Chapter IV

RESEARCH METHODOLOGY

4.1 Overview

This chapter explains the methodology adopted in this research and the reasons for having chosen them is given in detail. The nature of the research and the variables involved therein are highlighted in this chapter. The research design adopted and also the methods used in this research are listed. Sample selection and its justification have been given. The research instruments used and the procedure of developing them have listed. The systematic procedure for performing reliability, validity and practicality test has been described. The data collection process is explained in detail. Organizational profile has also been given. The statistical procedures used for data analysis is briefed and the limitations of these methods are also discussed.

4.2 Research Approach

Mixed methods was the research approach adopted in this research. Mixed methods research i.e., the combined use of quantitative and qualitative methods in the same study is becoming an increasingly popular approach in the discipline fields of business management, sociology, psychology, education and health sciences. The integration of quantitative and qualitative research methods may provide a better understanding of research problems and complex phenomena than either approach alone (Azorín & Cameron, 2010). In the present study both primary and secondary data were collected. While the former was used for both qualitative and quantitative analysis, the latter was used for qualitative analysis only. The quantitative analysis was basically for the empirical study and was done in
the form of hypothesis testing. Qualitative analysis was restricted to the interpretation of the qualitative part of the questionnaire, semi structured interviews and the evidence collected through the meta-analysis of the literature. The quantitative analysis included two components viz., descriptive statistics and inferential statistics. The descriptive statistics was used to describe the general pattern and nature of the data, the latter was used to draw inferences so as to arrive at specific conclusions of the study. Descriptive statistics dealt with the mean, standard deviation, Skewness and Kurtosis, percentage calculations, perception study of the respondents on the dimensions of the various constructs under study. The inferential study was mainly through the Structural Equation Modeling (SEM) using PLSM.

4.3 Type of research and the variables

This is basically a causation based empirical research, where working hypotheses were stated initially and then data was collected to prove or disprove these hypotheses. Thus the evidence gathered through the empirical studies support the given hypotheses and from the study results of which inferences were derived and implications were drawn. This kind of empirical research is appropriate when proof is sought after that certain variables affect other variables in some way. The following were the exogenous and the endogenous variables of the study.

4.3.1 Exogenous variable

**Total Quality Management Practices (TQM):** This is a construct with eight dimensions: Top management leadership (TML), Customer management (CMT), Supplier quality management (SQM), Continuous improvement (CNI), People Management (PMT), Process management (PRM), Quality information management (QIM), and Organizational learning (ORL).
Thus,

\[ TQM = f(TML, CMT, SQM, CNI, PMT, PRM, QIM, ORL) \] \[1\]

4.3.2 Endogenous variables

There were two endogenous variables in this study.

1. **Competitive Advantage (CMA):** This is a construct which has two dimensions: Product Differentiation (PRD) and Cost Leadership (CSL).

Thus,

\[ CMA = f(PRD, CSL) \] \[2\]

2. **Business Performance (BNP):** This construct has three dimensions: Operational Performance (OPP), Financial Performance (FNP), and Non-financial Performance (NFP).

Thus,

\[ BNP = f(OPP, FNP, NFP) \] \[3\]

4.4 Research Design

The research design was chosen in accordance to the nature of the research. It is a non-experimental hypothesis testing research which involved experimentation with the independent variables (TQM). Since the investigator had no control over the independent variables, and hence, the researcher could not manipulate the independent variables at her will and study the influences, instead a metric in the form of a Likert 5-point scale was used to collect the data on an ordinal scale. The data was then subjected to the statistical tests such as t-test and the second generation statistical technique - Structural Equation Modeling (SEM) to test the hypotheses which had been formulated to answer the research questions.
4.5 Sampling Design

The purpose of this research was to study in depth the issues related to TQM implementation in hospitals, which is in its nascent state, and establish an empirical evidence for the link between TQM and endogenous variables of research interest (CMA and BNP). Therefore it was necessary to consider a cross section of hospitals so both private and public sectors were considered for sample selection in this research. The respondents chosen were the employees of these selected hospitals.

Population

All the public and private hospitals in Kottayam district where TQM is implemented or being implemented, constituted the study population.

Sampling Frame

Directorate of Health Services (DHS) Thiruvananthapuram, had provided the list of both the private and public sector hospitals in the district and from which the sample hospitals were chosen.

Identification of the sample and Rationale for its selection

Probability sampling technique, both simple random sampling and stratified random sampling techniques were used to draw the required samples for the detailed research. Accordingly all the hospitals that conform to the tenets of TQM were identified and these entities were stratified into public and private hospitals. The private hospitals included both for profit and not for profit organizations. And then simple random sampling was used to select the sample hospitals from these two segments. The respondents chosen were the top and the middle level manager’s category working in these selected hospitals. The respondents included Medical Superintendents/Medical Officers, Administrators/Directors, Public Relations Officers, Lay
Secretaries and personnel in-charge of various departments such as Medical, Dental, Nursing, Pharmacy, Clinical laboratory, Radiology, Physiotherapy Speech therapy, Dietary, Maintenance, Pastoral care, Accounts and other allied health departments in the hospital. Even though there were strata of employees in each of the service sector chosen since their stratification had no relevance to this study which is at macro level of analysis seeking relationships between constructs and their individual dimensions. Hence employee stratification was not considered in this study. Thus the sample was randomized across the departments and the two sectors considered, cover the hospital industry in the state.

The first rationale for the selection of the two service sectors in the hospital industry is their collective representation of the service sectors of the country in general and state in India in particular. The second rationale is the diversification of the hospitals in terms of management from public to private and profit based as well as non-profit based organizations. The third rationale is the distribution in terms of the infrastructure of the hospitals and their geographical locations. The rationale for choosing the particular class of employees in these two sectors lies in their ability to provide the data and information with references to the constructs of the study. Thus sampling frame and the unit of analysis (employees of hospitals) truly meets the requirements of the study.

Sample Size

This research adopted the SEM analysis in which sample size is not an issue as long as the minimum sample size criterion of above 200 is satisfied. However, to be sure of the minimum sample size, the approach of specifying the precision of estimation desired first, and then determining the sample size necessary to ensure it (Kothari, 2000) was adopted, according to which, the
sample size necessary was about 196, however to get a better sample
distribution the sample size chosen was 304.

