



DISSERTATION REPORT



THE PSYCHOLOGICAL STUDY OF HUMAN FACTORS IN AVIATION

By

FEBSIN ANAND J

SAP ID: 500066234

Guided By

Ms. K. KALAIVANI

Assistant Manager, Learning and Development

Air India SATS Airport Services Private Limited,

Thiruvananthapuram

**A DISSERTATION REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR**

MBA AVIATION MANAGEMENT

OF

CENTRE FOR CONTINUING EDUCATION

UNIVERSITY OF PETROLEUM & ENERGY STUDIES, DEHRADUN

ACKNOWLEDGMENT

This is to acknowledge with thanks the help, guidance and support that I have received during the Dissertation.

I have no words to express a deep sense of gratitude to the management of **Air India SATS Airport Services Private Limited, Thiruvananthapuram** for giving me an opportunity to pursue my Dissertation, and in particular **Ms. K. Kalaivani** for her able guidance and support.

I must also thank **Mr. Arun Giri** for his valuable support from the organization.

I also place on record my appreciation of the support provided by **Ms Leela Grace** and other staff of **State Central Library, Trivandrum**.

Finally, I also thank **A.R Enterprises** for typing of the manuscript.


Signature

Febsin Anand J
6/132b, Periyavilai, Nithiravilai Post
Kanyakumari, Tamilnadu

Mobile: 8973816645
e-mail: jrfanand@gmail.com

Date: 22/10/2019
Place: Trivandrum

Declaration by the Guide

This is to certify that the Mr /Ms Febsin Anand J a student of (MBA Aviation Management), SAP ID 500066234 of UPES has successfully completed this dissertation report on "21st October 2019" under my supervision.

Further, I certify that the work is based on the investigation made, data collected and analysed by him and it has not been submitted in any other University or Institution for award of any degree. In my opinion it is fully adequate, in scope and utility, as a dissertation towards partial fulfilment for the award of degree of MBA.



KALAIVANI K

Assistant Manager

Learning and Development

Air India SATS Airport Services Private Limited

Trivandrum

Kerala - 695008

Phone: 8714477702

Email: suzykind@gmail.com



Air India SATS Airport Services Private Limited

1 st Floor Panachamootil Square, Airport Rd, Vallakkadavu, Trivandrum, Kerala 695008

Registered Office: Airlines House, 113, Gurudwara Rakabganj Road, New Delhi 110 001

(CIN): U74900DL2010PTC201763

Table of Contents

Acknowledgment	ii
Table of Contents	iv
List of Tables and Illustrations	vi
List of Figures	viii
Executive Summary / Abstract	ix
Chapter 1: Introduction	1
1.1 Overview	1
1.2 Background	2
1.3 Purpose of the Study	4
1.4 Research Hypotheses	4
Chapter 2: Literature Review	6
2.1 Review Area Broad	7
2.2 Review Area Narrow	9
2.3 Factors critical to success of study	15
2.4 Summary	16
Chapter 3: Research Design, Methodology and Plan	23
3.1 Data Sources	17
3.2 Research Design	17
3.3 Survey Questions	20
3.4 Interview Procedures	22
3.5 Data Analysis Procedures	23
Chapter 4: Findings and Analysis	25
4.1 Data Sources	26

4.2 Research Design	53
Chapter 5: Interpretation of Results	59
5.1 Interpretation of Results	59
5.2 Comparison of Results with Assumptions (Hypotheses)	63
Chapter 6: Conclusions and Scope for Future Work	64
Bibliography	66
References	67
Appendix: Interviewer Script	68

List of Tables

Table No	Title	Page No
4.1.1	Showing age of the respondents	27
4.1.2	Showing qualification of the respondents	29
4.1.3	Showing designation of the respondents	29
4.1.4	Showing sex of the respondents	30
4.1.5	Showing marital status of the respondents	31
4.1.6	Showing experience of the respondents	32
4.1.7	Showing present salary of the respondents	32
4.1.8	Showing satisfaction of prohibition provide to the women workers in working area	33
4.1.9	Showing satisfaction of precaution against dangerous fumes	34
4.1.10	Showing satisfaction of precaution against the use of portable electronic lights	35
4.1.11	Showing satisfaction of emergency exit provide in the organization building	36
4.1.12	Showing satisfaction of safety measures provide in case of fire	37
4.1.13	Showing satisfaction of first aid appliance	38
4.1.14	Showing satisfaction of shift hours provide by air India SATS airport services	40
4.1.15	Showing satisfaction of leave facilities provide by the company	42

4.1.16	Showing satisfaction of welfare facilities provide to women employee	43
4.1.17	Showing satisfaction of counselling provide by the mentor	44
4.1.18	Showing satisfaction of career growth in the company	45
4.1.19	Showing satisfaction of grievance settlement system in air India SATS airport services	46
4.1.20	Showing satisfaction of morale influence on production	47
4.1.21	Showing satisfaction of job security in the organization	49
4.1.22	Showing satisfaction of employee self-improvement	50
4.1.23	Showing satisfaction of working environment of air India SATS airport services	51
4.2.1	Showing relationship between salary and shift hours of employees	54
4.2.2	Showing relationship between satisfaction level of prohibition to women workers and welfare of women workers	56
4.2.3	Showing satisfaction level of job security	57
4.2.4	Showing satisfaction level of working environment	58

List of Figures

Figure No	Title	Page No
1.1.1	List of human factors	1
1.4.1	The research process	5
4.1.1	Showing age of the respondents	28
4.1.2	Showing sex of the respondents	31
4.1.3	Showing present salary of the respondents	33
4.1.4	Showing prohibition provide to the women workers of the respondents	34
4.1.5	Showing prohibition provide to the women workers of the respondents	36
4.1.6	Showing safety measures provide in case of fire Of the respondent	38
4.1.7	Showing first aid appliance of the respondent	39
4.1.8	Showing Shift Hours Provide by Air India SATS Airport Services of The Respondent	41
4.1.9	Showing women welfare facilities of the respondent	44
4.1.10	Showing grievance settlement system of the respondent	47
4.1.11	Showing morale influence of the respondent	48
4.1.12	Showing job security of the respondent	49
4.1.13	Showing working environment of the respondent	52

ABSTRACT

The present study in Air India SATS Airport Services Pvt Ltd, Thiruvananthapuram was undertaken to measure the safety by means of human errors and mental welfare. The main object is to analyse the workers satisfaction towards safety and their welfare facilities provided by the company. It helps to know about the various factors determining the labour welfare and awareness facilities. The study helps to assess the perfection of the employee towards safety by means of human factors and psychological welfare measures.

The questionnaire was constructed with multiple choice and the required primary data were collected from the 250 samples. The study period was around two months in the human resource department and work station of the company. The main sources of the data were survey method, observation and through the company promoters' experiences and looking into the various actives Tools used for the study were Simple percentage Analysis, and Chi-Square test. Inferences were made out of these tools and on that basis, findings and suggestions were availed to the company.

Organization can show good performance in safety and welfare measures. It is important for them to carry out their operation effectively and error free. From this research most of this company are satisfied with the safety and the facilities provide by the organization with expectation of a few facilities. From the finding the researcher conclude that the labour welfare facilities and trainings are provided properly, in addition to that the researcher suggested some psychological ideas to improve the concentration towards work.

CHAPTER -I

INTRODUCTION

1.1 Overview

Human factors have grown increasingly popular as the commercial aviation industry realize that human error, rather than mechanical failure, underlies most aviation accidents and incidents. Human factors science or technologies are multidisciplinary fields incorporating contributions from psychology, engineering, industrial design, statistics, operations research, and anthropometry. It is a term that covers the science of understanding the properties of human capability, the application of this understanding to the design, development, and deployment of systems and services, and the art of ensuring successful application of human factor principles into the working environment.

The list of human factors that can affect aviation operations and work performance is broad. They encompass a wide range of challenges that influence people very differently as humans do not all have the same capabilities, strengths, weaknesses, or limitations. Unfortunately, aviation operations tasks that do not account for the vast amount of human limitations can result in technical error and injuries.

