, Experience level of doctor treating you
f. Predictors: (Constant), Reputation of doctor treating you, Speed of Medical Feedback through Consultation, Confidence that you will avail of health care provider in emergencies, Time spent in Waiting room, Experience level of doctor treating you, No of Diagnostic Procedures advised
g. Dependent Variable: Patient Satisfaction Index

The regression model is statistically significant as may be seen from the analysis of variance table i.e. Exhibit 3-18: Scenario 2 – Table C, which indicates the p-value to be 0.000, which means the model is statistically significant at a confidence level of 99.999%. It shows that the F-test is significant
Exhibit 3-19: Scenario 2 – Table D – Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
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<tr>
<td></td>
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<tr>
<td>4</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Coefficients***

- Dependent Variable: Patient Satisfaction Index
As seen from the Exhibit 3-19: Scenario 2 – Table D – Coefficients, the six significant predictor variables are as follows

➢ Reputation of doctor treating the patient with Beta value 4.099

➢ Speed of medical feedback through consultation with Beta value 5.79

➢ Confidence that one will avail of health care provider in emergencies with Beta value 3.304

➢ Time spent in waiting room with Beta value −2.216

➢ Experience level of the doctor treating the patient with Beta value 2.814

➢ Number of diagnostic procedures advised with Beta value −1.144

Checking for Multi-collinearity

From Exhibit 3-19, it is seen that the Variable Inflation Factor (VIF) is close to one and tolerance values are greater than 0.2 indicating that there is no multi-collinearity with other variables.

The regression model thus is represented as follows for Scenario 2

Patient Satisfaction = 15.184 + 4.099 (Reputation of doctor) + 5.79 (Speed of medical feedback through consultation) + 3.304 (Confidence that one will avail of health care provider in emergencies) − 2.216 (Time spent in waiting room) + 2.814 (Experience level of doctor) − 1.144 (Number of diagnostic procedures advised)
This equation that is obtained means that patient satisfaction will increase with the proportionate increase in the ‘Reputation of doctor’, ‘Speed of medical feedback through consultation’, ‘Confidence that one will avail of health care provider in emergencies’, and ‘Experience level of doctor’ and patient satisfaction will decrease with an increase in the ‘Time spent in waiting room’ and ‘Number of diagnostic procedures advised’.

Checking for Normality

Exhibit 3-20: Scenario 2 - Histogram – Regression Standardized Residual

Error term should be normally distributed. Hence Histogram is drawn and a normal curve is superimposed on the histogram. The histogram in Exhibit 3-20 indicates that the error term is normally distributed
Checking for Linearity

Exhibit 3-21: Scenario 2 - Normal P-P Plot of Regression Standardized Residual

![Normal P-P Plot of Regression Standardized Residual](image)

This is to check whether the variables are having a linear relationship or not. The probability plot in Exhibit 3-21 shows that the variables have a linear relationship.

**Significant Variables of Patient Satisfaction**

*(a) Reputation of doctor treating the patient*

Reputation of doctor treating the patient is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 4.099 and the “t-value” of 4.026 at a p-value of 0.000. The beta coefficient value is 0.253. It means ‘Reputation of doctor treating the patient’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Reputation of doctor treating the patient is positively related to Patient satisfaction. The better the Reputation of doctor treating the patient, the more satisfied the patients are with
the health care service. In fact it has emerged as the most dominant variable affecting satisfaction explaining about 50% of the total variance in satisfaction.

(b) *Speed of medical feedback through consultation*

Speed of medical feedback through consultation is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 5.790 and the "t-value" of 5.822 at a p-value of 0.000. The beta coefficient value is 0.298. It means ‘Speed of medical feedback through consultation’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Speed of medical feedback through consultation is positively related to Patient satisfaction. The faster the Speed of medical feedback through consultation, the more satisfied the patients are with the health care service.

(c) *Availability of health care provider in emergencies*

Availability of health care provider in emergencies is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 3.304 and the "t-value" of 4.753 at a p-value of 0.000. The beta coefficient value is 0.269. It means ‘Availability of health care provider in emergencies’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.
Availability of health care provider in emergencies is positively related to Patient satisfaction. The better the availability of health care provider in emergencies, the more satisfied the patients are with the health care service.

**(d) Experience level of the doctor treating the patient**

Experience level of the doctor treating the patient is one of the predictor variables. It is a Provider characteristic. It has an unstandardised coefficient value of 2.814 and the "t-value" of 2.766 at a p-value of 0.006. The beta coefficient value is 0.165. It means 'Experience level of the doctor treating the patient' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Experience level of the doctor treating the patient is positively related to Patient satisfaction. The more the Experience level of the doctor treating the patient, the more satisfied the patients are with the health care service.

