CHAPTER 3

RESEARCH METHODOLOGY

The methodology of research indicates the general pattern of organizing the procedures for gathering valid and reliable data for the purpose of investigation. The methodology of this study includes the description of research design, sample size, sampling technique, development and description of tool, data collection procedure and method of analysis. The validity of the research depends on the systematic method of collecting the data and analyzing them in a sequential order. In the present study, extensive use of both primary and secondary data was collected systematically. Field survey method was employed to collect the primary data from 840 respondents in all the 32 districts of Tamilnadu. For this purpose a well-structured questionnaire was used for collecting data.

3.1 OBJECTIVE OF THE STUDY

The objectives of the study are given in the following:

1. To study the conceptual framework of Emotional Intelligence.

2. To identify the aspects induced to regulate Doctor’s emotions for the relationship with others both in personal and professional context.

3. To explore the capability of Doctors to regulate the feelings and emotions of others through emotional Intelligence.
4. To analyze the awareness and understanding of PPLSS scheme among the selected sample Doctors (respondents).

5. To develop a unique model for emotional Intelligence to regulate patients and public through PPLSS Scheme exclusively for Doctors.

### 3.2 SAMPLING METHODS

First-hand information for the present research has been collected from 840 sample respondents. The respondents were selected by using stratified random sampling technique. The stratification covers the Doctors who are the members of PPLSS Scheme in IMA – TNSB, in all the 32 districts of Tamilnadu, in proportion to their population in each of the district. From the population 8,395, ten percentage of the population has been selected randomly and proportionately to every district. The details of sample selection are represented in the following Table 3.1.

**Table 3.1 District wise details of the respondents in the study area**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the District</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ariyalur</td>
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<tr>
<td>2</td>
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<td>3</td>
<td>Coimbatore</td>
<td>57</td>
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<td>Cuddalore</td>
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<td>Dharmapuri</td>
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<td>Dindigul</td>
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<td>7</td>
<td>Erode</td>
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</tr>
<tr>
<td>8</td>
<td>Kanchipuram</td>
<td>16</td>
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<td>9</td>
<td>Kanniyakumari</td>
<td>32</td>
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<tr>
<td>10</td>
<td>Karur</td>
<td>20</td>
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<tr>
<td>S. No.</td>
<td>Name of the District</td>
<td>No. of Respondents</td>
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<tr>
<td>11</td>
<td>Krishnagiri</td>
<td>14</td>
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<tr>
<td>12</td>
<td>Madurai</td>
<td>47</td>
</tr>
<tr>
<td>13</td>
<td>Nagapattinam</td>
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<td>14</td>
<td>Namakkal</td>
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<tr>
<td>15</td>
<td>Perambalur</td>
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<td>Pudukkottai</td>
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<td>The Nilgiris</td>
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<td>Villupuram</td>
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<td>32</td>
<td>Virudhunagar</td>
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</tbody>
</table>
3.3 SOURCES OF DATA COLLECTION

The study uses both primary and secondary data.

3.3.1 Primary Data

The major source of the data used to carry out the analysis is primary data. In order to fulfill the objectives set out; a sample study was undertaken by the use of well-framed questionnaire and got them duly filled in. Field survey method was employed to collect the primary data from 840 respondents through a well framed questionnaire. The respondents with varying backgrounds in all the 32 districts of Tamilnadu, based on aspect of demography, like sex, age, education qualifications, specialization, place of education, nativity, number of years of experience, place of work, marital status and type of their family constituting a Doctor.

A unique feature was that all the 840 respondents filled in the questionnaires with much zeal. This is due to the high level of interests for this focus of study among the respondents and the researcher’s good rapport established with them.

3.3.2 Secondary Data

Though the core of the present work is dependent on the primary data, the study, like any other research work, users some secondary data for better understanding of the Emotional Intelligence of individuals who are exposed to human relationships to extreme levels in day today life, particularly on Doctors. The secondary data namely literature relating to the study were gathered from national and international journals, articles, dissertations and books. The latest information was gathered from IMA – TNSB office, other related district offices, and reliable internet sources also.
They were utilized to get necessary and latest information required for this study. A number of standard books, particularly written by Daniel Goleman, were referred in the domain of Emotional Intelligence.