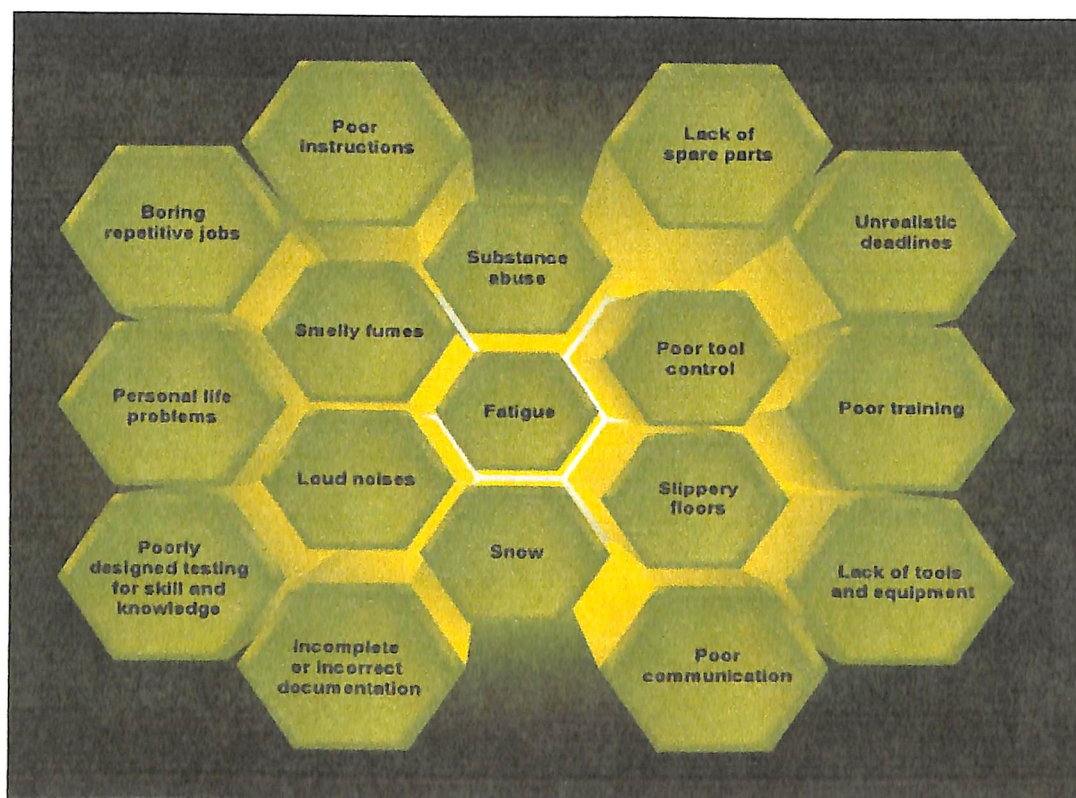


Fig 1.1.1 A list of human factors in aviation

By this study, Airports stand to benefit from first understanding the demands and limitations of the human element operating in the airfield environment to enhance the aviation safety.

This research covers the application of psychological principles, techniques to situations and problems of aviation. It offers an overview of the role psychology plays in aviation, system design, selection and training of workers, characteristics of pilots, safety, and passenger behaviour. It covers concepts of psychological research and data analysis and shows how these tools are used in the development of new psychological knowledge.

1.2 Background

Safety and welfare measures are inevitable to any organization where workers are involved. An organization's responsibility to its employees extends beyond the payment of wages for their services. The employee's safety and welfare on and off the job within the organization is a vital concern of the employer. Providing a safe and healthy environment is a pre-requisite for any productive effort. This research deals with study on the Safety and Human welfare measure provided to the employee at Air India SATS airport Services Private Ltd. Unlike other industries, the employee of Air India SATS airport Services Private Ltd is often exposed to different and new which they may not have been familiar with earlier. The employee shaves to deals huge machinery

The unfamiliarly in the nature of material they handle and the danger involved I handling them make the employees prone to higher degree of risk. Satisfying or fulfilling the safety and security needs of the workers, would give them a better motivation and more time to concentrate on job performance.

A voluntary approach on the part of the management to offer welfare programmers which are over and above what is laid down by the law would boost the morale of the employee and motivate them to perform better. A preliminary study conducted by the researcher with respect to welfare showed that there was scope for improvement in certain areas. Labour welfare entails all those activities of employer which directed towards providing the employee with certain facilities and services in addition to wages or salaries. Labour welfare has the following objectives:

- To provide better life and health to the workers

- To make the workers happy and satisfied to relieve workers from industrial fatigue.
- To improve intellectual, cultural and material conditions of living of the workers.

The basic features of labour welfare measures are as follows: Labour welfare includes various facilities, services and amenities provided to worker for improving their health, efficiency, economic betterment and social status. New welfare measures are added to the existing ones from time to time. Welfare measures may be introduced by the employers, government, employees or any or charitable agency. The purpose of labour welfare is to bring about the development of the whole personality of the worker to make a better workforce. The very logic behind providing welfare schemes is to create efficient, healthy, loyal and satisfied labour force for the organization.

The purpose of providing such facilities is to make their work life better and also to raise their standard of providing such facilities to make their life better and also to raise their standard of living. Some of important of welfare measures are followed: they provide better physical and mental health to worker and thus promote a health work environment facility like housing schemes, medical benefits, and education and recreation facilities for workers families help in raising their standards of living. This makes workers to pay more attention towards work and thus increases their productivity. Employee gets stable labour force by providing welfare facilities. Employee welfare measures increase the productivity of organization and healthy industrial relation thereby maintaining industrial peace.

1.3 Purpose of study

Human error is cited as a major causal factor in most aviation mishaps, including the 15% - 20% that involve maintenance error. Errors can be described as active failures that lead directly to the incident, and latent failures whose presence provokes the active failure.

This study should balance academic and practical applications, focusing on the following key areas:

- Baseline research identifying cognitive characteristics of operating in the airfield at small-, medium-, and large hub airports. What kind of work and skills does the typical airport worker's brain have to do and focus on?
- Mapping existing best practices and mitigation strategies (markings, lighting, signage, procedures)
- Identifying gaps and/or overreliance on existing practices and mitigation strategies. Do we, for example, expect a person to "see" too many warnings at once or are the instances where an operator is given conflicting messages?
- Identifying gaps and shortcomings in unique environments
- Develop and recommend new practices and strategies to make use of underutilized cognitive abilities and/or mitigate those that are overworked

1.4 Research hypothesis

The research process normally consists of a series of steps that the researcher proceeds through from problem description to final conclusion. The first step is usually a period in which ideas are formulated and the literature on the topic reviewed. The first ideas are then formulated in more detail as problems and hypotheses. Some may be very descriptive for example, the prevalence of fear of flying in the population. At other times, the purpose may be to determine the cause of something for example, whether a specific course aimed at reducing fear of flying is in fact effective in doing so.

The next step will be to choose a method well suited for studying the research problem. Sometimes aspects other than the nature of the problem or hypothesis will influence the choice of method for example, practical considerations, tradition, and ethical problems. Within certain disciplines, some methods are more popular than others, and choice of methods may also depend on the training that the researcher has received. In other words, there will likely be many aspects involved when choosing research methods and design in addition to the nature

of the research question. The next step in the research process involves data collection. Data may be quantitative, implying that something is measured or counted that may be processed using statistical methods, or that data may be qualitative, often involving words or text. The majority of research conducted within aviation is based on quantitative data, and this chapter will focus on how to collect, process, and interpret such data. Finally, the chapter tells about the result of study

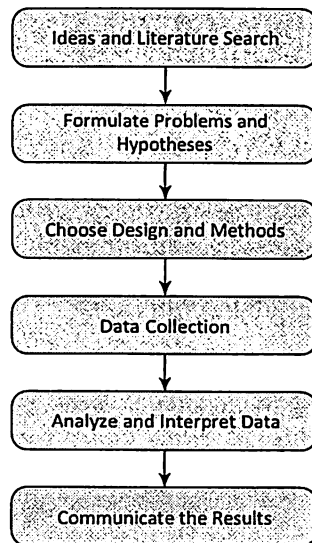


Fig 1.4.1 The research process

CHAPTER – II

LITERATURE REVIEW

There are a large number of scientific journals in psychology, and some of them publish aviation related research. One example is the International Journal of Aviation Psychology, which is an American journal published by Taylor & Francis. Another journal published by the U.S. Federal Aviation Administration (FAA) is the International Journal of Applied Aviation Studies. In addition, a medical journal called Aviation, Space, and Environmental Medicine is published by the Aerospace Medical Association. A number of other psychology journals will publish articles in aviation psychology and other related areas of work and organizational psychology for example, Human Factors, Journal of Applied Psychology, and Military Psychology. Articles from these journals may be accessed through a library. One can also visit the journal's Web site, but it may be necessary to purchase the article, at least the more recent issues. In addition, the FAA has produced a large number of reports over the years that are available online, free of charge. A general literature search using a regular search engine may also result in relevant articles and reports, but it is important to evaluate the source and quality of the information critically.

Before they are published, scientific articles have been through a peer review system. This means that two or three other researchers in the field will review the article. The author then receives the feedback from the reviewers and the editor, and in most cases the article will have to be revised before it is published. Sometimes, the quality of the article is too poor compared to the standards of the journal, and the author is not given the option to revise and resubmit. The journals vary in relation to the proportion of submitted articles that are accepted and how often articles from the journal are cited by other authors.

Research in aviation psychology is also presented at conferences. One of the organizers of such conferences is EAAP (European Association of Aviation Psychology). EAAP is an association of aviation psychologists now more than 50 years old that organizes conferences every 2 years. In addition, the International Symposium in Aviation Psychology is organized every 2 years and is usually held in Dayton, Ohio. Approximately every 3 years, the Australian Association for Aviation Psychology organizes a conference in Sydney. Proceedings are usually published after the conferences, and they include the papers presented at the conference, usually in the form of short articles. These are available for those attending the conference and sometimes also through the Web sites of the organizers. Researchers† often

present their results at a conference before the results appear in a journal, so attending conferences may provide a snapshot of the latest news in the area.

2.1 Review area broad

Indian Aviation Industry

Indian Aviation Industry is one of the fastest growing airline industries in the world. The history of Indian Aviation Industry started in December 1912 with its first domestic air route between Karachi and Delhi. It was opened by the Indian Air Services in collaboration with the UK based Imperial Airways as an extension of London-Karachi flight of the Imperial Airways. Tata Sons Ltd., the first Indian airline, started a regular airmail service between Karachi and Madras three years later without any backing from the Indian government.

During the period of independence, 9 air transport companies were carrying both air cargo and passengers in the Indian Territory. In 1948, the Indian Government and Air India set up a joint sector company, Air India International to further strengthen the Aviation Industry of India. As part of nationalization in 1953 of Indian Airlines (IA) brought the domestic civil aviation sector under the purview of Indian Government. Later till the mid 1990's government owned airlines dominated Indian aviation industry. When the government adopted the Open-sky policy in 1990 and other liberalization policies the Indian Aviation Indian made underwent a rapid and dramatic transformation.