**(e) Time spent in waiting room**

Time spent in waiting room is one of the predictor variables. It has an unstandardised coefficient value of -2.216 and the "t-value" of -2.721 at a p-value of 0.007. The beta coefficient value is -0.108. It means 'Time spent in waiting room' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Time spent in waiting room is negatively related to Patient satisfaction. The more the time spent in waiting room, the less satisfied the patients are with the health care service.
(f) *Number of diagnostic procedures advised*

Number of diagnostic procedures advised is one of the predictor variables. It has an unstandardised coefficient value of -1.144 and the "t-value" of -2.055 at a p-value of 0.041. The beta coefficient value is -0.082. It means ‘Number of diagnostic procedures advised’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Number of diagnostic procedures advised is negatively related to Patient satisfaction. The more the number of diagnostic procedures advised, the less satisfied the patients are with the health care service.

It is thus seen from the regression analysis in Scenario 2 – Direct channel, that the independent variable ‘Disease complexity’ does not feature in the model. The independent variable disease complexity is not statistically significant, and has no effect on the variance in satisfaction.
Scenario 3 - Low Complexity - Impersonal channel of Service delivery (Indirect Channel)

In Scenario 3, the following two questionnaires are tabulated for only those patient respondents who have given a low rating to disease complexity that is 3 and below. (Low complexity cases)

➢ The Patient Satisfaction Questionnaire is used for measuring the dependent variable “Patient Satisfaction”.

➢ The Questionnaire for Tele-Medicine Research (Indirect Channel) measures the independent variables pertaining to remote health care service.
Regression Analysis for Scenario 3

Exhibit 3-22: Scenario 3 – Table A – Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Disease Complexity</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>2</td>
<td>Usefulness of Information provided through TM</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>3</td>
<td>Experience level of doctor treating you through TM</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Patient Satisfaction Index

From the Exhibit 3-22 Scenario 3 – Table A, it is seen that three predictor variables have been entered. These are the independent variables.

➢ Disease Complexity
➢ Usefulness of Information provided through Telemedicine
➢ Experience level of the doctor treating the patient through Telemedicine

The dependent variable is Patient Satisfaction.
**Model Summary**

Exhibit 3-23: Scenario 3 – Table B – Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.559a</td>
<td>.312</td>
<td>.308</td>
<td>7.75178</td>
<td>.312</td>
<td>72.085</td>
<td>1</td>
<td>159</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>.576b</td>
<td>.331</td>
<td>.323</td>
<td>7.66535</td>
<td>.019</td>
<td>4.606</td>
<td>1</td>
<td>158</td>
<td>.033</td>
</tr>
<tr>
<td>3</td>
<td>.592c</td>
<td>.350</td>
<td>.338</td>
<td>7.58233</td>
<td>.019</td>
<td>4.479</td>
<td>1</td>
<td>157</td>
<td>.036</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Disease Complexity  

b. Predictors: (Constant), Disease Complexity, Usefulness of Information provided through TM  

c. Predictors: (Constant), Disease Complexity, Usefulness of Information provided through TM, Experience level of doctor treating you through TM  

d. Dependent Variable: Patient Satisfaction Index

It is seen from Exhibit 3-23: Scenario 3 – Table B that the R Square value is 0.35, which means the regression model explains about 35% of the total variance. In other words it means that about 35% of the variation in patient satisfaction is explained by these three independent variables in the model.
The regression model is statistically significant as may be seen from the analysis of variance table i.e. Exhibit 3-24: Scenario 3 – Table C, which indicates the p-value to be 0.000, which means the model is statistically significant at a confidence level of 99.999%.

It shows that the F-test is significant
Exhibit 3-25: Scenario 3 – Table D – Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized Coefficients</td>
</tr>
<tr>
<td></td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
</tr>
<tr>
<td></td>
<td>Disease Complexity</td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
</tr>
<tr>
<td></td>
<td>Disease Complexity</td>
</tr>
<tr>
<td></td>
<td>Usefulness of Information provided through TM</td>
</tr>
<tr>
<td>3</td>
<td>(Constant)</td>
</tr>
<tr>
<td></td>
<td>Disease Complexity</td>
</tr>
<tr>
<td></td>
<td>Usefulness of Information provided through TM</td>
</tr>
<tr>
<td></td>
<td>Experience level of doctor treating you through TM</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Patient Satisfaction Index

As seen from the Exhibit 3-25: Scenario 3 – Table D – Coefficients, the three significant predictor variables are Disease Complexity with a Beta value -6.574, Usefulness of Information provided through telemedicine with a Beta value of 1.865 and Experience level of doctor with a Beta value of 4.821.

Checking for Multi-collinearity

From Exhibit 3-25, it is seen that the Variable Inflation Factor (VIF) is close to one and tolerance values are greater than 0.2 indicating that there is no multi-collinearity with other variables.

