CHAPTER II
RESEARCH METHODOLOGY

2.1 Introduction

Research methodology is a way to systematically solve the research problem. Research methodology helps to know the logic behind the methods that the researcher use in the context of the research study and explain why the researcher is using a particular technique. The purpose of the present study is to explore the stress factors among the employees in the five sugar mills in Tamil Nadu. A pretested questionnaire was administered to collect the opinion of the respondents. In this chapter, primary data, secondary data, sampling design, pilot study, pretesting, reliability test, data collection procedure, period of data collection, hypotheses, data processing, tools used for the study and research limitations are discussed.

2.2 Research Design

This is an empirical study based on survey method. In the present study, ex post facto research design was used. Most ex post facto research projects are used for descriptive studies as it describes the state of affairs at present. In this study, the researcher used ex post facto research design for identifying causes and impact of stress among employees in the sugar mills at present condition. The prediction of study factor is not attempted by using the present research design.

2.3 Primary Data

The data regarding the employees were collected with the help of questionnaire designed for this purpose. Two questionnaires, one in Tamil and other in English, were prepared to collect the required data. The English questionnaire was used to collect data from Cane Officers and Tamil questionnaire was used to collect data from Cane Inspectors.

2.4 Secondary Data

The secondary data were collected from sources such as official records, research papers, conference reports, books, journals, newspapers, magazines and websites.
2.5 Sampling Design

In Tamil Nadu, 43 sugar mills are functioning in 19 districts of which 16 in cooperative sector, 2 in public sector and 25 in private sector. The present study is confined to Cane Inspectors and Cane Officers from the five sugar mills in three districts namely Sakthi Sugars Limited and Bannari Amman Sugars Limited in Erode district, Ponni Sugars (Erode) Limited and The Salem Co-operative Sugar Mills Limited in Namakkal district and E.I.D Parry (India) Limited in Karur district of Tamil Nadu. The five sugar mills in these three districts were chosen for the study as their sugar production as well as man power is more when compared to sugar mills in other districts. For selection of the five sugar mills purposive sampling was adopted. All the 330 employees working in these five sugar mills were included for this study. Census method was adopted. Out of 330 samples, 268 employees are Cane Inspectors and 62 are Cane Officers.

2.6 Pilot Study

A pilot study was undertaken by the researcher with twenty employees in the sugar mills to understand the variables involved in the study. A preliminary questionnaire was constructed to collect data from the employees in the sugar mills.

2.7 Pretesting

On the basis of the pilot study, the preliminary tool was structured and pretested. The questionnaire was discussed with three experts namely Dr. Padmini Swaminathan of Madras Institute of Development Studies, Dr. Muthuvelayutham of Anna University and Dr. Padmashini of Bharathiar University for obtaining their opinion. In the light of the comments and suggestions made by them, the questionnaire was revised. The revised questionnaire was circulated among four fellow research scholars for a critical review regarding the word arrangement, format and sequence. Based on the opinion and suggestions given by the employees, a few questions were removed and a few questions were added and the questionnaire was finalized.
The questionnaire was divided into five sections. The first section of the questionnaire consisted of eleven questions relating to personal profile of the employees. The second section comprised of five questions relating to stress symptoms and stress factors. The third section covered four questions relating to impact of stress on health, behavior and job. The fourth section consisted of questions relating to coping strategies. The last section of the questionnaire comprised of four questions relating to social support and expectations of the employees. Stress symptoms, impact of stress on health and coping strategies were measured on a five-point Likert scale: (1) Never, (2) Rarely, (3) Sometimes, (4) Most of the times and (5) Always. Social support was measured on a five-point Likert scale: (1) Strongly Agree, (2) Agree, (3) Neutral, (4) Disagree and (5) Strongly Disagree.

2.8 Reliability Test

For reliability checks, Cronbach’s coefficient alpha was computed for each scale as a measure of internal consistency reliability. The coefficient alpha for the items in questionnaire is 0.77. The resulting reliability estimate is quite high because reliability values between 0.6 and 0.8 are generally considered sufficient for research purposes. The scales used in the present study were considered reliable.

2.9 Data Collection Procedure and Period of Data Collection

The researcher had clearly explained the purposes of the study to the divisional heads of each sugar mill and asked them for the total number of employees in each division. The researcher made use of the questionnaire for collecting primary data from the respondents. Since the employees selected for the study were located in different areas, researcher had collected data through mail by forwarding to their corresponding division offices. Instead of using the name of each sugar mill, the researcher indicated them by numbers such as 1, 2, 3, 4 and 5. The numbers for each corresponding sugar mill name were only known by the researcher. Primary data through the questionnaire were obtained for one year period from December 2011 to December 2012. The researcher got back the mailed questionnaires in direct and through the division offices.
2.10 Data Processing

After completing the data collection, the filled up questionnaires were edited properly to make them ready for coding. Classification tables were prepared with the help of the data recorded into the computer. Statistical package (SPSS) was used to analyze and interpret the data collected.