By the year 2000 several private airlines have entered into the aviation business in succession and many more were about to enter into the arena. Indian aviation industry today is dominated by private airlines and low-cost carriers like Deccan Airlines, GoAir, and SpiceJet, etc. And Indian Airlines, the giant of Indian air travel industry, gradually lost its market share to these private airlines. According to the report of CAPA, these budget carriers are likely to double their market share by 2010 one of the highest in the world.

Indian Aviation Industry has been one of the fastest-growing aviation industries in the world with private airlines accounting for more than 75 % of the sector of the domestic aviation market. With a compound annual growth rate (CAGR) of 18 % and 454 airports and airstrips in place in the country, of which 16 are designated as international airports, it has been stated that the aviation sector will witness revival by 2011. In 2009 with increase in traffic movement and increase in revenues by almost US\$ 21.4 million, the Airports Authority of India seems set

to accrue better margins in 2009-10, as per the latest estimates released by the Ministry of Civil Aviation.

This is being primarily attributed because of the increase in the share of revenue from Delhi International Airport Limited (DIAL) and Mumbai International Airport Limited (MIAL). Passengers carried by Indian domestic airlines from January-February 2010 stood at 8,056,000 as against 6,761,000 in the corresponding period of 2009-a growth of 19.2 %, according to a report released by the Ministry of Civil Aviation.

Today Hyderabad International Airport has been ranked amongst the world's top five in the annual Airport Service Quality (ASQ) passenger survey along with airports at Seoul, Singapore, Hong Kong and Beijing. This airport in Hyderabad is managed by a public-private joint venture consisting of the GMR Group, Malaysia Airports Holdings Berhad and both the State Government of Andhra Pradesh and the Airports Authority of India (AAI).

The Indian aviation sector can be broadly divided into three main categories:

- **Scheduled air transport service:** It is an air transport service undertaken between two or more places and operated according to a published timetable. It includes: Domestic airlines, which provide scheduled flights within India and to select international destinations. Spice Jet and IndiGo are some of the domestic players in the industry. International airlines operate from scheduled international air services to and from India.
- **Non-scheduled air transport service:** It is an air transport service other than the scheduled one and may be on charter basis and/or non-scheduled basis. The operator is not permitted to publish time schedule and issue tickets to passengers.
- **Air cargo services:** It is an air transportation of cargo and mail. It may be on scheduled or non-scheduled basis. These operations are to destinations within India. For operation outside India, the operator has to take specific permission of Directorate General of Civil Aviation demonstrating his capacity for conducting such an operation.

Size of the Industry

India is one of the fastest growing aviation markets in the world. A total of 126 airports in the country, which include 17 international airports, 7 custom airports, 80 domestic airports and 28 civil enclaves are managed by The Airport Authority of India (AAI). There are about 449 airports and 1091 registered aircrafts in India today.

Players in Indian aviation industry can be classified into three groups:

- Public players
- Private players
- Start-up players

Aviation sector provides the following types of opportunities:

- Commercial pilot
- Co-pilot
- Air cargo pilot
- Expert cabin crew
- Air traffic controller
- Cabin safety instructor
- In-flight managers
- In-flight base managers
- Cabin services instructor
- Cabin crew Training instructor
- Maintenance controllers
- Licensed aircraft maintenance engineering
- Quality control manager
- Cargo officers
- Guest service agent
- Ground staff

2.2 Review area narrow

Organization profile

Air India SATS (AISATS) is a 50:50 joint venture between Air India Limited, and SATS Limited, a leading gateway services and food solutions provider in Asia. As part of the Indian Government's initiative to upgrade its airports to world-class facilities and attract more airlines to fly into India, AISATS was formed with the vision to provide world-class airport services in ground and cargo handling that exceed customers' expectations.

Since the start of its operations in 2008, AISATS has provided hassle-free and comprehensive solutions to its customer airlines in international airports at Bengaluru, Delhi, Hyderabad, Mangalore and Trivandrum. Currently employing over 7,000 staff, AISATS offers

end-to-end ground handling services such as passenger and baggage handling, ramp handling, aircraft interior cleaning, load control and flight operations, and cargo handling services for general, perishable, transshipment, express courier and special cargo. In the past year, AISATS' Cargo Airfreight Terminal in Bengaluru won the "Air Cargo Terminal Operator" for the 4th year running from the Indian Chamber of Commerce. AISATS' customers also won various "best performing" station awards from their respective HQs as well. AISATS is ISAGO (IATA Safety Audit for Ground Operations) and ISO 9001:2008 certified.

Passenger Handling

With the right people having the right expertise that meet our customers' needs, we provide check in services, gate arrival & departure services along with staffing the transfer & customer service counters



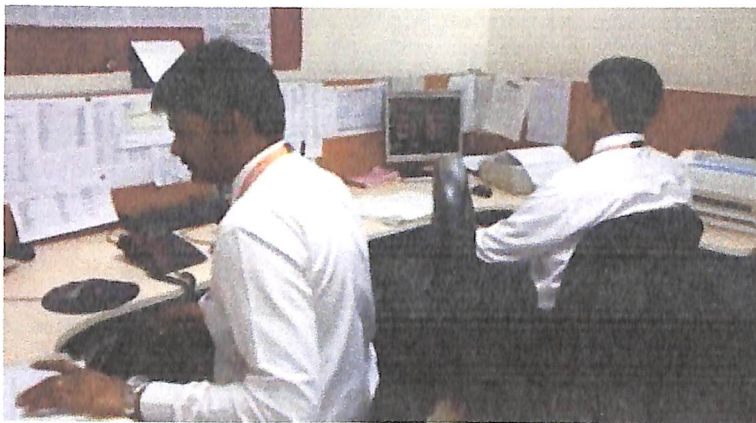
Baggage handling

Working as a liaison between airlines & passengers, we at AISATS ensure proper & efficient delivery, offloading, prioritizing & transferring of your baggage.



Load control and flight operations

Our well-trained staff undertakes preparation & distribution of flight documents (loading instructions, load sheets, weight & balance charts, etc.) & communicates the same to the carrier. In addition to this, flight movements are also monitored.



Ramp Operations, Cabin Cleaning

We provide ramp/apron services such as marshalling, towing, air conditioning, air start units, handling gate checked baggage, ground power, passenger steps, etc. We also provide lavatory & water services.



Cargo Handling

Besides passenger and ramp services, AISATS also provide cargo services at Bengaluru, Delhi (cargo supervision only), and Thiruvananthapuram (export cargo only). At Bengaluru, AISATS has its own Airfreight Terminal, which is Good Distribution Practices (GDP) and TAPA (Transported Asset Protection Association) Class A certified. The facility, which is equipped to handle all types of cargo, has a capacity of 210,000 tonnes per year and was the first in India to be equipped with Automated Storage and Retrieval System (ASRS), Elevated Transfer Vehicle (ETV), Very Narrow Aisle (VNA) equipment, and carton clamps for its forklifts.



Perishable Cargo Handling

A One stop shops for all cargo needs, AISATS COOLPORT is India's 1st integrated on-airport perishable cargo handling centre at Kempegowda International Airport Bengaluru. The state-of-the-art, 11,000sqm facility has a handling capacity of 40,000 tons per annum. It has comprehensive cold storage solutions with 17 dedicated cold rooms and has the capability to handle a wide range of perishable commodities including flowers, pharmaceutical products, frozen food products, seafood, poultry, meat and fresh produce such as vegetables and fruits. It will ensure end to end cold chain solution in India.



Handling Charter, VIP And Diverted Flights

We bring to you a host of comprehensive services including special handling of Passenger & Ramp Services for Business Jets, Ashco Freighters and Charter Flights. Our top-notch resources and skilled manpower ensure a holistic approach towards handling services right from obtaining requisite approvals from regulatory authorities for provision of all requested orders at the airport to including assisting in slot approvals, payments to the Airport Operator/Airport Authority of India.



Meet & Assist Services

For passengers who require personalized assistance through the airport controls, please do let us know. Our staff is well-trained to provide the highest standards to service and to cater to your needs right from the time you reach the airport till you depart on your flight and once you disembark from your flight till you leave the airport.



Automated Exterior Aircraft Cleaning

Air India SATS Airport Service Private Limited brings to India Automated Exterior Aircraft cleaning facility at Indira Gandhi International Airport, Delhi to enhance aircraft exterior cleaning experience of the airline customers. The cutting-edge technology will improve the quality of exterior cleaning and will significantly reduce number of resources and man hours deployed during conventional manual cleaning. This specially designed for narrow body aircraft has built in safety features designed to prevent accidental personal injury or aircraft damage.



2.3 Factors critical to success of study

Critical success factor is an element of organizational activity which is central to its future success. Critical success factors may change over time, and may include items such as product quality, employee attitudes, manufacturing flexibility, and brand awareness.

Critical success factors are normally identified in such areas as production processes, employee and organization skills, functions, techniques, and technologies. The identification and strengthening of such factors may be similar.

The factors that are critical for this research as follows:

- Skills and Knowledge
- Communication
- Using the Right Methodology
- Talking to the Right Person
- Briefing Interviewers & Moderators
- Note Taking or Transcripts
- Reading Transcripts
- Qualitative Analysis
- Planning and process

2.4 Summary

During the Crimean War, far more British soldiers died in field hospitals than on the battlefield due to various infections and poor hygienic conditions. Florence Nightingale discovered these problems and implemented several reforms to improve health conditions in the field hospitals. To convince the health authorities about the benefits of hygiene interventions, she used statistics, including pie charts, to demonstrate how the mortality rates of the hospitals changed under different conditions (Cohen 1984). She also demonstrated how social phenomena could be objectively measured and analysed and that statistics were important tools to make a convincing argument for hospital reforms.