3.4 DISCUSSIONS AND INFORMAL INTERVIEWS

In order to know the emotional intelligence practiced by the Doctors of Tamilnadu, with special reference to PPLSS Schemes of IMA – TNSB, several rounds of discussion were held with Doctors occupying different positions in PPLSS Scheme of IMA – TNSB and also with knowledgeable persons in this field. For this purpose, a good rapport had been established with the various persons in different departments related with this field and PPLSSS associates of IMA-TNSB.

3.5 TOOLS OF DATA COLLECTION

By virtue of a mass of data obtained from the research survey, as well as data from secondary sources collected are presented in the present report, descriptive and analytical research were considered to be the most appropriate for the study. The research problem and questionnaire were all framed accordingly. The suggestions offered in the final chapter of the present research report emerged from the inferences drawn from the sample respondent’s information about the emotional intelligence in respective of their personal and professional life. The questionnaire for the research consists of 11 variables covering 72 statements with five point rating scale and 35 rank statements.

3.6 CONSTRUCTION OF THE QUESTIONNAIRE

The key aspects of the present research were identified from the preliminary interview (Pilot Study) with a few selected respondents. The
questionnaire so drafted was circulated among some research experts and research scholars for a critical view with regard to the format, sequence, wording and the like. The questionnaire was drafted in the light of their comments.

3.7 PILOT STUDY

The questionnaire meant for the respondents were pre-tested with eighty four respondents. After pre-testing, necessary modification were made in the questionnaire to fit in the track of the present study.

3.8 FRAME WORK OF ANALYSIS

The core of the study being ‘A study of emotional intelligence practiced by Doctors of PPLSSS in IMA – TNSB’ in all districts of Tamilnadu, the study centers around the dependant variables, viz, the level of application of emotional intelligence to regulate personal and professional life of Doctors.

3.9 APPROACH TO ASSESS THE EXTENT OF UTILIZATION

The differences in the context of emotional intelligence by different types of respondents based on their like sex, age, education qualifications, marital status, the place of education, specialization, number of years of experience, place of work and the levels of emotional intelligence practiced by the Doctors of PPLSS scheme in 146 centers of IMA –TNSB, was studied by means of percentage analysis, averages, ranges and standard deviation, chi-square test as and when they were found necessary. Further multivariate analysis viz., multiple regression analysis, and factor analysis were employed in this survey. In addition to these tools, Henry Garrett ranking technique was
employed to ascertain the order of the issues. The different tools of analysis and the variables are as follows:-

3.10 TOOLS OF DATA ANALYSIS

3.10.1 Factor Analysis

Factor analysis is a method used to transform a set of variables into a small number of linear composites, which have maximum correlation with original variables. Factor analysis is used to study a complex product or service in order to identify the major characteristics or factors considered important by the respondents. The purpose of factor analysis is to determine the responses to the several numbers of statements, which are significantly correlated. If the responses to the several statements are significantly correlated, it is believed that the statements measure some factors common to all of them.

The study will bring to light the factors affecting the balance of professional and personal fronts with respect to the level of emotional intelligence towards the relationship competencies.

3.10.2 Henry Garrett Ranking Technique

This technique was used to rank the benefits and the problems faced by the respondents in balancing professional and personal life with respect to relationship and the management of the self in the context of emotional intelligence. The order of merit given by the respondents was converted into ranks by using the following formula.

\[
\text{Percentage position} = 100\left(\frac{R_{ij} - 0.5}{N}ight)j
\]
The percentage position of each rank thus obtained was converted into scores by referring to the table given by Henry Garrett. Then for each factor the scores by referring to the table given by Henry Garrett. Then for each factor the scores of individual respondents were added together and were divided by the total number of respondents for whom the scores were added. These mean scores for all the factors were arranged in the order of ranks and consequently inferences were drawn on the basis of scores of these factors.

3.10.3 Independent Sample t-test

The independent t-test compares the means between two unrelated groups on the same continuous, dependent variable. The SPSS t-test procedure allows the testing of equality of variances (Levene's test) and the t-value for both equal- and unequal-variance. It also provides the relevant descriptive statistics

Assumptions

- Independent variable consists of two independent groups.
- Dependent variable is either interval or ratio
- Dependent variable is approximately normally distributed.
- Similar variances between the two groups (homogeneity of variances).

