CHAPTER 3

RESEARCH METHODOLOGY

The study is qualitative and descriptive in design and the research propositions relating to the objectives of the study are stated. Methods available for collecting data and the characteristics of the sample group are set out in this chapter. The rights and safety of the participants and rules on ethics and confidentiality in collecting data are described. In addition, the variables, questionnaire design and techniques used to analyze data are stated.

3.1 RESEARCH DESIGN

Research Design is the overall plan for conducting the research in order to find out the answers for the research questions / hypotheses set in the beginning. It should be comprehensive and to include all the relevant aspects for conducting the research at a reasonable cost and time. This includes the sampling technique, the collection of data through various instruments, proper statistical tools to do the data analysis and interpreting the same. The primary data is sought through a questionnaire to answer the questions based on the relevant hypothesis.

3.2 PROPOSED RESEARCH MODEL

Proposed research model design flow is shown in Figure 3.1. It consists of three layers. First layer consists of causes and dimensions is used to find the quality of service, second layer shows patient satisfaction and third layer for identifying behavioral intention of the patient.
3.3 SOURCES OF DATA

The survey method was deployed in this study to gain insight knowledge about the perception and expectation of service quality in hospital and it influences on the behavioral intentions of the patients. The primary data of the study was collected through a structured interview schedule. The relevant secondary data was collected through journals, magazines, newspapers, research articles, published information and details from websites of the software companies taken for study.
3.4 POPULATION OF THE STUDY

The study is confined to Madurai, Theni, Dindigul and Tirunelveli Districts in Tamilnadu. Selected district in Tamilnadu map is shown in Figure 3.2.

![Figure 3.2 Selected Districts](image-url)

3.5 SELECTION OF RESPONDENTS

In Tamilnadu, there are thirty two districts are present, nine districts are in Southern part of Tamilnadu namely Kanyakumari, Tuticorin, Tirunelveli, Ramanathapuram, Dindigul, Madurai, Theni, Sivagangai, Ramanathapuram. The study concentrates on four select districts specifically Madurai, Theni, Tirunelveli, Dindigul. The above districts are facilitated with both government and private hospitals. so it represents the good section of respondents belonging to different health care sector (allopathic), the respondents who are belongs to the above mention districts were taken for the study. In the selected districts the District Head Quarter Public hospitals and more than 50 beds private hospitals are taken for my study. Both government and private hospitals were approached and requested in filling up the interview schedule, 481 patients to be surveyed, out of which 250 sample are from government and 231 from private inpatients were taken as respondents,
irrespective of their age, educational qualifications, occupation, monthly income, each of the research subjects responded to a questions on demographical details and other variables related to study.

3.6  SAMPLING DESIGN

It is the theoretical basis and the practical data are collected so that the characteristics of a population can be inferred with known estimates of error. The following subdivisions explain the sampling design of this thesis.

3.6.1  Sampling Technique

The researcher has used systematic random sampling to select the respondents. The process of systematic sampling typically involves first selecting a fixed starting point in the larger population and then obtaining subsequent observations by using a constant interval between samples taken. In all the hospitals included in the study, the total number of potential sample is 1783. The number of desired sample is 481. (1783/481) gives an n of 3.7, that is , 4.

3.6.2  Sample Size

The total number of respondents for this study was estimated scientifically using the formula $n=(S*Z/e)^2$ for an undisclosed large population size. Initially, a pilot study was done by studying 60 patients selected from leading hospitals in the study area. The sample size of 481 respondents to be surveyed in case of an undisclosed population size and the calculation for scientific estimation of population size is as follows.

$$n = (0.56 *1.96/.05)^2 = 481$$ patients to be surveyed. 250 sample of government and 231 private inpatients were taken as respondents.
3.6.3 Data Collection

Statistical investigation requires systematic collection of data. The data is collected by the researcher through the following sources.

- **Primary Data:** Interview schedule was administered in person by the researcher to elicit primary data.