The regression model thus is represented as follows for Scenario 3

Patient Satisfaction = 62.182 - 6.574 (Disease Complexity)

+ 1.865 (Usefulness of Information provided through telemedicine)

+ 4.821 (Experience level of doctor)

- 102 -
This equation that is obtained means that patient satisfaction will increase with the proportionate increase in the ‘Experience level of doctor’, increase in the Usefulness of Information provided through telemedicine and with a decrease in the ‘complexity of the disease’.

Checking for Normality

Exhibit 3-26: Scenario 3 - Histogram – Regression Standardized Residual

Error term should be normally distributed. Hence Histogram is drawn and a normal curve is superimposed on the histogram. The histogram in Exhibit 3-26 indicates that the error term is normally distributed.
Checking for Linearity

Exhibit 3-27: Scenario 3 - Normal P-P Plot of Regression Standardized Residual

This is to check whether the variables are having a linear relationship or not.

The probability plot in Exhibit 3-27 shows that the variables have a linear relationship

Significant Variables of Patient Satisfaction and Hypothesis Testing for Indirect channel

(a) Disease Complexity

Disease Complexity is one of the predictor variables. It is a Case characteristic. It has an unstandardized coefficient value of −6.574 and the “t-value” of −8.59 at a p-value of 0.000. The beta coefficient value is −0.553. It means ‘Disease Complexity’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Disease Complexity is negatively related to Patient satisfaction. The less complex the disease, the more satisfied the patients are with impersonal channel of service delivery.
Hence the following hypothesis

\textbf{H2 a: In High Involvement and Low Complexity situations; the effect of complexity on customer satisfaction will be negligible, when service is delivered through impersonal channel of service delivery.}

is rejected in the case of indirect channel. In fact, disease complexity has emerged as the most dominant variable affecting satisfaction explaining about 30.8% of the total variance in satisfaction

\textit{(b) Usefulness of Information provided through telemedicine}

Usefulness of Information provided through telemedicine is one of the predictor variables. It is a Provider characteristic. It has an unstandardised coefficient value of 1.865 and the “t-value” of 2.17 at a p-value of 0.031. The beta coefficient value is 0.140. It means ‘Usefulness of Information provided through telemedicine’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Usefulness of Information provided through telemedicine is positively related to Patient satisfaction. The more Useful the Information provided to the patient, the more satisfied the patients are with the health care service.
(c) Experience level of the doctor treating the patient through Telemedicine

Experience level of the doctor treating the patient through Telemedicine is one of the predictor variables. It is a Provider characteristic. It has an unstandardised coefficient value of 4.821 and the "t-value" of 2.116 at a p-value of 0.036. The beta coefficient value is 0.136. It means 'Experience level of the doctor treating the patient through Telemedicine' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Experience level of the doctor treating the patient is positively related to Patient satisfaction. The more the Experience level of the doctor treating the patient, the more satisfied the patients are with the health care service.
Scenario 4 – Low complexity -Face-to-face Health care service delivery (Direct Channel)

In Scenario 4, the following two questionnaires are tabulated for only those patient respondents who have given a low rating to disease complexity that is 3 and below (Low complexity cases)

➢ The *Patient Satisfaction Questionnaire* is used for measuring the dependent variable “*Patient Satisfaction*”.

➢ The *Questionnaire for Face-to-Face Health care Research (Direct Channel)* measures the independent variables pertaining to face-to-face health care service.
Regression Analysis for Scenario 4

Exhibit 3-28: Scenario 4 – Table A – Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Speed of Medical Feedback through Consultation</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>2</td>
<td>Reputation of doctor treating you</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>3</td>
<td>Confidence that you will avail of treatment in emergencies</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
</tbody>
</table>

* Dependent Variable: Patient Satisfaction Index

From the Exhibit 3-28 Scenario 4 – Table A, it is seen that three predictor variables have been entered. These are the independent variables.

➢ Speed of medical feedback through consultation
➢ Reputation of doctor treating the patient
➢ Confidence that one will avail of health care provider in emergencies

The dependent variable is Patient Satisfaction.
Model Summary

Exhibit 3-29: Scenario 4 – Table B – Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.664</td>
<td>.482</td>
<td>.477</td>
<td>8.18653</td>
<td>.482</td>
<td>95.816</td>
<td>1</td>
<td>103</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>.786b</td>
<td>.618</td>
<td>.611</td>
<td>7.06253</td>
<td>.156</td>
<td>36.394</td>
<td>1</td>
<td>102</td>
<td>.000</td>
</tr>
<tr>
<td>3</td>
<td>.815c</td>
<td>.664</td>
<td>.654</td>
<td>6.68155</td>
<td>.045</td>
<td>13.649</td>
<td>1</td>
<td>101</td>
<td>.000</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Speed of Medical Feedback through Consultation
b. Predictors: (Constant), Speed of Medical Feedback through Consultation, Reputation of doctor treating you
c. Predictors: (Constant), Speed of Medical Feedback through Consultation, Reputation of doctor treating you, Confidence that you will avail of treatment in emergencies
d. Dependent Variable: Patient Satisfaction Index