The main topic of this chapter has been related to how we can gain new knowledge and about important research requirements concerning methods, design, analyses, and conclusions. Research methods and statistics are important tools when a phenomenon is investigated and the results presented to other.

CHAPTER – III

RESEARCH DESIGN, METHODOLOGY AND PLAN

The purpose of research is to gain new knowledge. In order to be able to trust new findings, it is important that scientific methodology is used. The tools that researchers use to conduct research should be described in sufficient detail so that other researchers may conduct and replicate the study. In other words, an important principle is that the findings should be replicable, which means that they are confirmed in new studies and by other researchers. There are several scientific methods available, and the most important aspect is that the methods are well suited for exploring the research question. Sometimes, the best choice is to use an experiment, whereas at other times a survey may be the best choice.

Research ideas may come from many sources. Many researchers work within an area or research field, and a part of their research activity will be to keep updated on unresolved questions and unexplored areas. Other times, the researcher will get ideas from his or her own life or things that happen at work, or the researcher may be asked to explore a specific problem.

Research can be categorized in many ways for example, basic and applied research. In basic research, the main purpose is to understand or explain a phenomenon without knowing that these findings will be useful for something. In applied research it is easier to see the possibilities for using the research findings for something. Frequently, the boundaries between these two types of research will be unclear, and basic research may later be important as a background for applied research and for the development of products and services. As an example, basic research about how the human brain perceives and processes information may later be important in applied research and in the design of display systems or perhaps for developing tests for pilot selection.

Research should be free and independent. This means that the researcher should be free to choose research methods and to communicate the results without any form of censorship. To what extent the researcher is free to choose the research problem is partly dependent upon where the researcher works; however, frequently one important practical limitation is lack of funding. Even though the researcher may have good ideas for a project and have chosen appropriate methods, the project may not receive any funding.

3.1 Data Sources

The questionnaire survey was chosen to be the method of collecting data in this research, since the questionnaire is probably the most widely used data collection technique for conducting surveys. Questionnaires have been widely used for descriptive and analytical surveys in order to find out the facts, opinions and views. It enhances confidentiality, supports internal and external validity, facilitates analysis, and saves resources. Data are collected in a standardized form from samples of the population. The standardized form allows the researcher to carry out statistical inferences on the data, often with the help of computers. The used questionnaire has some limitations such as: it must contain simple questions, no control over respondents and respondents may answer generally.

3.2 Research Design

The research design used for this study is descriptive in nature. It aims at describing safety and welfare among workers in Air India SATS, Trivandrum.

Survey Method

The research used a technique of gathering first set of information by asking question to the respondent directly through structure questioners.

Sources of Information

The data for study has been collected from both primary sources and secondary sources.

Primary Data

The primary data was collected through questionnaire and also through a few interviews. These interviews helped to get a clear insight into subject.

Secondary Data

Secondary data was collected from books and records maintained by personal department and through library sources.

Sample Size

Research selected altogether 50 respondents for the study that is from Air India SATS at Trivandrum.

Statistical Tools Used

Analysis of the data and interpretation is done through

- Simple Percentage Analysis
- Chi- Square
- ANOVA

Simple Percentage Analysis

This method is used to simplify the number through the use of percentage. The data are reduced in a standard form with base equal to 250 which facilitates relative comparison.

Chi- Square Test

It is a statistical measure used in the context of sampling analysis for comparing a variance to a theoretical variance. It is often used to judge the significance at population variance. Hypotheses are used here.

- ***Null hypothesis (H₀)***

A hypothesis is set during exploratory research and tested conclusion researcher should state the null hypothesis.

- ***Alternative hypothesis (H_a)***

In such a way that its rejection leads to the acceptance of the desired statement.

Chi-square is useful to verify the hypothesis. It was introduced by Karl Pearson in 1890. The research has null hypothesis. This can be calculated using a formula:

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

Where,

O – Observed frequency

E – Expected frequency

RT – Row total

CT – Column total

T - Total number of observations

Table value is found, at 5 % level of significance and for the available degrees of freedom.

Degree of freedom = (R-1) (C-1)

Where, R = No. of rows, C = No. of columns

If the calculated value is greater than the table value null – hypothesis is rejected otherwise accepted.

ANOVA

Analysis of variance (Abbreviated as ANOVA). The ANOVA technique enables us to perform this simultaneous test and as such is considered to be an important tool of analysis in the hands of a researcher. The ANOVA technique is important in the context of all those situations where we want to compare more than two populations.

$x_1, x_2, x_3, \dots, x_u$

Charts

The researcher had used bar charts and pie-charts for representing a data, Bar charts consists of two axis X axis & Y axis. In these two areas we give the no. of respondents and their percentage respectively.

3.3 Survey Questions

1. Name (Optional):

2. Age

a) Less than 20 b) 21-25 c) 26-30 d) 31-35 e) 36-40 f) 40 & above

3. Qualification:

a) Up to 10 b) +2 c) ITI d) Diploma e) UG f) PG

4. Designation:

a) Unskilled worker b) Skilled worker c) Supervisor d) Executive

5. Gender

a) Male b) Female

6. Marital status:

a) Single b) Married

7. How long you been working in the Organization?

a) Less than 1 year b) 1 year-3 year c) 3 year-7 year d) 7 year-10 year F) Above 10 year

8. Present Salary

a) Below 10000 b) 10001-14000 c) 14001-18000 d) 18001-25000 e) Above 25000

9. Are you satisfied with the prohibition provide to the women worker's in working area?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

10. Are you satisfied with the precaution against dangerous fumes?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

11. Are you agree with proper precautions against the use of portable electric light in Working area?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

12. Are you satisfied with the emergency exit provide in the organization Building?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

13. Are you satisfied with the safety measures provide by the Organization in case of fire?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

14. Are you satisfied with the first aid appliance provide by the Organization?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

15. Are you satisfied with the shift hours provide by the Air India SATS?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

16. Are you satisfied with the leave facilities provide by the Organization?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

17. Are you satisfied with the welfare facilities provide to the women employee?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

18. Are you satisfied with the counselling provide by the mentor?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

19. Are you satisfied with the organization support for your career growth?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

20. Specify your option about grievance settlement system in Air India SATS?

a) Highly Efficient b) Efficient c) Neutral d) Sufficient f) Not Sufficient

21. Do you feel your morale is directly influence on production?

a) Yes b) No

22. Are you satisfied with organization job security?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

23. Does the organization support towards employee self-improvement?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

24. Are you satisfied with the working environment of Air India SATS?

a) Highly Satisfied b) Satisfied c) Neutral d) Dissatisfied f) Highly Dissatisfied

25. If you suggest any other Safety & welfare measures, enumerate please

1)

2)

3.4 Interview Procedures

An interview can be used for personnel selection and as a data collection method. The interview may be more or less structured in advance; that is, the extent to which the questions are formulated and the order can be determined in advance. When exploring new areas or topics, it is probably best for the questions to be reasonably open; at other times, specific questions should be formulated and, in some instances, both the questions and answering options will be given.

If the questions are clearly formulated in advance, it will probably be sufficient for the interviewer to write down the answers. During extensive interviews, it may be necessary to use a tape recorder, and the interview will have to be transcribed later. An interview is obviously more time consuming to process than a questionnaire, but probably more useful when complex issues have to be addressed or new themes explored. It may therefore be wise to conduct some interviews with good informants before developing a questionnaire.

Before the interview begins, an interview guide with all the questions is usually constructed, and if multiple interviewers are used, they should all receive the necessary training so that the interviews are conducted in the same way. It is also important that interviewers are aware of the possible sources of error in the interview and how the interviewer may influence the informants with his or her behaviour.

3.5 Data Analysis Procedures

The main objective of this study is to figure out the common success factors or critical success factors of this study project and to assess the relative importance of those factors from the viewpoint of employers. The present condition of a management level in organisation is good and inadequate. This study investigates the human factors that encountered success in operations in order to understand the reason for these success factors and to make recommendation that help achieve the further achievement.

The questionnaires are developed based on the well-known general success factors and the ten knowledge areas of Aviation Management Body of Knowledge. The respondents were asked to fill up the questionnaires in accordance with the level of agreement based on their experiences.

The survey was sent via email to the various department of AISATS for 250 respondents. 125 respondents out of 250 answered and filled up the questionnaires and then they sent back by email. 63 respondents were asked to answer the questionnaires by using telephone conversation. The total respondent of this survey is 188 out of 250 respondents. Therefore, the respondent ratio of this survey was 77%. This chapter discusses the results that have been deduced from a field survey of 188 questionnaires that responded out of 250 questionnaires. This chapter is organized by three sections. Section one describes the profiles and all necessary information about the respondents, section two is to identify and rank the most common success factors affected on project with the percentage frequency distribution method and the relative importance index method.

Data Processing

The quantitative data are being used in this dissertation. Quantitative analysis is concerned with numerical measurement and mathematical models to the test hypotheses, support the view of the positivist paradigm that there is an objective reality that can be accessed and measured. Data will be analysed by using the windows-16 program and Microsoft Excel 2016 operating system.

Due to sample size restrictions, the types of quantitative methods in this research area are limited. The questionnaire quantitative data analysis was done by using the following the quantitative data analysis procedures outlined below.