- **Secondary Data:** The following were the sources of secondary data through which the researcher collected the data.
  - Books
  - Journals
  - Newspapers / Magazines
  - Publications
  - Websites.
  - Hospital information records

3.6.4 Instrument for Data Collection

An Interview schedule was administered to collect the primary data. The Likert’s 5 point scale method was found suitable for the study, as it has a good viability and most importantly it is easy for the respondents of varying educational level to understand and respond. This is also the most widely used method among the researchers and easy to construct. The instrument used in this study is self – administered schedule for collecting primary data. The schedule consists of four sections: Section 1 of the instrument is intended to collect the demographic information of the respondents. Section 2 of the instrument is intended to know the category of
the hospital for the treatment. Section 3 of the instrument is intended to know the necessary and sufficient expectations of the patients and perceptions of the hospital services provided by the hospital management with respect to SERVQUAL items SIW, (SERVQUAL Importance Weights). Five dimensions in SERVQUAL are Tangible(1-4), Reliability(5-9), Responsiveness (10-13), Assurance (14-17), Empathy (18-22) and over all service quality (average of all factors), patients’ satisfaction. Section 4 of the instrument is intended to focus on collection of the behavioral index of the respondents by 4 factors namely , word of mouth(1-4), positive problem response (5-7), non-switching to competitor(8-11) and willingness to pay more(12-13).

Data is collected from the in-patients of the selected allopathic hospitals located at southern districts of Tamil nadu namely Dindigul, Madurai, Theni and Tirunelveli. Methodology for measuring service quality using SERVQUAL: Measuring the quality of a service can be difficult exercise. Unlike product where there are specific specifications such as length, depth , width, weight, colour etc. a service can have numerous intangible or qualitative specifications. In addition there is a expectation of the customer with regards the service, which can vary considerably based on a range of factors such as prior experience, personal needs and what other people may have told them. As a way of trying to measure service quality, researchers have developed a methodology known as SERVQUAL- a perceived service quality questionnaire survey methodology. SERVQUAL examines the dimensions of service quality such as tangibility, reliability, responsiveness, assurance and empathy. For each dimension of service quality above SERVQUAL measures both the expectation and perception of the service on a scale 1 to 5, 22 questions in total. Then, each of the five dimensions are weighted according to customer importance , and the score for each dimension multiplied by the weighting. Following this, Gap Score
for each dimension is calculated by subtracting the expectation score from the perception score. A negative Gap score indicates that the actual service of perceived score is less than expected score. The Gap score is a reliable indication of each of five dimensions of service quality. Using SERVQUAL, service provider can obtain an indication of the level of quality service provision, and highlight areas requiring for improvement. Outline below are the instructions carrying out a SERVQUAL survey and a sample of the questions used in the questionnaire. In this sample, a hospital is surveyed however; any service organization can be surveyed using this questionnaire. Gap score is obtained by using the following steps.

Step 1: To find the gap between perception and expectation of service quality of hospital by using the formula for all 22 items in the SERVQUAL. GAP score = P - E where P - Perception, E - Expectations.

Step 2: Find the average gap for five dimension. Tangible(1-4), Reliability(5-9), Responsiveness (10-13), Assurance(14-17), Empathy (18-22) and over all service quality (average of all factors).

Step 3: SERVQUAL weight for all factors are calculated from Section 3 of interview schedule.

Step 4: The weighted score for each factor is calculated by

Weighted Score = Average Score for each factor X Weighted Score for each items.

Hence the obtained weighted SERVQUAL score of service quality for hospital are being measured.
3.6.5 **Reliability**

This study observes only the internal consistency because the study asked for a score from each respondent toward a statement. Internal consistency is estimated using a reliability coefficient called Cronbach's alpha. An alpha value of 0.60 and 0.70 or above is considered to be the criteria for demonstrating internal consistency of new scales and established scales respectively.

3.6.6 **Instrument Reliability**

Name of the variable and item selection for testing the quality by SERVQUAL is listed in Table 3.1.

**Table 3.1 Variable used to measure the service quality**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the Variable</th>
<th>No. of Items</th>
<th>Cronbach's Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Expectations – Service Quality Dimensions</td>
<td>22</td>
<td>0.930</td>
</tr>
<tr>
<td>2</td>
<td>Perception– Service Quality Dimensions</td>
<td>22</td>
<td>0.907</td>
</tr>
<tr>
<td>3</td>
<td>Behavioral Intention</td>
<td>13</td>
<td>0.792</td>
</tr>
</tbody>
</table>

3.6.7 **Tools Used for of Analysis**

Statistical Package for Social Sciences (SPSS) version 18.0 is used for analyzing by the following test.