It is seen from Exhibit 3-29: Scenario 4 – Table B that the R Square value is 0.664, which means the regression model explains about 66% of the total variance. In other words it means that about 66% of the variation in patient satisfaction is explained by these three independent variables in the model.
Exhibit 3-30: Scenario 4 – Table C – Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>6421.523</td>
<td>1</td>
<td>6421.523</td>
<td>95.816</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>6902.992</td>
<td>103</td>
<td>67.019</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>13324.514</td>
<td>104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>8236.825</td>
<td>2</td>
<td>4118.413</td>
<td>82.568</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>5087.689</td>
<td>102</td>
<td>49.879</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>13324.514</td>
<td>104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Regression</td>
<td>8842.508</td>
<td>3</td>
<td>2947.503</td>
<td>66.421</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>4482.006</td>
<td>101</td>
<td>44.376</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>13324.514</td>
<td>104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Speed of Medical Feedback through Consultation
b. Predictors: (Constant), Speed of Medical Feedback through Consultation, Reputation of doctor treating you
c. Predictors: (Constant), Speed of Medical Feedback through Consultation, Reputation of doctor treating you, Confidence that you will avail of treatment in emergencies
d. Dependent Variable: Patient Satisfaction Index

The regression model is statistically significant as may be seen from the analysis of variance table i.e. Exhibit 3-30: Scenario 4 – Table C, which indicates the p-value to be 0.000, which means the model is statistically significant at a confidence level of 99.999%. It shows that the F-test is significant.
Exhibit 3-31: Scenario 4 – Table D – Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>19.630</td>
<td>4.968</td>
<td>3.951</td>
</tr>
<tr>
<td>Speed of Medical Feedback through Consultation</td>
<td>11.402</td>
<td>1.165</td>
<td>0.694</td>
</tr>
<tr>
<td>2 (Constant)</td>
<td>11.855</td>
<td>4.476</td>
<td>2.649</td>
</tr>
<tr>
<td>Speed of Medical Feedback through Consultation</td>
<td>7.445</td>
<td>1.200</td>
<td>0.453</td>
</tr>
<tr>
<td>Reputation of doctor treating you</td>
<td>6.916</td>
<td>1.146</td>
<td>0.441</td>
</tr>
<tr>
<td>3 (Constant)</td>
<td>13.410</td>
<td>4.242</td>
<td>3.161</td>
</tr>
<tr>
<td>Speed of Medical Feedback through Consultation</td>
<td>6.358</td>
<td>1.170</td>
<td>0.387</td>
</tr>
<tr>
<td>Reputation of doctor treating you</td>
<td>5.082</td>
<td>1.190</td>
<td>0.324</td>
</tr>
<tr>
<td>Confidence that you will avail of treatment in emergencies</td>
<td>2.994</td>
<td>0.810</td>
<td>0.268</td>
</tr>
</tbody>
</table>

As seen from the Exhibit 3-31: Scenario 4 – Table D – Coefficients, the three significant predictor variables are as follows:

➢ Speed of medical feedback through consultation with Beta value 6.358
➢ Reputation of doctor treating the patient with Beta value 5.082
➢ Confidence that one will avail of health care provider in emergencies with Beta value 2.994

**Checking for Multi-collinearity**

From Exhibit 3-31, it is seen that the Variable Inflation Factor (VIF) is close to one and tolerance values are greater than 0.2 indicating that there is no multi-collinearity with other variables.
The regression model thus is represented as follows for Scenario 4

Patient Satisfaction = 13.410 + 6.358 (Speed of medical feedback through consultation) 
+ 5.082 (Reputation of doctor) 
+ 2.994 (Confidence that one will avail of health care provider in emergencies)

This equation that is obtained means that patient satisfaction will increase with the proportionate increase in the ‘Speed of medical feedback through consultation’, ‘Reputation of doctor’ and ‘Confidence that one will avail of health care provider in emergencies’.

Checking for Normality

Exhibit 3-32: Scenario 4 - Histogram — Regression Standardized Residual

Error term should be normally distributed. Hence Histogram is drawn and a normal curve is superimposed on the histogram. The histogram in Exhibit 3-32 indicates that the error term is normally distributed

- 112 -
Checking for Linearity

Exhibit 3-33: Scenario 4 - Normal P-P Plot of Regression Standardized Residual

This is to check whether the variables are having a linear relationship or not.