- Data tabulation

- Descriptive data
- Data disaggregation
- Statistical method for ranking data

1) Data tabulation

These procedures give a comprehensive picture of what the data looks like and assists the researcher in identifying patterns. A frequency distribution is an organized tabulation of the number of individuals or scores located in each category. This will help to determine:

- If scores are entered correctly
- If scores are high or low
- How many are in each category
- The spread of the scores

2) Descriptive data

A descriptive refers to calculations that are used to “describe” the data set. The most commonly descriptive used are:

- Mean – the numerical average of scores for a particular variable
- Minimum and maximum values – the highest and lowest value for a particular variable
- Median – the numerical middle point or score that cuts the distribution in half for a particular variable

3) Data disaggregation

After tabulating the data, this procedure continues to explore the data by disaggregating it across different variables and subcategories of variables. Crosstabs allow you to disaggregate the data across multiple categories. The procedure can also disaggregate the data by subcategories within a variable. This allows to take a deeper look at the units that make up that category.

4) Statistical method for ranking data

The main objective of this dissertation is to rank the critical success factor for this study project. Therefore, it requires adequate method to rank those success factors. The Relative Importance Index is used to rank in this dissertation because this method is possible to cross-compare the relative importance of the factors that the employers have faced in the field.

CHAPTER – IV

FINDINGS AND ANALYSIS

An important part of the research process occurs when the results are processed. If the study includes only a few subjects, then it is easy to get an overview of the findings. However, in most studies, a large number of participants and variables are included, so a tool is clearly needed to get an overview. Suppose that we have sent out a questionnaire to 250 organisation's members to map out what they think about their working environment. Without statistical techniques, it would be almost impossible to describe the opinions of these workers.

Statistics can help us with three things:

- sampling (how people are chosen and how many people are required)
- describing the data (graphical, variation, and the most typical response)
- drawing conclusions about parameters in the population.

In most cases, we do not have the opportunity to study the entire population and a smaller group needs to be sampled. Most statistical methods and procedures assume a random selection of subjects, which means that all participants initially have equal chances to be selected. There are also other ways to sample subjects; for example, stratified samples may be employed where the population is divided into strata and then subjects are randomly selected from each stratum. These sampling methods are primarily used in surveys where one is interested in investigating, for example, how many people sympathize with a political party or the extent of positive attitudes toward environmental issues. An application of statistics is thus to determine how the sampling should be done and, not least, how many people are needed in the study.

After the data are collected, the next step is to describe the results. There are many possibilities, depending on the problem and what types of data have been collected. The results may be presented in terms of percentages, rates, means, or perhaps a measure of association (correlation). Graphs or figures for summarizing the data could also be used.

The third and last step is the deduction from the sample to the population. Researchers are usually not satisfied with just describing the specific sample, but rather want to draw conclusions about the entire population. Conclusions about the population are based on findings observed in a sample. One way to do this is through hypothesis testing. This means

that a hypothesis about the population is formulated that can be tested using results from the sample.

The second procedure involves estimating the results in the population on the basis of the results in the sample. Suppose we are interested in knowing the proportion of people with fear of flying. After conducting a study measuring this attitude about flying, we will have a concrete number: the proportion of our subjects who said they were afraid of flying. Lacking any better estimates, it would then be reasonable to suggest that, among the population at large, approximately the same proportion as we have observed in the sample has a fear of flying. In addition, we might propose an interval that is likely to capture the true proportion of people with fear of flying in the population. These intervals are called confidence intervals. If many people are included in the sample, then these intervals are smaller; that is, the more people who are in our sample, the more accurate is our estimate.

4.1 Descriptive statistics

The most common measure of central tendency is the arithmetic mean. This is commonly used when something is measured on a continuous scale. The arithmetic mean is usually denoted with the letter M (for “mean”) or X . An alternative is the median, which is the value in the middle, after all the values have been ranked from lowest to highest. This is a good measure if the distribution is skewed for example, if the results include some very high or very low values. The mode is a third indicator of central tendency, which simply is the value with the highest frequency. Thus, it is not necessary that the variable be continuous to use this measure of central tendency.

In addition to a measure of the most typical value in the distribution, it is also important to have a measure of variation. If we have calculated the arithmetic mean, it is common to use the standard deviation as a measure of variation. Formulated a little imprecisely, the standard deviation is the average deviation from the mean. If results are normally distributed—that is, bell shape and we inspect the distribution and move one standard deviation above and one standard deviation below the average, then about two-thirds of the observations fall within that range. Including two standard deviations on both sides of the mean, then about 95% of the observations will be included. The formulas for calculating the arithmetic mean and standard deviation are

$$\bar{X} = \frac{\sum_{i=1}^N X_i}{N}$$

$$SD = \sqrt{\frac{\sum_{i=1}^N (X_i - \bar{X})^2}{N-1}}$$

where

N = sample size

X_i = test score

\bar{X} = mean test score

Table No 4.1.1 Showing Age of The Respondents

Synod	Age	No. of the Respondents	Percentage (%)
1	Less than 20	24	9.6
2	21-25	37	14.8
3	26-30	79	31.6
4	31-35	46	18.4
5	36-40	36	14.4
6	40 & Above	28	11.2
Total		250	100

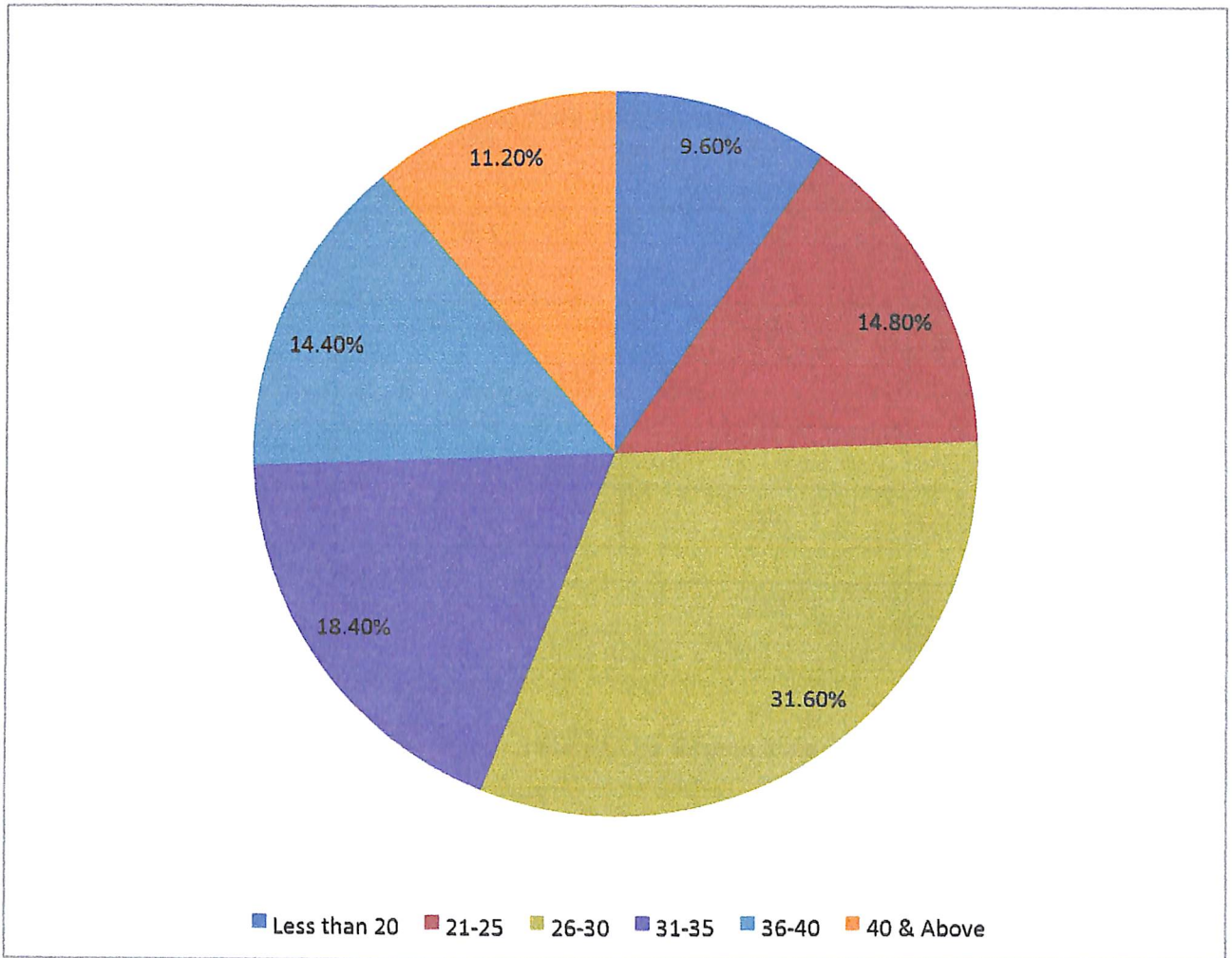


Figure No: 4.1.1 Showing Age of The Respondents

Table No 4.1.2 Showing Qualification of The Respondents

S. No	Qualification	No. of the Respondents	Percentage (%)
1	Up to 10 th	80	32
2	+2	64	25.6
3	ITI	7	2.8
4	Diploma	12	4.8
5	UG	69	27.6
6	PG	18	7.2
Total		250	100

Table No 4.1.3 Showing Designation of The Respondents

S. No	Designation	No. of the Respondents	Percentage (%)
1	Unskilled Worker	107	42.8
2	Skilled worker	84	33.6
3	Supervisor	29	11.6