The sample size estimation is based on the 2% defect in sample
(based on pilot study) and an acceptable error of 2%. Again, the optimum
size of the sample in a social research is based on the nature of the empirical
study, time and resources available, and various other considerations such as
size of questionnaire, size of universe etc. In practice, the complexity of the
competing factors of resources and accuracy means that the decision
regarding a sample size tends to be based on experience and good judgment,
rather than relying on a strict mathematical formula (Creswell, 2008). Also
the use of surveys in social research does not necessarily have to involve
samples of 1000 or 2000 people or events. Instead, research involving a
number between 30 and 250 cases is adequate (Denscombe, 1999).

Thus the Sample size was estimated by using the formula

\[ d^2 = 4pq/n, \]

Where,

- \( p \) - proportion of success.
- \( d \) - Sampling error
- \( q = 1-p \)

In the present study \( p=0.98 \)  (Based on pilot study)

\( q =1-0.98= 0.02 \)

\( d =0.02 \) (Based on pilot study)

Therefore,

\[ (0.02)^2 = 4 \times 0.98 \times 0.02/n \]

\[ n = 4 \times 0.98 \times 0.02/0.0004 \]

\[ n=196 \]
For SEM analysis according to the principles, a minimum sample size of 200 is required. In the present study better distribution of sample is ensured by fixing the sample size to 304.

**Thus the Sample Size (n) for the present study**

No. of Hospitals: 10 (6 private and 4 public hospitals)

No. of respondents: 304 (213 from private and 91 from public hospitals)

### 4.6 Tools used for data collection

Self-Administered Questionnaire

Semi structured interview

#### 4.6.1 Self-Administered Questionnaire

A self-administered questionnaire was the metric used for data collection in this research. The reason for choosing this instrument was that it is a relatively systematic and standardized method of collecting data, which lays emphasis on measurement and conversion of data from qualitative to quantitative form. Further, this method is considered to be economical and convenient for this kind of research.

The questionnaires were designed to study the perceptions of the respondents on the research issues. They obtained the answers to the research questions and provided the necessary data to test various hypotheses. Though the literature review and interviews with the knowledge workers in the academia and hospitals identified several dimensions and their indicators, only those areas most relevant to the research questions of this study were selectively chosen. Further, while developing the questionnaire the following points were taken into consideration:
• Are the respondents from the cross-section of the hospital competent enough to provide the necessary information?

• Do the chosen indicators of each dimension truly measure what actually they are intended to measure?

Care was taken to see that the questions were uniformly understood by all respondents belonging to different service sectors. Trial run was made to confirm whether the respondents were familiar with the terms used in the instrument. Also during the initial trial run, the questionnaires were reviewed for problems with bias and it was confirmed that no particular question caused any problem of understanding. Simple language was used throughout the questionnaire and all possible ambiguity was eliminated. Glossary of difficult terms was also included in the questionnaire for better understanding. Moreover, it was ensured that all the questions were effective in obtaining information relevant to hypothesis testing in all the cases and eliciting the information that was required.

The questionnaire had three distinct parts: The first part on the demographic details of the respondents; the second part had questions related to the constructs – TQM, CMA and BNP to collect the quantitative data; and the third part had qualitative component in which their opinions, suggestions and general perceptions were solicited in qualitative form. The quantitative part of the questionnaire used a five-point Likert-type ordinal scale, measuring the degree to which the respondents believed the statements in the questionnaire to be true, the highest being ‘strongly agree’ and the least being ‘strongly disagree’. Questionnaires were delivered directly to the respondents and the responses were obtained, and this was found to be helpful in obtaining higher response rate.
4.6.1.1 Development of the Questionnaire

The development of the questionnaire was through the standard method of meta-analysis of the literature on the construct. There were three different components in the questionnaire and each one of them is dealt separately in the following sections.

4.6.1.1 Total Quality Management (TQM)

TQM practices are in practice since several decades and researchers have identified several dimensions which describe this construct as a whole. The choice of the most appropriate dimensions among the available dimensions has been a matter of choice of the researchers, but to a great extent it is found to be context specific. In the context of hospitals, through the meta-analysis following dimensions were chosen (Table 4.1).

Table 4.1: The Dimension, Meaning, Literature Support, and the Sample Item - TQM

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Meaning</th>
<th>Literature</th>
<th>Sample Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Management</td>
<td>Maintaining close contact with customers and building relationships to</td>
<td>Zairi (2000), Rampersad (2001), Dayton (2003), Yang (2005), Fotopoulos &amp; Psomas (2009).</td>
<td>Surveys are conducted periodically to identify the customers’</td>
</tr>
<tr>
<td>Category</td>
<td>Description</td>
<td>References</td>
<td>Notes</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Continuous Improvement</td>
<td>Maintaining close contact with suppliers and building relationships with them. Continuously taking feedback, to make sure they deliver the right goods in right quantity with the right quality.</td>
<td>Baxter et al., (1989), Carter &amp; Ellram (1994), Guido &amp; Micheli (2008), Johnsen (2011)</td>
<td>Quality is considered as prime criteria in supplier selection.</td>
</tr>
<tr>
<td></td>
<td>Managing the human resources through efficient training, quality consciousness, team building etc., and having all the processes such as appraisal, training</td>
<td>Tata &amp; Prasad (1998), Yusof &amp; Aspinwall (2000), Rahman (2001), Dayton (2003), Karia &amp; Asaari (2006), Harrington et al. (2012), Dibia et al.</td>
<td>Organization encourages employees to fix quality problems.</td>
</tr>
<tr>
<td>Process Management</td>
<td>Applying the principles of management so that the processes in the organization are under control through clear instructions, constant monitoring, inspection, and standardization.</td>
<td>Yong &amp; Wilkinson (1999), Gonzalez &amp; Guillen (2002), Brah &amp; Lim (2006), Demirbag et al. (2007), Sharma &amp; Kodali (2008), Khanna et al. (2011)</td>
<td>Key processes in the organization are regularly benchmarked and undergo quality auditing.</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
4.6.1.2 Competitive Advantage

Competitive advantage is an advantage gained over competitors by offering customers greater value for money, either through lower prices or by providing additional benefits and service that justify similar, or possibly higher, and prices (Porter, 2009). The gaining of the competitive advantage is mainly measured by the product differentiation, cost leadership, and superior performance. In the context of this research as Business Performance itself was of specific interest of study and it is dealt separately. For these dimensions the meaning, literature support, and the sample item are given in table 4.2.