- Frequency, Percentage distribution and Mean & SD
- Independent sample t test
- ANOVA followed by Duncan Multiple Range Test (DMRT)
- Chi square test
• Paired sample t test

• Correlation Analysis

• Multiple Regression Analysis is used to study the functional relationship between dependent variable and the linear combination of the other variable.

• Structural Equation modeling (SEM) is used in this research for data analysis. SPSS – AMOS version 18.0 is used for analyzing SEM model.

3.6.7.1 t _Test

The t-test is the most commonly used method to evaluate the differences in means between two groups. In this study, the t test is used to find the difference between genders with reference to various factors of level of expectation and level of satisfaction.

3.6.7.2 ANOVA

Analysis of variance is used to compare means and variability of more than two groups. In this study, the ANOVA is used to find the difference between age, educational qualifications, occupations, monthly income, with respect to various factors of Service Quality.

3.6.7.3 Bivariate correlations

Bivariate analysis is one of the simplest forms of the quantitative (statistical) analysis. It involves the analysis of two variables (often denoted as X, Y), for the purpose of determining the empirical relationship between them. In order to see if the variables are related to one another, it is common to measure how those two variables simultaneously change together. Bivariate
analysis can be helpful in testing simple hypotheses of association and causality – checking to what extent it becomes easier to know and predict a value for the dependent variable if we know a case's value on the independent variable. Bivariate analysis can be contrasted with univariate analysis in which only one variable is analysed. Furthermore, the purpose of a univariate analysis is descriptive. Subgroup comparison – the descriptive analysis of two variables – can be sometimes seen as a very simple form of bivariate analysis (or as univariate analysis extended to two variables). The major differentiating point between univariate and bivariate analysis, in addition to looking at more than one variable, is that the purpose of a bivariate analysis goes beyond simply descriptive: it is the analysis of the relationship between the two variables.

3.6.7.4 Multiple regression analysis

Regression is the determination of statistical relationship between two or more variables. In simple regression two variables are used. One variable (independent) is the cause of the behaviour of another one (dependent). When there are more than two independent variables the analysis concerning relationship is known as multiple correlations and the equation describing such relationship is called as the multiple regression equation.

Regression analysis is concerned with the derivation of an appropriate mathematical expression is derived for finding values of a dependent variable on the basis of independent variable. It is thus designed to examine the relationship of a variable \( Y \) to a set of other variables \( X_1, X_2, X_3 \ldots \ldots \ldots X_n \). The most commonly used linear equation in \( Y=b_1 X_1 + b_2 X_2 + \ldots + b_n X_n + b_0 \)
Here Y is the dependent variable, which is to be found. $X_1, X_2, \ldots$ and $X_n$ are the known variables with which predictions are to be made and $b_1, b_2, \ldots b_n$ are coefficient of the variables.

3.6.7.5 **Structural Equation Modeling**

Structural equation modeling (SEM) is a statistical technique for testing and estimating causal relations using a combination of statistical data and qualitative causal assumptions. Structural Equation Models (SEM) allow both confirmatory and exploratory modelling, meaning they are suited to both theory testing and theory development. Confirmatory modeling usually starts out with a hypothesis that gets represented in a causal model. The concepts used in the model must then be operational to allow testing of the relationships between the concepts in the model. The model is tested against the obtained measurement data to determine how well the model fits the data. The causal assumptions embedded in the model often have falsifiable implications which can be tested against the data. Modeling is done based on the factor reduction in the level of satisfaction by principle component analysis (PCA). A proposed model will be done using the structural equation modeling to attain satisfaction level in corporate governance.

3.7 **HYPOTHESIS OF THE STUDY**

A hypothesis is an assumption to be tested. The statistical testing of hypothesis is the most important technique in statistical inference. Hypothesis tests are widely used in business and industry for making decisions. It is here that probability and sampling theory plays an ever-increasing role in constructing the criteria on which business decisions are made.