4	Executive	30	12
Total		250	100

Table No 4.1.4 Showing Gender of The Respondents

S. No	Sex	No. of the Respondents	Percentage (%)
1	Male	102	40.8
2	Female	148	59.2
Total		250	100

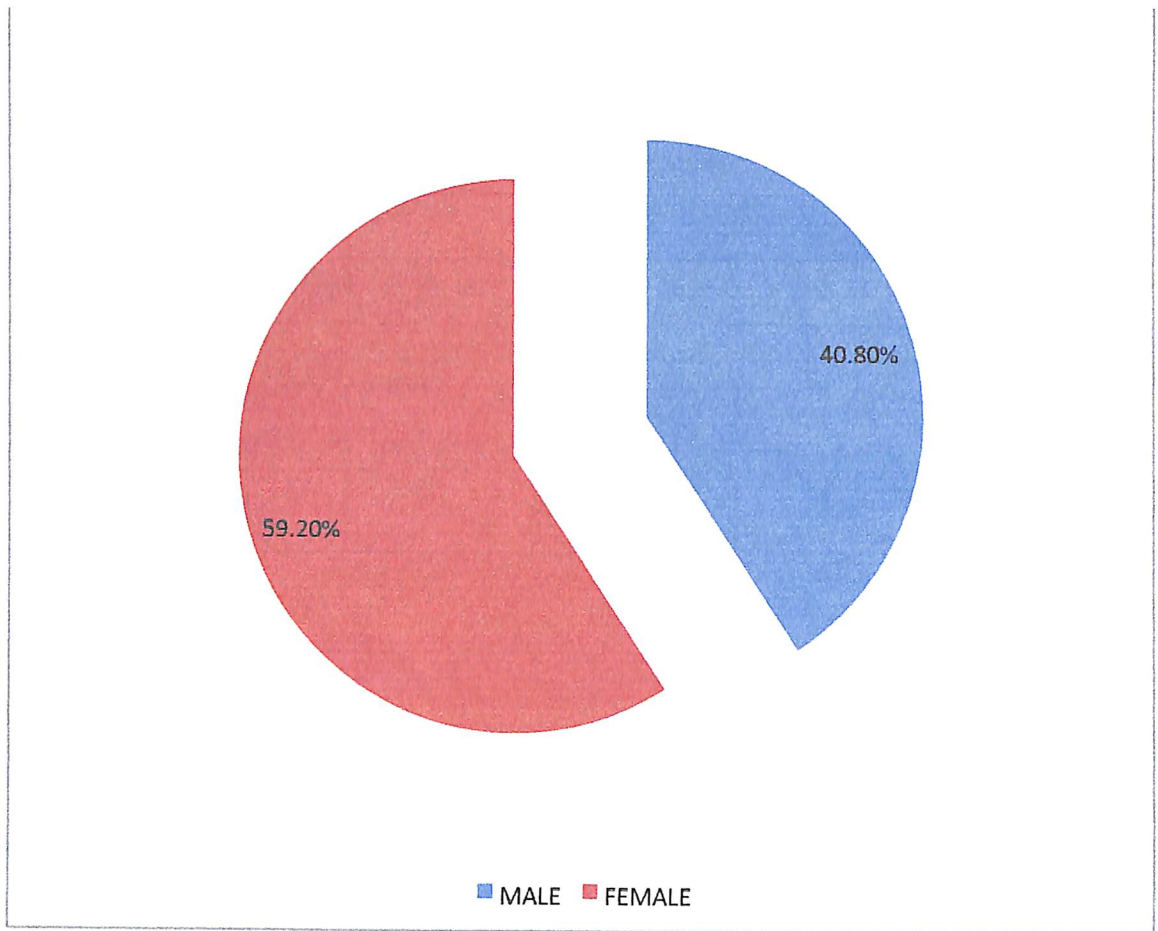


Figure No:4.1.2 Showing Sex of The Respondents

Table No 4.1.5 Showing Marital Status of The Respondents

S. No	Marital Status	No. of the Respondents	Percentage (%)
1	Single	137	54.2
2	Married	113	45.2
Total		250	100

Table No 4.1.6 Showing Experience of The Respondents

S. No	Experience	No. of the Respondents	Percentage (%)
1	Less than 1 Year	129	51.6
2	1-3 Year	55	22
3	3-7 Year	38	15.2
4	7-10 Year	21	8.4
5	10 & Above	7	2.8
Total		250	100

Table No 4.1.7 Showing Present Salary of The Respondents

S. No	Present Salary	No. of the Respondents	Percentage (%)
1	Below 10000	65	26
2	10001-14000	43	17.2
3	14001-18000	49	20.6
4	18001-25000	63	25.2
5	Above 25000	28	11.2
Total		250	100

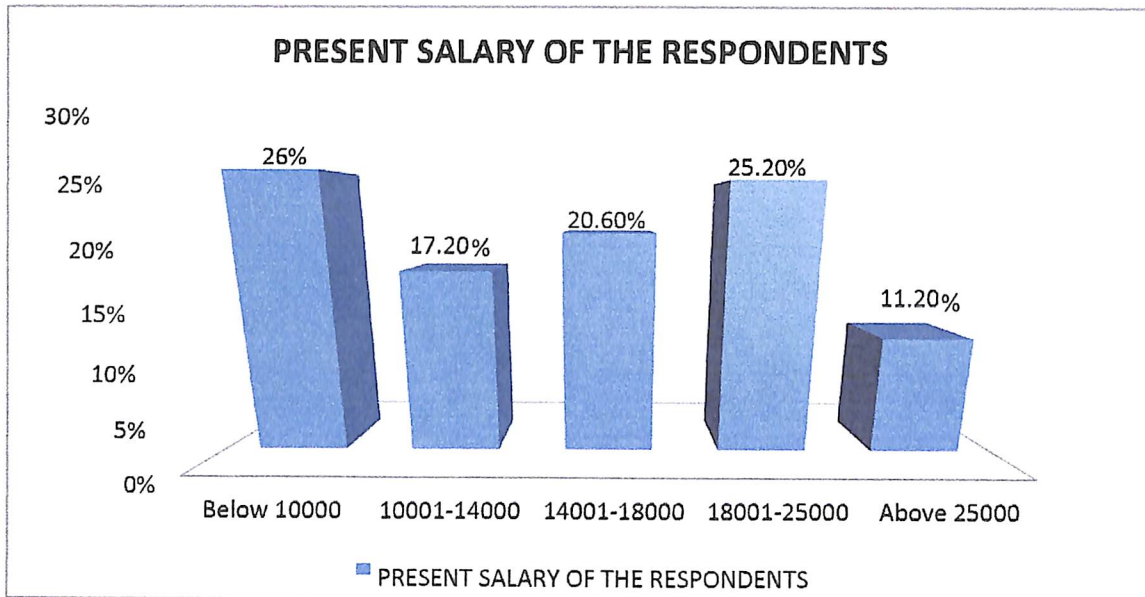


Figure No: 4.1.3 Showing Present Salary of The Respondents

Table No 4.1.8 Showing Satisfaction of Prohibition Provided to The Women Working Area

S. No	Opining	No. of the Respondents	Percentage (%)
1	Highly Satisfied	77	30.8
2	Satisfied	54	21.6
3	Neutral	69	27.6
4	Dissatisfied	29	11.6
5	Highly Dissatisfied	21	8.4
Total		250	100

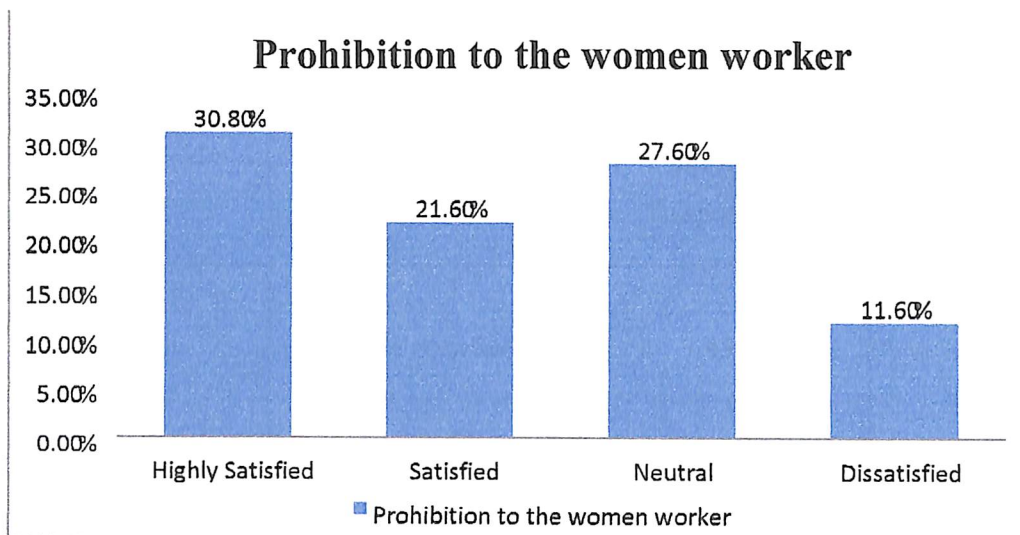


Figure No: 4.1.4 Showing Prohibition Provide to the Women Workers of the Respondents

Table No 4.1.9 Showing Respondents Satisfaction of Precaution Against Dangerous Fumes

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	105	42
2	Satisfied	79	31.6
3	Neutral	24	9.6
4	Dissatisfied	32	12.8
5	Highly Dissatisfied	10	4
Total		250	100

Table No 4.1.10 Showing Respondents Satisfaction of Precaution Against the Use of Portable Electronic Lights