The probability plot in Exhibit 3-33 shows that the variables have a linear relationship

Significant Variables of Patient Satisfaction and Hypothesis Testing for Direct channel

(a) Speed of medical feedback through consultation

Speed of medical feedback through consultation is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 6.358 and the "t-value" of 5.436 at a p-value of 0.000. The beta coefficient value is 0.387. It means 'Speed of medical feedback through consultation' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Speed of medical feedback through consultation is positively related to Patient satisfaction. The faster the Speed of medical feedback through consultation, the more satisfied the patients are with the health care service. In fact it has emerged as the most dominant variable affecting satisfaction explaining about 48% of the total variance in satisfaction.
(b) Reputation of doctor treating the patient

Reputation of doctor treating the patient is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 5.082 and the "t-value" of 4.272 at a p-value of 0.000. The beta coefficient value is 0.324. It means 'Reputation of doctor treating the patient' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Reputation of doctor treating the patient is positively related to Patient satisfaction. The better the Reputation of doctor treating the patient, the more satisfied the patients are with the health care service.

(c) Availability of health care provider in emergencies

Availability of health care provider in emergencies is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 2.994 and the "t-value" of 3.694 at a p-value of 0.000. The beta coefficient value is 0.268. It means 'Availability of health care provider in emergencies' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Availability of health care provider in emergencies is positively related to Patient satisfaction. The better the availability of health care provider in emergencies, the more satisfied the patients are with the health care service.
It is thus seen from the regression analysis in Scenario 4 – Direct channel, that the independent variable “Disease complexity” does not feature in the model. The independent variable disease complexity is not statistically significant, and has no effect on the variance in satisfaction.

Hence the following hypothesis

**H2 b: In High Involvement and Low Complexity situations; the effect of complexity on customer satisfaction will be negligible, when there is face-to-face contact between consumer and provider.**

stands proved correct and the said hypothesis is accepted as complexity does not affect satisfaction when there is face-to-face contact between consumer and provider.
Scenario 5 – High Complexity -Impersonal channel of Service delivery (Indirect Channel)

In Scenario 5, the following two questionnaires are tabulated for only those patient respondents who have given a high rating to disease complexity that is 4 and above. (High complexity cases)

➢ The Patient Satisfaction Questionnaire is used for measuring the dependent variable “Patient Satisfaction”.

➢ The Questionnaire for Tele-Medicine Research (Indirect Channel) measures the independent variables pertaining to remote health care service.
Regression Analysis for Scenario 5

Exhibit 3-34: Scenario 5 — Table A — Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Disease Complexity</td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>2</td>
<td>Education level of Patient</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Patient Satisfaction Index

From the Exhibit 3-34 Scenario 5 – Table A, it is seen that two predictor variables have been entered. These are the independent variables.

➢ Disease Complexity
➢ Education level of the patient

The dependent variable is Patient Satisfaction.
Model Summary

Exhibit 3-35: Scenario 5 – Table B – Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.61</td>
<td>.373</td>
<td>.358</td>
<td>7.60941</td>
<td>.373</td>
<td>21.995</td>
<td>1</td>
<td>37</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>.63</td>
<td>.439</td>
<td>.408</td>
<td>7.48795</td>
<td>.066</td>
<td>4.045</td>
<td>1</td>
<td>36</td>
<td>.047</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Disease Complexity
b. Predictors: (Constant), Disease Complexity, Educational level of Patient
c. Dependent Variable: Patient Satisfaction Index

It is seen from Exhibit 3-35: Scenario 5 – Table B that the R Square value is 0.439, which means the regression model explains about 44% of the total variance. In other words it means that about 44% of the variation in patient satisfaction is explained by these two independent variables in the model.

Exhibit 3-36: Scenario 5 – Table C – Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>1341.380</td>
<td>1</td>
<td>1341.380</td>
<td>21.995</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>2256.517</td>
<td>37</td>
<td>60.987</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3597.897</td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>1579.400</td>
<td>2</td>
<td>789.700</td>
<td>14.084</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>2018.498</td>
<td>36</td>
<td>56.069</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>3597.897</td>
<td>38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Disease Complexity
b. Predictors: (Constant), Disease Complexity, Educational level of Patient
c. Dependent Variable: Patient Satisfaction Index

The regression model is statistically significant as may be seen from the analysis of variance table i.e. Exhibit 3-36: Scenario 5 – Table C, which indicates the p-value to be 0.000, which means the model is statistically significant at a confidence level of 99.999%.