The formula for calculating t for equal sized, independent samples is shown below (Equation (3.1)). Hover over any part of it for an explanation of what that part means.

\[ t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \]  

(3.1)
where \( x_1 \) is read as \( x_1\text{-bar} \) and is the mean of the first sample;

\( x_2 \) is read as \( x_2\text{-bar} \) and is the mean of the second sample;

The variance is the standard deviation squared (hence \( s^2 \)).

### 3.10.4 One Way Anova Analysis

Analysis of variance (ANOVA) is one statistical technique used to determine how one variable relates to another. In its simplest form, ANOVA provides a statistical test of whether or not the means of several groups are all equal.

- It is an extension of t-test, in t-test we use two groups to compare.
- In ANOVA, the factor group is more than two groups.
- The ANOVA F statistic is calculated by the formula

\[
F = \frac{\text{Variance Between Groups}}{\text{Variance Within Groups}}
\]

### 3.10.5 Chi-Square Test

The degrees of influence of the following independent variables pertaining to respondents’ level of applying emotional intelligence:

\[
\begin{align*}
    x_1 &= \text{Respondents Age} \\
    x_2 &= \text{Respondents Sex} \\
    x_3 &= \text{Respondents Qualification} \\
    x_4 &= \text{Respondents Specialization} \\
    x_5 &= \text{Respondents Native}
\end{align*}
\]
In order to identify the factors influencing the respondents and their level of applying emotional intelligence by the selected respondents, a chi-square ($\chi^2$) test was used, and the formula of Chi-Square test is furnished below:

The null hypothesis states that there is no significant difference between the expected and observed frequencies. The alternative hypothesis states they are different. The level of significance (the point at which you can say with 95% confidence that the difference is NOT due to chance alone) is set at .05 (the standard for most science experiments.) The chi-square formula used on these data is (Equation (3.2))

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

where $O$ is the Observed Frequency in each category

$E$ is the Expected Frequency in the corresponding category is sum of df is the "degree of freedom" (n-1)

$\chi^2$ is Chi Square

3.10.6 Correlation Analysis

If relationship between two random variables or two sets of data, Correlation is a statistical measure that indicates the extent to which two or
more variables fluctuate together. A positive correlation indicates the extent to which those variables increase or decrease in parallel; a negative correlation indicates the extent to which one variable increases as the other decreases.

The population correlation coefficient $\rho_{X,Y}$ between two random variables $X$ and $Y$ with expected values $\mu_X$ and $\mu_Y$ and standard deviations $\sigma_X$ and $\sigma_Y$ (Equation (3.3)) is defined as:

$$\text{Corr}(X,Y) = \frac{\text{cov}(X,Y)}{\sigma_X \sigma_Y} = \frac{E[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y}$$

where, $E$ is the expected value operator, $\text{cov}$ means covariance and, $\text{corr}$ a widely used alternative notation for the correlation coefficient.

3.10.7 One Sample t test

The t-statistic was introduced in 1908 by William Sealy Gosset, a chemist working for the Guinness brewery in Dublin, Ireland. Gosset had been hired due to Claude Guinness's policy of recruiting the best graduates from Oxford and Cambridge to apply biochemistry and statistics to Guinness's industrial processes. Gosset devised the t-test as a cheap way to monitor the quality of stout. The t-test work was submitted to and accepted in the journal Biometrika, the journal that Karl Pearson had co-founded and was the Editor-in-Chief; the article was published in 1908. Since Guinness had a company policy that chemists were not allowed to publish their findings, the company allowed Gosset to publish his mathematical work but only if he used a pseudonym, that was student. Actually, Guinness had a policy of allowing technical staff leave for study (so-called study leave), which Gosset used during the first two terms of the 1906-1907 academic year in Professor Karl Pearson's Biometric Laboratory at University College London. Gosset's
identity was then known to fellow statisticians and the Editor-in-Chief Karl Pearson. It is not clear how much of the work Gosset performed while he was at Guinness and how much was done when he was on study leave at University College London.