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	45	18
2	Satisfied	88	35.2
3	Neutral	63	25.2
4	Dissatisfied	38	15.2
5	Highly Dissatisfied	16	6.4
Total		250	100

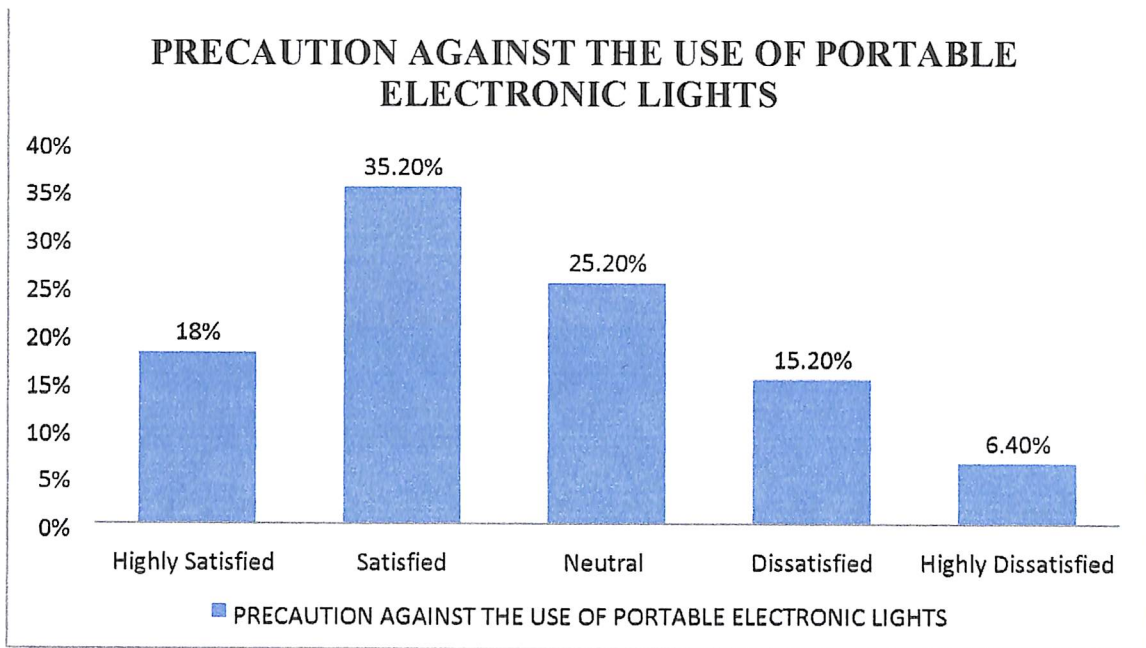


Figure No: 4.1.5 Showing Prohibition Provide to the women workers of the respondents

Table No 4.1.11 Showing Respondents Satisfaction of Emergency Exit

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	75	30
2	Satisfied	113	45.2
3	Neutral	42	16.8
4	Dissatisfied	15	6
5	Highly Dissatisfied	5	2
Total		250	100

Table No 4.1.12 Showing Respondents Satisfaction of Safety Measures

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	75	30
2	Satisfied	90	36
3	Neutral	62	24.8
4	Dissatisfied	2	0.8
5	Highly Dissatisfied	21	8.4
Total		250	100

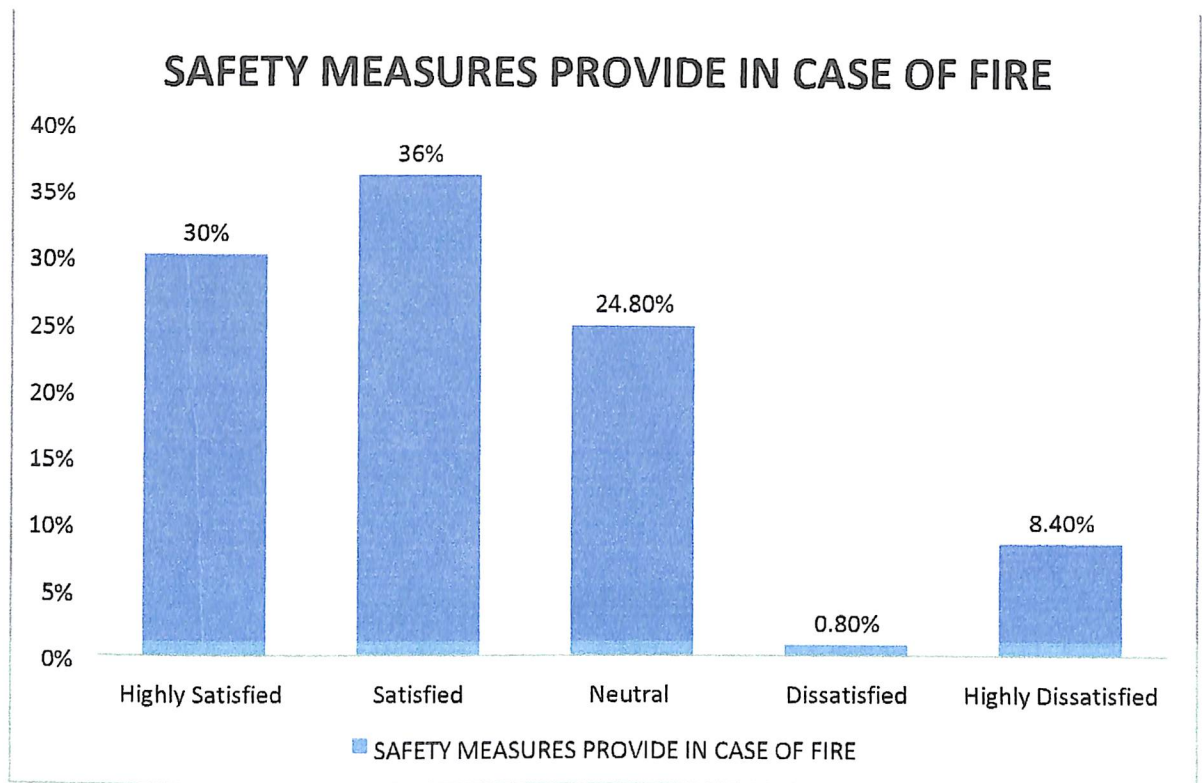


Figure No: 4.1.6 Showing Safety Measures Provide in Case of Fire

Table No 4.1.13 Showing Respondents Satisfaction of First Aid Appliance

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	72	28.8
2	Satisfied	145	58
3	Neutral	19	7.6
4	Dissatisfied	10	4

5	Highly Dissatisfied	4	1.6
Total		250	100

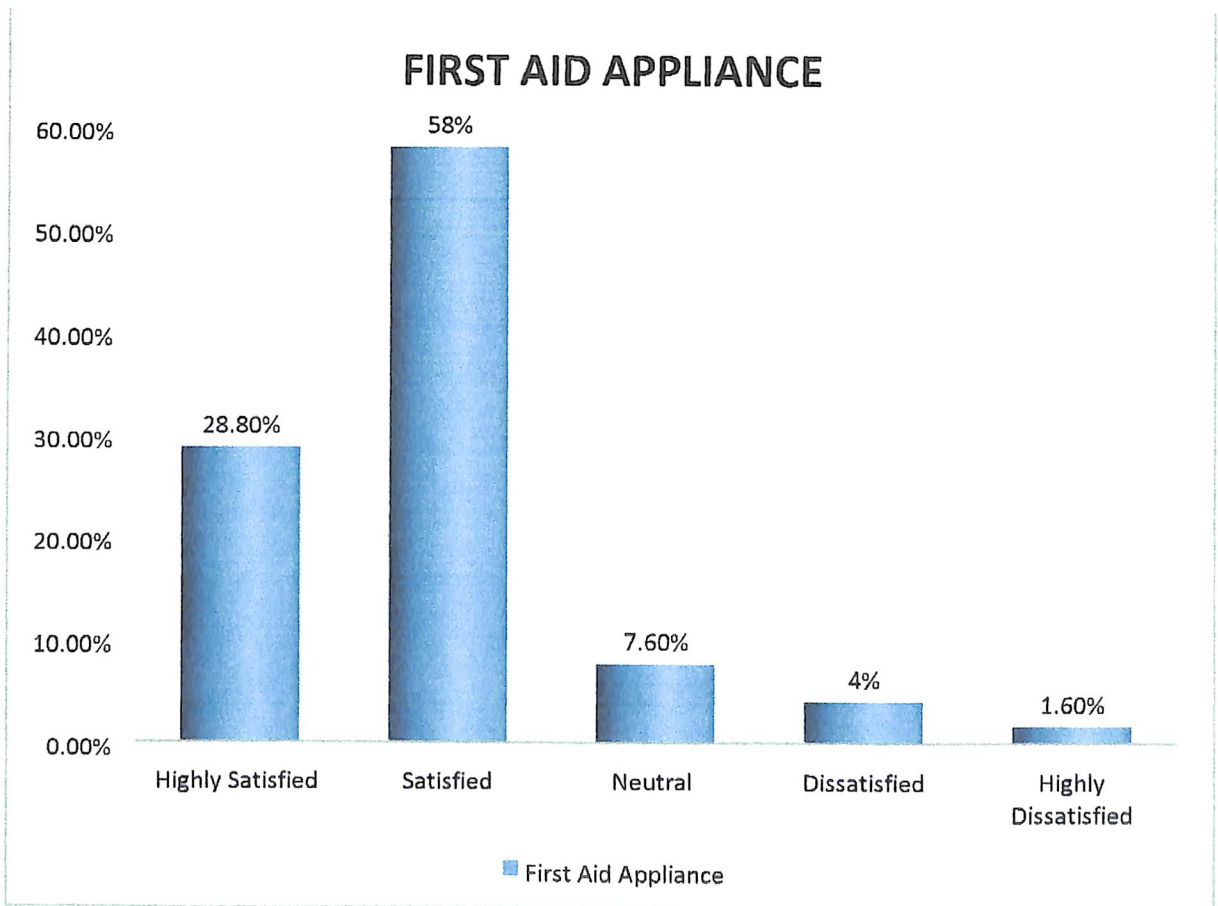


Figure No: 4.1.7 Showing First Aid Appliance of The Respondent

Table No 4.1.14 Showing Respondents Satisfaction of Shift Hours

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	63	25.2
2	Satisfied	55	22
3	Neutral	47	18.8
4	Dissatisfied	50	20
5	Highly Dissatisfied	35	14
Total		250	100