2.11 Hypotheses

The following hypotheses were framed in the study:

- There is no significant relationship between socio-economic variables and stress symptoms.
- There is no significant relationship between difficult factors in job and stress symptoms.
- There is no significant relationship between socio-economic variables and level of stress being overcome among the respondents.
- The social support factors do not differ significantly with respect to socio-economic variables of the respondents.

2.12 Tools Used for the Study

To attain the objectives of the study, various statistical tools were adopted. They are descriptive analysis / percentage analysis, Chi – Square Analysis, Average Score Analysis, Analysis of Variance, t-Test, Garrett Ranking Technique, Factor Analysis, Simple Regression and Multiple Regression Analysis.

2.12.1 Descriptive Analysis

The descriptive analysis was used in the study for all the questions given in the questionnaire to find the distribution of the respondents falling under each category. It is also expressed in the percentage to facilitate comparison.

2.12.2 Chi - Square Analysis

The Chi - square analysis was carried out to test the significance of one factor over the other. The factors in the study are classified under two groups,
namely a group consisting of demographic factors and another group consisting of stress factors, each of the personal factors of the respondents are compared with each of the study factors and chi-square test is applied for the significance. The tests are carried out at 1 % and 5 % level of significance.

2.12.3 Average Score Analysis

The five-point scaling technique was employed in the study to convert the qualitative information into a quantitative one. Based on the information supplied by the respondents the average score was calculated to determine the level of agreeability of the different category of the respondents on the various aspects regarding the stress symptoms, physical and mental health problems, coping strategies and social support factors. The score 5 is given for always / strongly agree, score 4 for most of the times / agree, score 3 for sometimes / neutral, 2 for rarely / disagree and score 1 for never / strongly disagree.

2.12.4 Analysis of Variance

The one-way analysis of variance (ANOVA) test was used to compare mean scores of more than two groups. The procedure assumed that the variances of the groups were equal and it was tested with Levene’s test statistics. The significant difference between the mean scores was tested with respect to the various factors.

2.12.5 t-Test

T-test was used in the study to compare mean scores of two groups. The procedure assumed that the variances of the two groups are equal and it was tested with Levene’s test statistics. The significant difference between the mean scores was tested with respect to the various factors.

2.12.6 Simple and Multiple Regression Analyses

The regression shows functional relationship between the variables. If there are only two variables in the study of regression then it is called as simple regression, otherwise the study is multiple regression. In this study both simple and multiple regression analyses were employed. Simple regression analysis was used
to find the effect of stress symptoms score on physical and mental health problems score through r. Multiple regression analysis was used to determine the percentage of explanation made by each independent variable (stress symptoms score and physical and mental health problems score) over the dependent variable (job performance score) through $R^2$, the coefficient of determination. This technique was employed to find the independent variable with maximum contribution over the dependent variables selected for the study.

2.12.7 Garrett Ranking Method

The Garrett Ranking method was employed in the study to analyze the factors influencing stress for the respondents in the study. Based on the opinion of the respondents, the rank was calculated for the different categories of the respondents. The ranks given were converted into scores with the following formula:

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\text{Percentage Position} = \frac{100 \left( R_{ij} - 0.5 \right)}{N_j}
\]

Where,

- $R_{ij}$ - Rank given for the ith factor by the jth respondent
- $N_j$ - Number of factors ranked

The percentage position of each rank obtained was converted into scores by referring to the table given by Henry Garrett. Then for each factor the scores of individual respondents were added and 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 their ranks and the inferences were drawn.

2.12.8 Factor Analysis

The factor analysis is used for two purposes i) data reduction and ii) identifying the important factors. In the study, the factor analysis was carried out to identify the important factors for social support. This was ascertained based on the extraction values of the principal component analysis.
2.13 Research Limitations

The methodology of this study presents several limitations.

1. The first limitation addresses that field staff members like Cane Officers and Cane Inspectors in Cane department of five sugar mills were studied. Hence the results may not apply to office staff members, other departments and other sugar mills in Tamil Nadu.

2. The second limitation is related to delay in obtaining filled questionnaire. Since the employees selected for the study were field staff members and working in different locations with tight deadlines, the researcher had to wait for the questionnaire to be filled. The researcher noted that some employees left some questions unfilled due to fear of management. Hence, the researcher contacted those employees in person and through phone call, and promised them that the confidentiality of the information was guaranteed and once again explained the purpose of the study to get answers for the unfilled questions. Thus the delay in obtaining filled questionnaire resulted in waste of time in making earlier analysis.

3. Finally, the limitation of the statistical tool applied in the study also influences the results of the study.