It shows that the F-test is significant
Exhibit 3-37: Scenario 5 – Table D – Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>115.343</td>
<td>11.432</td>
<td>10.090</td>
<td>.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Disease Complexity</td>
<td>-12.226</td>
<td>2.607</td>
<td>-.611</td>
<td>-4.690</td>
<td>.000</td>
</tr>
<tr>
<td>2 (Constant)</td>
<td>127.814</td>
<td>12.521</td>
<td>10.208</td>
<td>.000</td>
<td>.968</td>
</tr>
<tr>
<td>Disease Complexity</td>
<td>-13.161</td>
<td>2.540</td>
<td>-.657</td>
<td>-5.181</td>
<td>.000</td>
</tr>
<tr>
<td>Educational level of Patient</td>
<td>-2.372</td>
<td>1.151</td>
<td>-.261</td>
<td>-2.060</td>
<td>.047</td>
</tr>
</tbody>
</table>

*Dependent Variable: Patient Satisfaction Index

As seen from the Exhibit 3-37: Scenario 5 – Table D – Coefficients, the two significant predictor variables are Disease Complexity with a Beta value -13.161 and Education level of patient with a Beta value of -2.372.

**Checking for Multi-collinearity**

From Exhibit 3-37, it is seen that the Variable Inflation Factor (VIF) is close to one (1.033) and tolerance values are greater than 0.2 (0.968) indicating that there is no multi-collinearity with other variables.

The regression model thus is represented as follows for Scenario 5

Patient Satisfaction = 127.814 - 13.161 (Disease Complexity) - 2.372 (Education level of patient)

This equation that is obtained means that patient satisfaction will increase with the proportionate decrease in the 'complexity of the disease' and with a decrease in the 'Education level of patient'.
Checking for Normality

Exhibit 3-38: Scenario 5 - Histogram – Regression Standardized Residual

Histogram
Dependent Variable: Patient Satisfaction Index

<table>
<thead>
<tr>
<th>Regression Standardized Residual</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.75</td>
</tr>
<tr>
<td>-1.50</td>
</tr>
</tbody>
</table>

Error term should be normally distributed. Hence Histogram is drawn and a normal curve is superimposed on the histogram. The histogram in Exhibit 3-38 indicates that the error term is normally distributed.

Checking for Linearity

Exhibit 3-39: Scenario 5 - Normal P-P Plot of Regression Standardized Residual

Normal P-P Plot of Regression Stanc
Dependent Variable: Patient Satisfac

This is to check whether the variables are having a linear relationship or not.

The probability plot in Exhibit 3-39 shows that the variables have a linear relationship.
Significant Variables of Patient Satisfaction and Hypothesis Testing for Indirect channel

(a) Disease Complexity

Disease Complexity is one of the predictor variables. It is a Case characteristic. It has an unstandardized coefficient value of $-13.161$ and the "t-value" of $-5.181$ at a p-value of 0.000. The beta coefficient value is $-0.657$. It means 'Disease Complexity' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Disease Complexity is negatively related to Patient satisfaction. The more complex the disease, the less satisfied the patients are with impersonal channel of service delivery.

Hence the following hypothesis

\[ H1 \text{ a: In High Involvement situations, higher levels of complexity lead to lower levels of customer satisfaction, when service is delivered through impersonal channel of service delivery} \]

stands proved correct and the said hypothesis is accepted. In fact, disease complexity has emerged as the most dominant variable affecting satisfaction explaining about 37.3% of the total variance in satisfaction
(b) *Education level of the patient being treated*

Education level of the patient being treated is one of the predictor variables. It is a Provider characteristic. It has an unstandardised coefficient value of $-2.372$ and the "t-value" of $-2.060$ at a p-value of 0.047. The beta coefficient value is $-0.261$. It means 'Education level of the patient being treated' is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Education level of the patient being treated is negatively related to Patient satisfaction. The more the Education level of the patient being treated, the less satisfied the patients are with the health care service.
Scenario 6—High complexity -Face-to-face Health care service delivery (Direct Channel)

In Scenario 6, the following two questionnaires are tabulated for only those patient respondents who have given a high rating to disease complexity that is 4 and above (High complexity cases)

➢ The Patient Satisfaction Questionnaire is used for measuring the dependent variable "Patient Satisfaction".

➢ The Questionnaire for Face-to-Face Health care Research (Direct Channel) measures the independent variables pertaining to face-to-face health care service.
Regression Analysis for Scenario 6

Exhibit 3-40: Scenario 4 – Table A – Variables Entered/Removed

<table>
<thead>
<tr>
<th>Model</th>
<th>Variables Entered</th>
<th>Variables Removed</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Confidence that you will avail of health care provider in emergencies</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>2</td>
<td>Speed of Medical Feedback through Consultation</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>3</td>
<td>Time spent in Waiting room</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>4</td>
<td>Experience level of doctor treating you</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
<tr>
<td>5</td>
<td>Physical Environment of Clinic</td>
<td></td>
<td>Stepwise (Criteria: Probability of F-to-enter &lt;= .050, Probability of F-to-remove &gt;= .100).</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Patient Satisfaction Index

From the Exhibit 3-40 Scenario 6 – Table A, it is seen that five predictor variables have been entered. These are the independent variables.