Table 4.2: The Dimension, Meaning, Literature Support, and the Sample Item - CMA

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Meaning</th>
<th>Literature</th>
<th>Sample item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost leadership</td>
<td>It is aggressive construction of efficient-scale facilities, vigorous pursuit of cost reductions from experience, tight cost and overhead control, avoidance of marginal customer accounts, and cost minimization in areas like R&amp;D, service, sales force, advertising, and so on</td>
<td>Porter (1985), Davidson (2004), Powers &amp; Hahn (2004), Baack &amp; Boggs (2008), Collins &amp; Winrow (2010), Abdullah (2013).</td>
<td>We take effort to lower cost of services than competitors.</td>
</tr>
</tbody>
</table>
4.6.1.1.3 Business Performance (BNP)

There are several measures of performance of an organization and it varies from tangibles to intangibles and from financial to non-financial measures. However, the meta-analysis of the literature yielded some key measures of performance of an organization which are given in the table 4.3.

**Table 4.3: The Dimension, Meaning, Literature Support, and the Sample Item - BNP**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Meaning</th>
<th>Literature</th>
<th>Sample Item</th>
</tr>
</thead>
</table>
Thus, with the above literature support and the standard indicators of measuring the individual dimensions, a metric was developed composed with 90 items in total. There were three constructs in this research: TQM implementation, Competitive Advantage (CMA), and Business Performance (BNP). The metric had the following number of indicators under the dimensions in the three constructs: 11 – TML and PMT; 5 - CMT, CNI, OPP; 6 - SQM, PRM, ORL; 7 - QIM, PRD; 9 - CSL, 4 - FNP; 8 - NFP. However, these indicators were reduced through Confirmatory factor analysis by conducting a pilot study, and post the trial run minor changes were made after consulting the experts in the field (4 subject experts and 3 senior employees of hospitals), during the validation of the questionnaire through the standard procedure. Exploratory Factor Analysis was not necessary in this research as the dimensions of the construct already had proved validity and the data collected by earlier researchers had proved reliability (Jacobs & Kleiner, 1995; Salaheldin, 2009; Singh, 2011; Newbert, 2014).

4.6.2 Semi-Structured Interview

The primary data for qualitative analysis was collected using the Semi-structured Interview Protocol (Appendix 3). The content of the semi-structured interviews was vetted through four subject experts and the relevance of each of the questions was validated for suitability and acceptability. The purpose of the semi-structured interviews was twofold. The first was to justify if the empirical findings and the hypothesis testing were practically true and justifiable. The second purpose was to gain insights into the issues related to TQM implementation in the form of challenges and the way the organization had tackled some difficult situations in terms of the TQM practices. Hence the interview protocol included questions related to these mentioned topics.
4.7 **Reliability, Validity and Practicality of the Metric**

Sound measurement must meet the tests of Reliability, Validity and Practicality. These are the three major considerations used in a research, which involves data collection through instruments such as questionnaires (Kothari, 2000). In this research, a pilot study was conducted for a sample size of 30 across the two sectors with an intention to check the instrument for the reliability, validity, and practicality. The Alpha Chronbach’s reliability, Composite reliability, average variance extracted, communality, redundancy, inter-item correlation and factor loadings were tested. The results are given in Appendix 4.

4.7.1 **Reliability**

‘Reliability’ has to do with the accuracy and precision of measurement procedure (Litwin, 1995). A reliable instrument should give identical responses if the questionnaire is served two or more times. The most common approach of estimating the reliability of an instrument that is presented to respondents only once is ‘split-half reliability’. In this approach the test is split into two equivalent halves and the scores for respondents on one half are correlated with those scores on the second half of the test. The difficulty in this approach is determining whether the two halves are equivalent. Cronbach proposed the coefficient ‘alpha’ (called Cronbach’s Alpha), which may be considered as the mean of all possible split-half coefficients. A test with ‘robust’ reliability would be expected to display a Cronbach’s Alpha in excess of 0.9. However, values above 0.7 are usually acceptable indicators of internal consistency as suggested in the literature (Santos, 1999; SPSS, 2000; Straub, Boudreau & Gefen, 2004). In this research the higher value of Cronbach’s Alpha (>0.6) justified the internal consistency of the items.
4.7.2 Validity

‘Validity’ refers to the extent to which a test measures what we wish to measure. Even though validity to a great extent is judgmental, three types of validity have been defined: content, criterion and construct validity. The instrument used in this research had been subjected to content and criterion related validity, as the dimensions were derivatives of standard instruments used before in different organizations. However, in this research they were used in a hospital, so the content validity was checked again for suitability to this sector. The language of the questionnaire was revised wherever necessary to make the questionnaire more precise and understandable.

Content Validity: Having successfully conducted these validation steps as explained in the previous section, the content validity of the measurement model was analyzed and was established. In this context, content validity refers to the degree to which items in an instrument reflect the content universe to which the instrument will be generalized. Generally, content validity is not easy to assess, since the commonly employed evaluation of this validity is judgmental and highly subjective (Straub et al., 2004). The content validity was further established through adoption of the instruments validated by other researchers listed in the metric development section.

Construct Validity: Construct validity assesses whether the scales are measuring what they are designed to measure. The questionnaire was given to a group of 4 academicians 3 knowledge workers in the hospital and their opinion on its ability to measure what it intended to measure was collected. They were asked to assess the understandability, readability and suitability of the instrument. As the response was positive except some minor modifications the construct validity was ascertained.
Convergent and Discriminant Validity:

These are commonly regarded as subset of construct validity. The basic difference between convergent and discriminant validity is that convergent validity tests whether constructs that should be related, are related. Discriminant validity tests whether believed unrelated constructs are, in fact, unrelated. Both convergent and discriminant validity can be computed by using simple correlations or multiple/hierarchical regressions. In the present study the AVE values for all reflective constructs were tested to be greater than the minimum recommended value of 0.40. Further the square root of AVE for each construct in the model, as reported in the diagonal of the correlation of constructs matrix was larger than the corresponding off-diagonal correlations of the construct to their latent variables. These two measures ensured the convergent and discriminant validity of the questionnaire.