**Objective 1:** To find out the demographic factors with regard to service quality of hospitals.
H1: There is no significant difference between Male and Female with respect to Factors of Service Quality and Behavioural Intention of Patients

H2: There is no significant difference between Married and Unmarried with respect to Factors of Service Quality and Behavioral Intention of Patients

H3: There is no significant difference between government and private hospitals with respect to Factors of Service Quality and Behavioural Intention of Patients

H4: There is no significant difference between joint and nuclear family with respect to Factors of Service Quality and Behavioural Intention of Patients

H5: There is no significant difference between health insurance covered and not covered with respect to Factors of Service Quality and Behavioural Intention of Patients

H6: There is no significant difference between CM health insurance covered and not covered with respect to Factors of Service Quality and Behavioural Intention of Patients

H7: There is no significant difference among age group with respect to Factors of Service Quality and Behavioural Intention of Patients

H8: There is no significant difference among educational qualification group with respect to Factors of Service Quality and Behavioural Intention of Patients
H9: There is no significant difference among Occupational group with respect to Factors of Service Quality and Behavioural Intention of Patients

H10: There is no significant difference among monthly income of family group with respect to Factors of Service Quality and Behavioural Intention of Patients

H11: There is no significant difference among number of days stay in Hospital with respect to Factors of Service Quality and Behavioural Intention of Patients

H12: There is no significant difference between Monthly Expenditure on health services with respect to Factors of Service Quality and Behavioural Intention of Patients.

H13: There is no significant difference between Name of insurance with respect to Factors of Service Quality and Behavioural Intention of Patients

H14: There is no significant difference between Place with respect to Factors of Service Quality and Behavioural Intention of Patients

H15: There is no association between male and female and level of satisfaction on service quality of patients

H16: There is no association between age group in years and level of satisfaction on Service quality of patients.

H17: There is no association between age group in years and level of satisfaction on Service quality of patients.

H18: There is no association between Marital Status and level of satisfaction on service quality of patients
H19: There is no association between Occupation and level of satisfaction on service quality of patients

H20: There is no association between Monthly income of family and level of satisfaction on service quality of patients

H21: There is no association between Ownership of Hospital and level of satisfaction on service quality of patients

H22: There is no association between Number of days in hospital and level of satisfaction on service quality of patients

H23: There is no association between place of hospital and level of satisfaction on Service quality of patients

H24: There is no association between Average arrival time from the source and level of Satisfaction on service quality of patients

H25: There is no association between nature of family and level of satisfaction on Service quality of patients

H26: There is no association between monthly expenditure on health service and level of Satisfaction on service quality of patients.

H27: There is no association between health insurance covered and level of satisfaction on service quality of patients

H28: There is no association between health insurance covered and level of satisfaction on service quality of patients

H29: There is no association between CM health insurance and level of satisfaction on Service quality of patients

H30: There is no significant difference among mean ranks toward factors of service quality with respect to hospital industry.
Objective 2: To determine the service quality factors differentiating public and private hospitals.

Objective 3: To identify the most influencing service quality factors for each of the hospitals.

Objective 4: To determine the factors in relation to patients’ satisfaction in hospitals.

Objective 5: To develop a structural equation model to measure patients’ expected and perceived service quality.

3.8 CONCEPT OF P-VALUE

Given the observed data set, the P value is the smallest level for which the null hypothesis is rejected (and the alternative is accepted)

- If the P value \( \leq \alpha \) then reject \( H_0 \); Otherwise accept \( H_0 \)
- If the P value \( \leq 0.01 \) then reject \( H_0 \) at 1% level of significance
- If the P value lies between 0.01 to 0.05 (i.e. \( 0.01 < P \text{ value} \leq 0.05 \)) then reject \( H_0 \) at 5% level of significance
- If the P value \( > 0.05 \) then accept \( H_0 \) at 5% level of significance
- To fit the data to the nearest distribution which represents the data more meaningfully for future analysis? Such fitting of data to the nearest distribution is done using the goodness of fit test

- \( H_0 \): The given data follow an assumed distribution
- \( H_1 \): The given data do not follow an assumed distribution.