➢ Confidence that one will avail of health care provider in emergencies

➢ Speed of medical feedback through consultation
➢ Time spent in waiting room
➢ Experience level of the doctor treating the patient
➢ Physical environment of health care centre

The dependent variable is Patient Satisfaction.

**Model Summary**

Exhibit 3-41: Scenario 6 – Table B – Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.624⁣</td>
<td>.380</td>
<td>.383</td>
<td>8.26388</td>
<td>.390</td>
<td>59.435</td>
<td>1</td>
<td>93</td>
<td>.000</td>
</tr>
<tr>
<td>2</td>
<td>.681⁣</td>
<td>.464</td>
<td>.452</td>
<td>7.78979</td>
<td>.074</td>
<td>12.859</td>
<td>1</td>
<td>92</td>
<td>.001</td>
</tr>
<tr>
<td>3</td>
<td>.712⁣</td>
<td>.507</td>
<td>.491</td>
<td>7.50952</td>
<td>.043</td>
<td>7.995</td>
<td>1</td>
<td>91</td>
<td>.008</td>
</tr>
<tr>
<td>4</td>
<td>.739⁣</td>
<td>.546</td>
<td>.526</td>
<td>7.24508</td>
<td>.039</td>
<td>7.764</td>
<td>1</td>
<td>90</td>
<td>.007</td>
</tr>
<tr>
<td>5</td>
<td>.753⁣</td>
<td>.588</td>
<td>.543</td>
<td>7.11222</td>
<td>.021</td>
<td>4.394</td>
<td>1</td>
<td>89</td>
<td>.039</td>
</tr>
</tbody>
</table>

- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies
- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies, Speed of Medical Feedback through Consultation, Time spent in Waiting room
- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies, Speed of Medical Feedback through Consultation, Time spent in Waiting room, Experience level of doctor treating you
- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies, Speed of Medical Feedback through Consultation, Time spent in Waiting room, Experience level of doctor treating you, Physical Environment of Clinic
- Dependent Variable: Patient Satisfaction Index

It is seen from Exhibit 3-41: Scenario 6 – Table B that the R Square value is 0.568, which means the regression model explains about 57% of the total variance. In other words it means that about 57% of the variation in patient satisfaction is explained by these five independent variables in the model.
### Exhibit 3-42: Scenario 6 – Table C – Analysis of Variance

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>4058.718</td>
<td>1</td>
<td>4058.718</td>
<td>59.435</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>6350.819</td>
<td>93</td>
<td>68.288</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10409.537</td>
<td>94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Regression</td>
<td>4826.901</td>
<td>2</td>
<td>2413.450</td>
<td>39.773</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>5582.636</td>
<td>92</td>
<td>60.581</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10409.537</td>
<td>94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Regression</td>
<td>5277.786</td>
<td>3</td>
<td>1759.262</td>
<td>31.197</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>5131.751</td>
<td>91</td>
<td>56.393</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10409.537</td>
<td>94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Regression</td>
<td>5685.311</td>
<td>4</td>
<td>1421.328</td>
<td>27.077</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>4724.226</td>
<td>90</td>
<td>52.491</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10409.537</td>
<td>94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Regression</td>
<td>5907.586</td>
<td>5</td>
<td>1181.517</td>
<td>23.358</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>4501.951</td>
<td>89</td>
<td>50.564</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>10409.537</td>
<td>94</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies
- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies, Speed of Medical Feedback through Consultation
- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies, Speed of Medical Feedback through Consultation, Time spent in Waiting room
- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies, Speed of Medical Feedback through Consultation, Time spent in Waiting room, Experience level of doctor treating you
- Predictors: (Constant), Confidence that you will avail of health care provider in emergencies, Speed of Medical Feedback through Consultation, Time spent in Waiting room, Experience level of doctor treating you, Physical Environment of Clinic
- Dependent Variable: Patient Satisfaction Index

The regression model is statistically significant as may be seen from the analysis of variance table i.e. Exhibit 3-42: Scenario 6 – Table C, which indicates the p-value to be 0.000, which means the model is statistically significant at a confidence level of 99.999%. It shows that the F-test is significant.
As seen from the Exhibit 3-43: Scenario 6 – Table D – Coefficients, the five significant predictor variables are as follows

- Confidence that one will avail of health care provider in emergencies with Beta value 4.968
- Speed of medical feedback through consultation with Beta value 6.287
- Time spent in waiting room with Beta value – 4.216
➢ Experience level of the doctor treating the patient with Beta value 4.180
➢ Physical environment of health care centre with Beta value 2.361

Checking for Multi-collinearity

From Exhibit 3-43, it is seen that the Variable Inflation Factor (VIF) is close to one and tolerance values are greater than 0.2 indicating that there is no multi-collinearity with other variables.