4.7.3 Practicality

‘Practicality’ of a measuring instrument is judged in terms of economy, convenience and interpretability. Economy consideration of practicality suggests that some trade-off is needed between the ideal research project and that which the budget can afford. The length of the questionnaire is an important area where economic pressure is felt. More items in a questionnaire will give greater reliability (Kothari, 2000) but this is time consuming and tedious. This was one of the reasons for retaining a maximum of 39 questions in the questionnaire taking care to give a maximum coverage of the study topic. “Convenience” forms another key factor of practicality. The questionnaire was designed to be self-administrative in nature and clear guidelines were given in the instrument itself, so that there would be minimum number of queries regarding how it has to be filled. The Likert
scale scoring keys were stated in the beginning and separate columns were provided for clicking on the responses, under each category. Interpretability of the items was given enough importance to see that each question gives only one meaning, free from ambiguity.

Thus with a fair degree of certainty the instrument was tested for the reliability and validity so as to ensure that it measured what it was expected to measure and the data collected through the metric was reliable to the given degree of requirement.

4.8 Data collection

Questionnaire and interview were the two methods used for data collection in this research. Thus both the quantitative and qualitative data were collected. The data was collected from the selected public and private hospitals and the top and the middle managers were the respondents. The following paragraphs present a brief summary of the profile of the selected hospitals as well as the data collection process in detail.

4.8.1 Organization profile

This research was oriented towards the study of the impact of TQM implementation on the gaining of the competitive advantage in the market and the improvement in the business performance of the selected hospitals in the private and public sectors in the state. A brief mention about these service sectors is as follows.

Private Hospital Sector

The private health sector dominates the public sector in Kerala. The private health care in Kerala is rapidly emerging and the current boom began in the 1980s and has been attributed to rising levels of education, increase in disposable incomes and greater health consciousness among Keralites. An
ageing population also led to more and more people seeking quality health care. In addition, government regulations were also considerably eased in order to help the growth of this sector. As a result today, there is a mushrooming of private hospitals in the state that offer quality services matching international standards. The private hospital include both for-profit and not for profit institutions. In this research the researcher had collected data from 6 private institutions. The permission for data collection was obtained from the top management of the concerned hospitals. Data and information collection was permitted with a written undertaking that no mention of the name of the hospital will be made in any form and hence the confidentiality has been maintained. However, the detailed explanation of the infrastructure has been given for the sake of understanding of the status of the hospital.

Hospital - 1

It is a multi-specialty hospital with about 250 beds. They have a good panel of doctors and medical facilities are good in this hospital in comparison to the rest in the neighbourhood. The departments include general medicine, paediatric, gynaecology, general surgery, neurosurgery, urology, cardiology, ophthalmology, orthopedics, gastroenterology, anesthesiology and dental. They also render specialty services such as Diabetic clinic, Hypertension clinic, 24 hour emergency services, special clinic for old age and infertility clinics etc., They are able to create their brand value especially in maternity and gynaecological specialty. The Reproductive Centre is a new addition to the Hospital, which has already established itself as one of the best health service providers in Kerala State. Good infrastructure and also Good health information system (HIS) management is available and the hospital also uses advanced technologies in treating patients.
Pricing is bit high in comparison to the rest of the hospitals in the district. Their consultants are highly qualified and experts in their respective specialties. But all other categories of health care employees are not that qualified, except few departments. They are hiring retired employees as well as diploma candidates for various supervisory posts in the hospital and giving salary less than that of their counterpart hospitals. Though they seems to be quality conscious, their efforts for quality improvement is limited to satisfying only external customers and few categories of health care professionals. Training for employees is on but yet to take place in full swing. TQM initiatives are on and awareness has been created about quality initiatives to a great deal.

**Hospital -2**

It is a charitable and super-specialty ISO certified hospital with a bed-strength of 635. The Hybrid Cath lab facilities and Comprehensive Cancer treatment are one of the best in the state itself. With a major research center and group of teaching institutions, it marks an important position in the healthcare of Central part of Kerala. More than 25 departments function round-the-clock in the hospital. Qualified and experienced medical and paramedical staffs work in this hospital. This hospital provides treatment to 3 lakhs outpatients and 50,000 inpatients per annum. Top management includes Priests and religious sisters. Most of the supervisory posts are held by religious sisters, whose educational qualifications and salaries are not well defined. The hospital has been awarded by the Kerala state pollution control board consecutively for the last five years. The hospital has applied for NABH accreditation and is in process. It has a quality department headed by a quality coordinator and supported by few quality executives. The department coordinates the accreditation process in the hospital. The HR Department coordinates various training programmes for all categories of
personnel. Performance evaluation is conducted periodically. Employees lack knowledge on TQM. Efforts are taken to motivate employees.

**Hospital-3**

It is a 200 bed strength multispecialty charitable hospital which caters to more than 50,000 outpatients and 20,000 inpatients every year. About 20 departments function round-the-clock in the hospital. Qualified, Committed and skilled medical and paramedical professionals work in the hospital. Most of the supervisory positions in the hospitals are occupied by Religious sisters of the community who run the hospital. Their salaries are not well-defined. Good infrastructure is available. Customer management is relatively good. The hospital is trying to introduce new services as per patients’ requirements within their limitations. Employees are given very good training. Salaries of certain categories of employees are comparatively low. The hospital uses advanced technology in patient’s treatment. Health information management is good. TQM implementation has been undertaken. Employees are knowledgeable about the basic concepts of TQM and the quality training is on even though not in its advanced stage.

**Hospital - 4**

This Medical Centre is a 275 bedded multi-specialty hospital, which functions as a charitable institution. They offer general specialty and super-specialty services. They also run Learning Disability Clinic, Well-Baby Clinic, Antenatal Clinic, Bariatric Clinic, Reproductive Endocrine Clinic, Endocrine Clinic, Thyroid Clinic, Insulin Pump/Diabetic in Pregnancy Clinic, Cholesterol Clinic, Hyper Tension Clinic, Diabetic Foot Care Clinic and Diabetics Clinic. They have a good panel of doctors and other paramedical staffs. The supervisory positions of the staffs in most of the departments are held by the members of the community, so salary scales are
not well-defined. Customer management is good in this hospital. The hospital is able to provide patient care at an affordable cost. The infrastructure facility is good. They don’t have a quality department and planning to go for NABH accreditation in the coming years. They do performance evaluation of employees at regular intervals and training is also provided. The hospital uses advanced technology in treatment of the patients. Information management is good. The TQM initiatives are on. The employees are aware of quality related issues.