**Assumptions**

Most t-test statistics have the form $t = Z/s$, where $Z$ and $s$ are functions of the data. Typically, $Z$ (Equation (3.4)) is designed to be sensitive to the alternative hypothesis (i.e., its magnitude tends to be larger when the alternative hypothesis is true), whereas $s$ is a scaling parameter that allows the distribution of $t$ to be determined.

As an example, in the one-sample t-test

$$Z = \frac{\bar{X}}{\left(\hat{\sigma} / \sqrt{n}\right)} \quad (3.4)$$

where $\bar{X}$ is the sample mean of the data, $n$ is the sample size, and $\hat{\sigma}$ is the population standard deviation of the data; $s$ in the one-sample t-test is $\left(\hat{\sigma} / \sqrt{n}\right)$

$\hat{\sigma}$ is the sample standard deviation.

The assumptions underlying a t-test are that

- $Z$ follows a standard normal distribution under the null hypothesis
- $s^2$ follows a $\chi^2$ distribution with $p$ degrees of freedom under the null hypothesis, where $p$ is a positive constant
- $Z$ and $s$ are independent.
In a specific type of t-test, these conditions are consequences of the population being studied, and of the way in which the data are sampled. For example, in the t-test comparing the means of two independent samples, the following assumptions should be met:

- Each of the two populations being compared should follow a normal distribution. This can be tested using a normality test, such as the Shapiro-Wilk or Kolmogorov-Smirnov test, or it can be assessed graphically using a normal quantile plot.

- If using Student's original definition of the t-test, the two populations being compared should have the same variance (testable using F test, Levene's test, Bartlett's test, or the Brown-Forsythe test; or assessable graphically using a Q-Q plot). If the sample sizes in the two groups being compared are equal, Student's original t-test is highly robust to the presence of unequal variances. Welch's t-test is insensitive to equality of the variances regardless of whether the sample sizes are similar.

- The data used to carry out the test should be sampled independently from the two populations being compared. This is in general not testable from the data, but if the data are known to be dependently sampled (i.e. if they were sampled in clusters), then the classical t-tests discussed here may give misleading results.

3.10.8 Multiple Regression Analysis

Regression is a statistical tool used to find out the relationship between two or more variables. When there are two or more independent variables, the analysis that describes such relationship among the variables is
called the multiple regressions. This analysis is also adopted when one dependent variable is performing the function of two or more independent variables. In multiple regressions, a linear composite of explanatory variables is formed in such a way that it has maximum correlation with an active criterion variable. The main objective for using this technique is to predict the variability of the dependent variable based on its co-variants with all the other independent variables. It is useful in predicting the level of the dependent phenomenon, if the levels of independent variables were given, the linear multiple regression problem is to estimate the coefficients.

\[ B_1, B_2 \ldots \ldots \ldots \text{and} \; B_0 \text{such that the expressions,} \]

Linear regression uses one independent variable to explain and/or predict the outcome of Y. The general form of regression is:

\[ \text{Linear Regression: } Y = a + bX + u \]

where

- \( Y \) = the variable that we are trying to predict
- \( X \) = the variable that we are using to predict \( Y \)
- \( a \) = the intercept
- \( b \) = the slope
- \( u \) = the regression residual.

In order to further reveal support for overarching hypothesis, whether emotional intelligence is positively related to IMA-TNSB and PPLSSS regression analysis were used. In comparison to correlation, regression analysis is more powerful and robust analysis as this will provide the strength of the association while former does only linear relationship. The regression procedure was employed because it provided the most accurate
interpretation of the independent variable. The independent variables were expressed in terms of the unstandardized factor scores (beta coefficients) and r square were included. The significant factors that remained in the regression equation were shown in order of importance based on the beta coefficients. The dependent variable, overall level of outcome was measured on a 5-point Likert-type scale.

Thus, this chapter comprehensively described the research design, sample size, sampling technique, development and description of tool, data collection procedure by the field survey deployed by the well-structured questionnaire and the method of analysis are explained in detail, which consequently undertaken for this study incorporated to evaluate the emotional intelligence practiced by Doctors with special reference to PPLSSS of IMA-TNSB.