The regression model thus is represented as follows for Scenario 6

Patient Satisfaction = 10.802 + 6.287 (Speed of medical feedback through consultation) + 4.968 (Confidence that one will avail of health care provider in emergencies) − 4.216 (Time spent in waiting room) + 4.180 (Experience level of doctor) + 2.361 (Physical environment of health care centre)

This equation that is obtained means that patient satisfaction will increase with the proportionate increase in the 'Speed of medical feedback through consultation', 'Confidence that one will avail of health care provider in emergencies', 'Experience level of doctor' and 'Physical environment of health care center' and patient satisfaction will decrease with an increase in the 'Time spent in waiting room'.
Checking for Normality

Exhibit 3-44: Scenario 6 - Histogram – Regression Standardized Residual

Error term should be normally distributed. Hence Histogram is drawn and a normal curve is superimposed on the histogram. The histogram in Exhibit 3-44 indicates that the error term is normally distributed

Checking for Linearity

Exhibit 3-45: Scenario 6 - Normal P-P Plot of Regression Standardized Residual

This is to check whether the variables are having a linear relationship or not.

The probability plot in Exhibit 3-45 shows that the variables have a linear relationship
Significant Variables of Patient Satisfaction and Hypothesis Testing for Direct channel

(a) Availability of health care provider in emergencies

Availability of health care provider in emergencies is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 4.968 and the “t-value” of 4.302 at a p-value of 0.000. The beta coefficient value is 0.374. It means ‘Availability of health care provider in emergencies’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Availability of health care provider in emergencies is positively related to Patient satisfaction. The better the availability of health care provider in emergencies, the more satisfied the patients are with the health care service. In fact it has emerged as the most dominant variable affecting satisfaction explaining about 38% of the total variance in satisfaction.

(b) Speed of medical feedback through consultation

Speed of medical feedback through consultation is one of the predictor variables. It is a Provider characteristic. It has an unstandardized coefficient value of 6.287 and the “t-value” of 3.524 at a p-value of 0.001. The beta coefficient value is 0.282. It means ‘Speed of medical feedback through consultation’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.
Speed of medical feedback through consultation is positively related to Patient satisfaction. The faster the Speed of medical feedback through consultation, the more satisfied the patients are with the health care service.

(c) Time spent in waiting room

Time spent in waiting room is one of the predictor variables. It has an unstandardised coefficient value of -4.216 and the “t-value” of -3.209 at a p-value of 0.002. The beta coefficient value is -0.225. It means ‘Time spent in waiting room’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Time spent in waiting room is negatively related to Patient satisfaction. The more the time spent in waiting room, the less satisfied the patients are with the health care service.

(d) Experience level of the doctor treating the patient

Experience level of the doctor treating the patient is one of the predictor variables. It is a Provider characteristic. It has an unstandardised coefficient value of 4.180 and the “t-value” of 3.030 at a p-value of 0.003. The beta coefficient value is 0.241. It means ‘Experience level of the doctor treating the patient’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Experience level of the doctor treating the patient is positively related to Patient satisfaction. The more the Experience level of the doctor treating the patient, the more satisfied the patients are with the health care service.
(d) Physical environment of the health care centre

Physical environment of the health care centre is one of the predictor variables. It is a Provider characteristic. It has an unstandardised coefficient value of 2.361 and the "t-value" of 2.096 at a p-value of 0.039. The beta coefficient value is 0.147. It means ‘Physical environment of the health care centre’ is a significant determinant of patient satisfaction and has a strong association with satisfaction.

Physical environment of the health care centre is positively related to Patient satisfaction. The better the Physical environment of the health care centre, the more satisfied the patients are with the health care service.

It is thus seen from the regression analysis in Scenario 6 – Direct channel, that the independent variable “Disease complexity’ does not feature in the model. The independent variable disease complexity is not statistically significant, and has no effect on the variance in satisfaction.
Hence the following hypothesis is rejected,

\textit{H1 b: In High Involvement situations, higher levels of complexity lead to increased levels of customer satisfaction when service is delivered directly that is when there is face-to-face contact between consumer and provider.}

as complexity does not affect satisfaction when there is face-to-face contact between consumer and provider.

Discussions pertaining to the above findings and their implications as well as suggested directions for further research are discussed in the next chapter.