**Hospital-5**

This is a 250 bedded charitable Hospital. The hospital is equipped with various Facilities including Ultrasonography, Coronary Care Unit, Ophthalmic Assistant, X-Ray etc. Departments include General Medicine, Cardiology, Surgery, Gynecology, Pediatrics, Anesthesiology, Radiology, Orthopedics, Traumatology & Physiotherapy. Good panel of doctors and other paramedical staffs work in this hospital. Most of the supervisory positions are held by religious sisters. New and advanced services are available for patients. Pricing is comparatively low. Good infrastructure and good health information management are the hallmarks of the hospital.

Top management is quality conscious. TQM awareness is good. Employees are given training and their performance is evaluated periodically. They are paid less compared to other hospitals but the employees are service oriented. Employee turnover is more in this hospital. Quality is considered to be of prime importance while procuring medicines and equipment and also providing treatment so the awareness on issues of TQM is quite good.
Hospital-6

It is a 400-bedded multispecialty health care institution in central Kerala. It has 24 departments with CT scan, Doppler scan, Ultrasound scan, EEG, Endoscope and several other modern facilities. The hospital is taking efforts to extend the medical facilities to the poor and the marginalized at an affordable rate. Top management is quality conscious and is taking efforts to improve the quality of health care services offered by the hospital continuously. They have quality department and are planning to go for NABH accreditation in the coming years. Good infrastructure facility, Good customer management and health information system management is available. Employees are given training and their performance is evaluated periodically. Quality is considered prime importance while procuring medicines and equipment. Employees are constantly upgrading with the TQM knowledge.

Public Hospital Sector

These hospitals are owned and funded by the state Government. They provide health care free of cost and in some cases nominal amounts for admission to special rooms and for medical and surgical consumables. They procure medicines from KMSCL (Kerala Medical Services Corporations Ltd.), a company owned by the State government. It acts as the central procurement agency for all essential drugs and equipment for all public healthcare institutions under the department of Health and Family welfare of the state. Poor infrastructure, inadequate staff, lack of resources and inefficient health information management are some of the major problems of these hospitals. Though the government takes serious measures to improve the quality of health care services in the state, it is still in its infancy stage in these hospitals. The government initiatives include NABH accreditation of selected hospitals and a state level accreditation for all the health care institutions in the state.
(KASH-Kerala Accreditation Standards for Hospitals). Also the DHS and DMO organize training programme for all categories of health care professionals. There is a Hospital Development committee to keep constant vigil on the working of the Institution concerned and provide financial assistance whenever necessary. The hospitals have adopted many quality related concepts to enhance the quality of service. The employees are aware of the TQM concepts to some extent.

**Hospital-1**

It is a 374 bedded state owned hospital in Kottayam. Like any other hospital part of the public health system in Kerala this Hospital too is funded solely by the state government, and all the services are highly subsidized. Treatment for citizens classified under the Below Poverty Line category is fully subsidized. The hospital is selected for NABH accreditation in the state. Efforts are made to improve the processes and service quality aimed at improving the quality of treatment. State level trainings, district level and institutional level trainings are conducted for the implementation of the NABH standards in this hospital. Pre-assessment has been conducted by Quality Council of India in this hospital. Hospital procure medicines from KMSCL (Kerala Medical Services Corporations Ltd). The hospital provides all the services, most importantly, surgery, medicine, cardiology, obstetrics and gynecology along with other specialties. It serves more than 60,000 outpatients and 20,000 inpatients every year. Hospital has got adequate man power in all specialties. A good functional Blood Bank, laboratory that received NABL accreditation having all necessary equipment and testing facilities, appropriate drug storage facility, voluntary agencies providing free food to inpatients etc., are the major notable assets of this hospital. But lack of space can be observed in some departments. The employees have attended workshops on Quality related topics and have awareness of quality issues.
Hospital-2

This is one of the Taluk level hospitals controlled by the state government. It provide health care free of cost. They procure medicines from KMSCL. Quality improvement initiatives are on in this hospital. The hospital has plan to improve upon the various aspects of its operations. The Hospital Management Committee of the hospital ensures delivery of various services as per guidelines. Internal audits (IA) are conducted. DHS, DMO and the institution itself organize training programme for all categories of health care professionals. Customer feedback is obtained in the form of complaint box. The hospital is lacking proper physical facilities and also advanced treatment facilities. However, the employees have some exposure to TQM concepts.

Hospital-3

It is a 142 bedded General Hospital in Kottayam district of Kerala. The Specialty care services such as Surgery, Medicine, OBG, Emergency, Anaesthesia, Paediatrics, Dental, Ortho, Dermatology, FP services, Service of Blood bank, Pathology etc are working in the hospital. Almost all laboratory services are available including X-ray, ECG, TB and HIV. Jyothis or Integrated Counselling and Testing Centres (ICTC) Centres in the hospital provide HIV counselling and testing and treatment, referrals free of cost. Employee’s performance is evaluated periodically and the employees are rewarded for their performance. There is a Hospital Development committee to keep constant vigil on the working of the Institution concerned and provide financial assistance whenever necessary. The hospital has been selected for KASH accreditation (KASH-Kerala Accreditation Standards for Hospitals) by the state government and the process is ongoing. Clinical Lab of the hospital is certified by Quality council of India. Employees are given training. The aims is to enhance the patients’ quality of care by providing better medical
treatment and preventive healthcare care services. Human resource is reported to be insufficient in this facility. Poor infrastructure, lack of resources and inefficient health information management are some of the major problems of this hospital. The employees have knowledge of TQM and are aware of quality issues.

**Hospital-4**

This is a 207 bedded referral hospital in the district which is owned and funded by the state Government. It provides health care free of cost and in some cases nominal amounts for admission to special rooms and for medical and surgical consumables. Specialties include General medicine, Gynaecology, Paediatrics, General surgery, Orthopaedics, ENT, Ophthalmology, Psychiatry, Dermatology and Anaesthesia. HIV Counseling centre, Pain and Palliative unit, Jyothis for HIV counselling and family welfare center also function in this hospital. The hospital procures medicines from KMSCL. Customer feedback is obtained in the form of complaint box. The hospital is selected for KASH accreditation by the state government and in-service training is given to the employees at regular intervals. The hospital has been trying to provide better care to its customers. The hospital lacks proper infrastructure facility, inadequate staffing, ineffective health information management are some of the major deficits in this hospital. The employees are aware of quality concepts.

**4.8.2 The Data collection process**

Thus both the private and the public sectors were considered for sample selection in this research. The private hospitals included both for profit and not for profit organizations. For public hospitals permission for data collection was obtained from Directorate of Health Services (DHS) Thiruvananthapuram. For private hospitals, individual hospital top
management personnel were approached and permission was obtained. Quality coordinators, Public relations officer/Lay Secretaries of the sample hospitals were given the list of the top and middle level manager category personnel working in these organizations. Questionnaires were administered personally and were collected back. The respondents included Medical Superintendents, Medical Officers, Administrators, Directors, Public Relations Officers, Lay Secretaries and personnel in-charge of various departments such as Medical, Dental, Nursing, Pharmacy, Clinical laboratory, Radiology, Physiotherapy Speech therapy, Dietary, Maintenance, Pastoral care, Accounts and other allied health departments in the hospital. Among the 304 respondents, 213 were from the Private sector hospitals and the remaining 91 were from the public sector hospitals.

Semi-structured interviews were also conducted with senior employees or quality coordinators of few selected hospitals to elicit further information. The exact number of sample for the semi-structured interview is mainly judgmental and is context specific. In this research a fair sample size was required so initially six managers from the private and public sector hospital were targeted and after a couple of meetings, four managers were considered for the interview for their extensive knowledge in TQM implementation and their willingness to participate in this exercise. Moreover, through informal interaction with these four employees it was found that they were quite knowledgeable on the subject as well as aware of the TQM issues in their hospitals. Thus four semi-structured interviews were conducted.

The ethical permission was taken from the concerned authority of the hospitals for conducting the interview and confidentiality of their identity was ensured. The interviewees were briefed about the total time of the interview and were free to stop the discussion at any point in time or permitted to refuse to reveal any confidential matter. With the permission of the interviewee the
entire conversation was recorded so that the time involved in writing could be saved.

The data thus collected was subjected to analysis which included descriptive statistics & inferential statistics using IBM SPSS 19 and two models were analyzed: measurement model and structural model using SEM package Smart PLS 2.0 and the inferences were drawn. This had led to the development of the model for TQM implementation which leads to the gaining of CMA and enhance the BNP. This entire process is depicted in Figure 4.1

![Diagram of the Data Collection Process]

**Figure 4.1:** The Data Collection Process
4.9 Statistical Analysis

4.9.1 Quantitative analysis

The quantitative analysis carried out in this research included both the descriptive statistics and the inferential statistics. Descriptive statistics was used in this research to consolidate on the results in the form of demographics, Skewness and Kurtosis, overall perceptions, inter-sector comparisons, etc., whereas, the inferential statistics were used for providing the basis for drawing inferences and conclusions mainly through hypotheses testing.

4.9.1.1 Descriptive Statistics

4.9.1.1.1 Skewness and Kurtosis: Skewness is an indicator used in distribution analysis as a sign of asymmetry and deviation from a normal distribution, whereas, Kurtosis is the indicator used in distribution analysis as a sign of flattening or "peakedness" of a distribution. If Skewness is greater than zero it is a Right skewed distribution, with most values are concentrated on left of the mean, with extreme values to the right. If the Skewness is less than zero it is a left skewed distribution and most values are concentrated on the right of the mean, with extreme values to the left. If Skewness is equal to zero the mean equals median and the distribution is symmetrical around the mean and this refers to the ideal situation. In case of the Kurtosis, if the value is above 3, it is called Leptokurtic distribution, sharper than a normal distribution, with values concentrated around the mean and thicker tails. This means high probability for extreme values. If the Kurtosis is less than 3, it is called Platykurtic distribution, flatter than a normal distribution with a wider peak. The probability for extreme values is less than for a normal distribution, and the values are wider spread around the mean. If the Kurtosis equals 3, it is called Mesokurtic distribution and represents normal distribution. This analysis was performed in this research as it is important to confirm the normality of distribution for applying the statistical techniques.
4.9.1.2 Overall Perceptions and Inter sector comparison: To study the overall perception of the respondents about the three constructs, the response on the Likert 5-point scale was rated under five distinct categories. If the response was 1 it was rated as ‘Bad’, 2 was rated ‘Poor’, 3 was rated ‘Average’, 4 was rated as ‘Good’ and 5 was rated as ‘Very good’, based on the total responses received on the questionnaire on these categories for the individual constructs. Based on the total number of responses in each category, the percentage response was calculated in each category so as to obtain the overall perception on each of the constructs. Inter sector comparisons of both the private and the public sector hospitals were also carried out for cross comparison and benchmarking purpose.

4.9.1.2 Inferential Statistics

The inferential statistical techniques used in this research included both the conventional statistical analysis in the form of t-tests, and the second generation statistical techniques such as Structural Equation Modeling (SEM) using partial least square technique and Multiple Regression Analysis (MRA). These methods have been explained below.

4.9.1.2.1 The Goodness of Fit

As the original metric was reduced from 90 to 39 items it was necessary to test the goodness of fit of the model with the reduced number of indicators of measurement before subjecting it to the second generation statistical analysis using SEM. The results for both individual measurement models and full measurement models were tested using LISREL software to check if the goodness of fit was acceptable with non-significant $\chi^2$ (Chi-square) ($\geq 0.05$), and the goodness of fit index (GFI), adjusted goodness fit index (AGFI) and Tucker-Lewis index (TLI) values greater than 0.9 and root mean square error of approximation (RMSEA) value $< 0.10$ (Bentler & Bonett, 1980).
4.9.1.2.2 The t-test

The t-test is the obvious choice to test the significance of relationship between the variables when a group of variables have influence on the dependent variable. It is based on the t-distribution. The t-tests are tests for statistical significance that are used with interval and ratio level data. t-tests can be used in several different types of statistical tests:

- to test whether there are differences between two groups on the same variable, based on the mean (average) value of that variable for each group;
- to test whether a group's mean (average) value is greater or less than some standard;
- to test whether the same group has different mean (average) scores on different variables;

To calculate a value of t, the standard procedure is:

a) state the research hypothesis;

b) state the null hypothesis;

c) stipulate whether the t-test will be a one-tailed test or a two-tailed test for significance

d) select the level of alpha; and

e) calculate t, compare with the tabulated value of t and decide if it lies on the acceptance or rejection region, and accordingly, accept or reject the null hypothesis.

In this research this procedure was adopted and the significance value was obtained through the IBM SPSS Statistics 19® software. There is an argument that t-test has to be used only for small samples and for large samples z-test is recommended. But, this argument is based on central Value Theorem which
has its own limitations and research has found that for large samples the t-test value approaches z-test values and thus t-test itself can be used (Rhiel & Chaffin, 1996).

4.9.1.2.3 Multiple Regression Analysis (MRA)

Multiple Regression Analysis (MRA) was used to associate the research variables in this research. The general regression model is given by,

\[ y_i = \beta_0 + \beta_1 x_{i1} + \ldots + \beta_p x_{ip} + e \]  

Where,

- \( y_i \) = the value of the \( i \)th case of the dependent variable
- \( p \) = the number of predictors (independent variables)
- \( \beta_j \) = the value of the \( j \)th coefficient, \( j=0,\ldots,\)
- \( x_{ij} \) = the value of the \( i \)th case of the \( j \)th predictor
- \( e_i \) = the error in the observed value for the \( i \)th case, or the difference between the predicted value of the dependent variable and its true value.

4.9.1.2.4 Structural Equation Modeling (SEM)

While the first generation statistics deal with the micro-analysis of the data the SEM is used for the macro level of analysis. SEM is also known as ‘causal modeling’ as it involves confirmatory factor analysis and path analysis. The multivariate normality holds good in SEM and the model is evaluated by comparing the variance or co-variance. SEM models are also called simultaneous equation models and are basically multivariate regression models. Linear relationship is generally assumed in SEM but it is possible to incorporate powers of the variables if required in the form of polynomial function. SEM demands at least three indicators for a dimension. One important aspect is SEM is that sample size is not an issue but a minimum of 200 samples is required. Bootstrapping technique permits the extrapolation if
required. In this research confirmatory factor analysis was of prime importance as some of the dimensions already had a proved reliability as they have been used by other researchers in different contexts.

SEM is a general form of second generation statistical method that has been used to describe a large number of statistical models combined to evaluate the validity of substantive theories with empirical data. Statistically, it includes General Linear Modeling (GLM) procedures, such as the ANOVA and multiple regression analysis. The SEM has an edge over GLM procedures as it can be used to study the relationships among latent constructs that are indicated by multiple measures. It is also applicable to both experimental and non-experimental hypothesis testing, as well as cross-sectional and longitudinal research situations (Kline, 2005). The SEM takes a confirmatory (hypothesis testing) approach to the multivariate analysis of a structural theory, while dealing with the causation between the variables. The causal pattern of inter-variable relations will have to be established based on the existing theories. The objective of SEM analysis is to test if the hypothetical research model which is established by the researcher is statistically supported. The consistency is tested through model-data fit, which indicates the extent to which the hypothesized network of relations among variables is pragmatic. SEM is a large sample technique and the minimum sample size required is more than 200 (Kline, 2005). The general philosophy of SEM is to undertake path analysis which is also called as causal modeling and covariance structure analysis, which means that from the start to the end of the model, each of the relationship between the latent variables is statistically tested for the significance of relationships.

**Path Model**

Path analysis is an extension of multiple regression where multiple regressions are estimated simultaneously. This can address the mediation,
moderation, and other complex relationship among the latent variables. Structural relations are hypotheses about directional influences or causal relations of multiple variables showing the influence of independent variables on the dependent variables. Thus, path model is sometimes referred to as causal model. The SEM basically tests the interrelations that are hypothesized to generate specific observed covariance (or correlation) patterns among the variables. A typical SEM model has an independent variable or source variable (called an exogenous variable) and a dependent variables or resultant variable (called an endogenous variable) which are linked in the hypotheses. However, some variables can be both endogenous and exogenous and this kind of variable is called a mediator variable. For instance, suppose that employee motivation has a direct impact on performance of employee which, in turn, is hypothesized to affect job satisfaction. In this case performance is a mediator between employee motivation and productivity because it is the exogenous variable for productivity and the endogenous variable for employee motivation.

**Model Statistical Specification.**

The relations in the diagram developed through the hypothetical model are translated into equations and the model is then estimated. Bentler–Weeks gave one method of model specification (Bentler & Weeks, 1980). In this method every variable in the model, latent or measured, is either an independent or a dependent variable. The parameters to be estimated are the (a) regression coefficients, and (b) the variances and the covariances of the independent variables in the model. Initially, it may seem odd that a residual variable is considered an exogenous variable but the residual is on the right hand side of the equation and therefore is considered an exogenous variable:

\[ Y = X\beta + e \]

-----------------------------[1]
Where,

\[ X = \text{Independent variable} \]
\[ Y = \text{Dependent variable;} \]
\[ e = \text{error} \]

**Measurement Model**

The origin of measurement model is from psychometric theories (Kline, 2005). The latent variables cannot be measured directly e.g. employee motivation but are indicated through observable variables called the indicators of measurement. These indicators are the individual items in the questionnaire to which the respondents indicate their preferences on the ordinal scale. Latent constructs such as employee motivation or satisfaction are often measured by responses to a number of items that are designed to tap those constructs. Responses to a study by the sample are the scores they mark on the Likert scale. Factor reduction is an important aspect in the validation of the questionnaire and statistical techniques, such as exploratory or confirmatory factor analysis are used. These techniques are used to examine if the number of indicators in the latent constructs are adequate to measure that variable. The measurement model in SEM is evaluated through confirmatory factor analysis (CFA). CFA differs from Exploratory Factor Analysis (EFA) in that factor structures are hypothesized a priori and verified empirically rather than derived from the data. EFA often allows all indicators to load on all factors and does not permit correlated residuals. EFA suggests a relationship between the item which is in the form of an indicator and factors. A strong association between an item and a factor, a large factor load, suggests that the item co varies with the factor. If the items that load on a particular factor appear to be substantively similar and could reasonably be considered to represent a particular domain, the researcher may use this index to represent a particular
latent construct. Solutions for different number of factors are often examined in EFA and the most sensible solution is interpreted. In contrast, the number of factors in CFA is assumed to be known. In SEM, these factors correspond to the latent constructs represented in the model. CFA allows an indicator to load on multiple factors (if it is believed to measure multiple latent constructs). It also allows residuals or errors to correlate (if these indicators are believed to have common causes other than the latent factors included in the model). Once the measurement model has been specified, structural relations of the latent factors are then modelled essentially the same way as they are in path models. The combination of CFA models with structural path models on the latent constructs represents the general SEM framework in analyzing covariance structures.

The measurement model is concerned with the reliability and validity of the model. The maximum likelihood method of estimation is the most widely chosen method for conducting the SEM analysis. There are several goodness-of-fit (GOF) indices for both the initial measurement model and final measurement model for the constructs used in the analysis. If the overall GOF measures for some of the initial models do not meet the acceptable criteria, the models may be revised based on assessment of factor loading and the indicators of modification indices. Thus the original questionnaire can be reduced in terms of the number of items and once again subjected to GOF test criterion. GOF results for both individual measurement models and full measurement models should remain within the acceptable range with non-significant $\chi^2$ (Chi-square) ($\geq 0.05$), goodness fit index (GFI), adjusted goodness fit index (AGFI) and Tucker-Lewis index (TLI) values greater than 0.9 and root mean square error of approximation (RMSEA) value $< 0.10$. In this research LISREL software package was used to undertake these calculations.
To verify the reliability of the latent variables in the model, internal consistency reliability measure, item reliability measure and composite reliability measures are calculated. The Cronbach’s alpha coefficient and the composite reliability should be above 0.6 for the acceptable level of reliability, however higher values indicate better reliability of the data. To test for discriminant validity, the square root of average variance extracted (AVE) for each construct is compared with the correlation between the construct and the other constructs. For acceptable discriminant validity between each pair of construct, all the AVE square roots should be greater than the correlation between the constructs. The result of item reliability (IR) measured as standardized factor loading (FL) should be usually greater than 0.5 if the item has to be included in the questionnaire.

**Structural Model**

Structural model of the analysis gives the inter-relationships between the exogenous and the endogenous variables of study. This is used for the hypothesis testing at the macro level of the latent variables. Structural model was used in this research for the hypotheses testing in which the influence of TQM dimensions on both Competitive Advantage (CMA) and Business Performance (BNP) was tested. The factor loadings after reduction, path coefficients, $R^2$ value which is an indication of goodness-of-fit and the t-values are estimated in the structural model. The path coefficients indicate the strength of the relationships between the latent variables. The values of path coefficients can vary from zero to one. Higher the path coefficient value better will be the relationship. The percentage influence of the exogenous variables on the endogenous variables as expressed by $R^2$, again the higher the $R^2$ the better will be the goodness-of-fit of the model (cut off 0.1). The structural model also gives the t-values of the relationships which gives the statistical significance of the relationship between the latent variables.
4.9.2 Qualitative Analysis

Qualitative research in this study was restricted to the content analysis during the literature review and the interpretation of the semi-structured interviews and also the response to the qualitative questions asked in the questionnaire. The content analysis in the literature review had the main purpose of analyzing the literature for the screening of the available models in order to narrow down at the dimensions which best describe the research construct particularly in the context of hospital as a service industry. The tool used for narrowing down to the most relevant dimensions of TQM practices was Analytical Hierarchy Processing (AHP). While software is available for using the AHP, as the number of variables were relatively low, manually the scores were calculated and the hierarchy was established between the dimensions.

The second part of the qualitative analysis included the interpretation of the semi-structured interviews and also the response to the qualitative questions asked in the questionnaire. The standard procedure of analysis was used here. According to which the contents of the semi-structured interviews were analyzed. First part was to check whether they supported the empirical findings about the perceptions of the TQM practices in the hospital. Second part was to find if the hypotheses which were supported were justifiable as per the views of the semi-structured interviews. And final part was to identify the challenges they had faced in TQM implementation and building a model which would support the TQM implementation in the hospitals.

4.10 Limitations of the Methods

The statistical methods were the basis for the quantitative analysis used in this research. However, it has to be noted that these methods have certain limitations which are inevitable. This includes several specific issues, to name a few, the tests are only useful aids for decision-making. Hence, proper
interpretation of statistical evidence is important to intelligent decisions. So the interpretations made in this research need not necessarily be the best possible ones. The statistical tests do not explain the reasons as to why does the statistical difference exist, say between the means of the two samples, which also act as the limitation of the methods. Results of significance tests are based on probabilities and as such cannot be expressed with full certainty. Statistical inferences based on the significance tests cannot be said to be entirely correct evidences concerning the truth of the hypotheses, and the size of the sample plays a dominant role here (Field, 2009). As the second generation statistical tool is used in this research the sample size of just 200 may be adequate and in this research a sample size of 304 respondents has been chosen so to a considerable extent the analysis is reliable but still it is not completely generalizable.

Multiple regressions used in this research has its own limitation. First of all the relationship may be nonlinear but the multiple regression assumes a linear model. However, the coefficient of determination is in the acceptable range so the limitation may be overlooked as far as the generalizations are concerned. The SEM used in this research has its own set of limitations. In SEM analysis with regard to the process of model specification and identification there are several compromises made that may vitiate the original theory or model. For example the moderating and intervening variables are always questionable. So, this may affect the accuracy of generalizations based on SEM. The mathematical foundation lies on Partial Least Square Method (PLSM) which again is an approximation method which limits the accuracy of the model. Assumption of linearity is also a limitation of SEM. Requirement of a minimum of 10 subjects per estimated parameter is also a limitation of SEM. Residual covariance should be small and oriented towards zero for applying SEM. Finally, none of the reliability measures are 100% accurate in
predicting the actual values and the repeatability of the results and the consistency are always questionable (Hussain, 2015). Despite these limitations in the context of this research SEM has yielded results which have led to the development of a model to explain the interrelationships between the variables of interest.

4.11 Summary

This chapter has described the research methodology adopted in this research and the reason why a particular method was chosen in the place of the other. The nature of the research and the research variables involved and their dimensions are listed. The research design adopted and the methods used in this research are explained. Identification of the sample and rationale for its selection has been explained. The metric development is also explained. The reliability, validity, and practicality issues have been discussed. The data collection process has been given schematically and each of the step involved has been explained. The organization profile of the hospitals where the questionnaire survey was conducted is presented in this chapter. The two distinct types of statistical analysis have been explained. The t-test and multiple regression analysis have been explained in detail. The chapter gives a detailed explanation to structural equation modeling. The procedure adopted in qualitative research is also narrated and the limitations of the methods used in this research have been recorded in this chapter. Finally, the chapter ends with the summary.