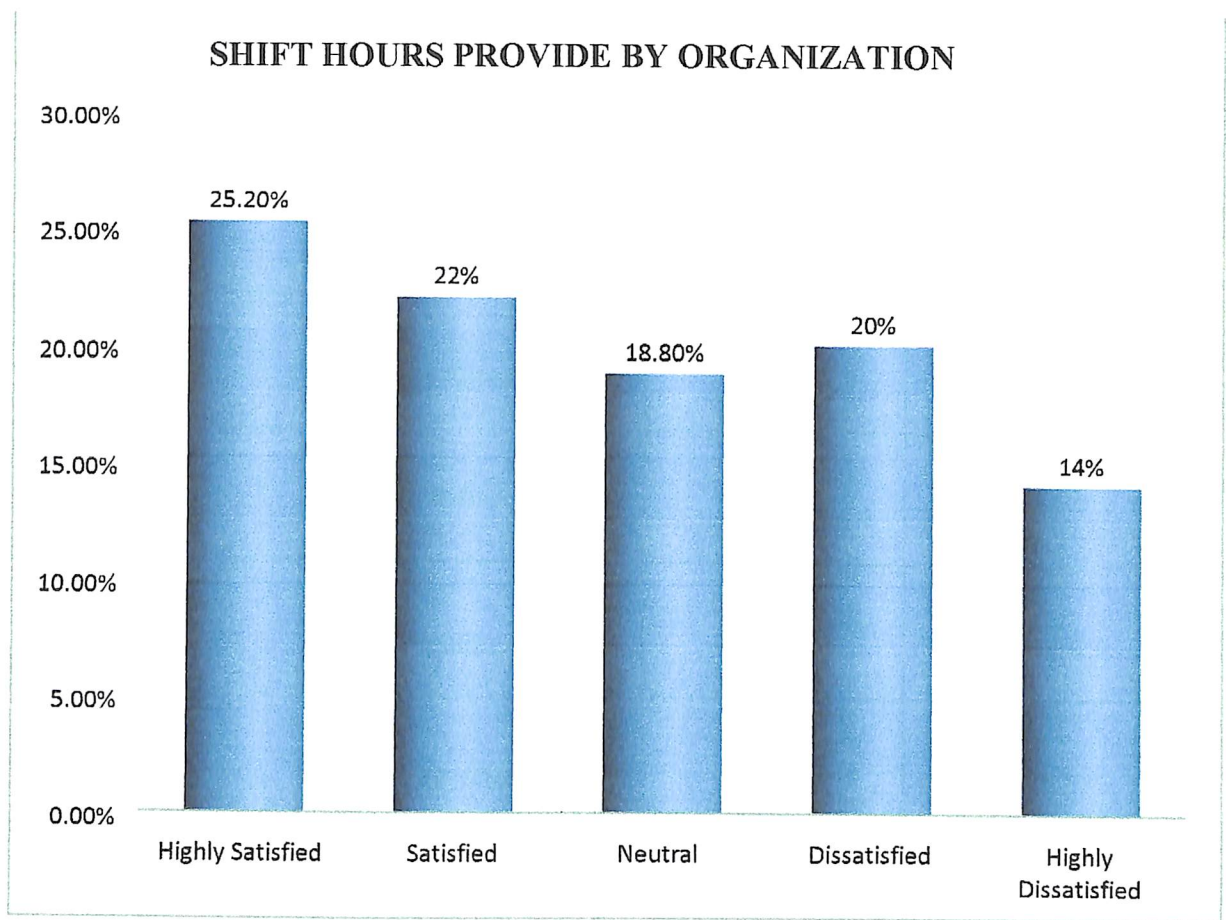


Figure No: 4.1.8 Showing Shift Hours Provide by Respondents

Table No 4.1.15 Showing Respondents Satisfaction of Leave Facilities

S.No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	97	38.8
2	Satisfied	93	37.2
3	Neutral	37	14.8
4	Dissatisfied	8	3.2
5	Highly Dissatisfied	15	6
Total		250	100

Table No 4.1.16 Satisfaction of Welfare Facilities Provide to Women Employee

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	64	25.6
2	Satisfied	50	20
3	Neutral	55	22
4	Dissatisfied	55	22
5	Highly Dissatisfied	26	10.4
Total		250	100

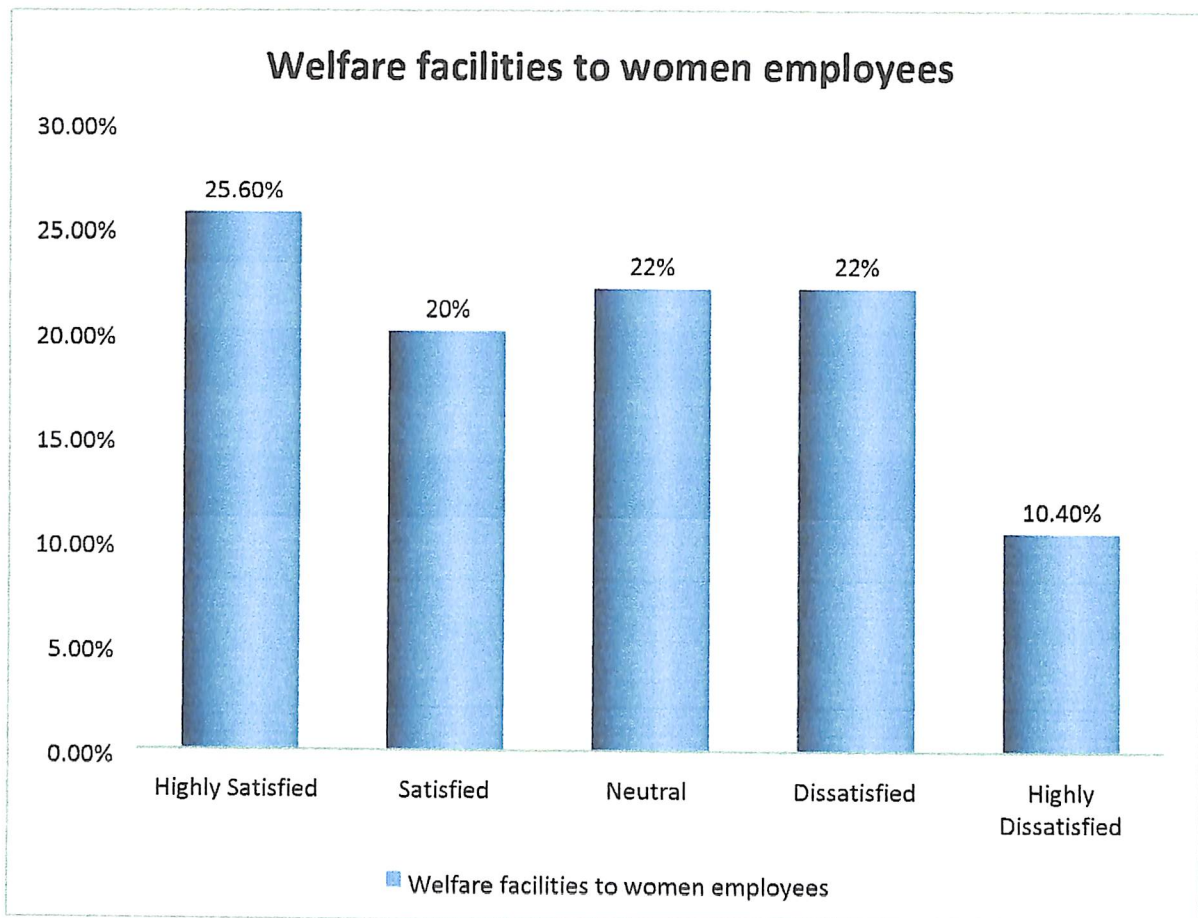


Figure No: 4.1.9 Showing Women Welfare Facilities of The Respondent

Table No 4.1.17 Showing Respondents Satisfaction Opinion About Counselling Provide by The Mentor

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	39	15.6
2	Satisfied	52	20.8
3	Neutral	19	7.6

4	Dissatisfied	73	29.2
5	Highly Dissatisfied	67	26.8.
Total		250	100

Table No 4.1.18 Showing Respondents Opinion Regarding Career Growth

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	73	29.2
2	Satisfied	88	35.2
3	Neutral	46	18.4
4	Dissatisfied	29	11.6
5	Highly Dissatisfied	14	5.6
Total		250	100

Table No 4.1.19 Showing Respondents Satisfaction of Grievance Settlement System

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Efficient	62	24.8
2	Efficient	95	38
3	Neutral	46	18.4
4	Sufficient	30	12
5	Not Sufficient	17	6.8
Total		250	100

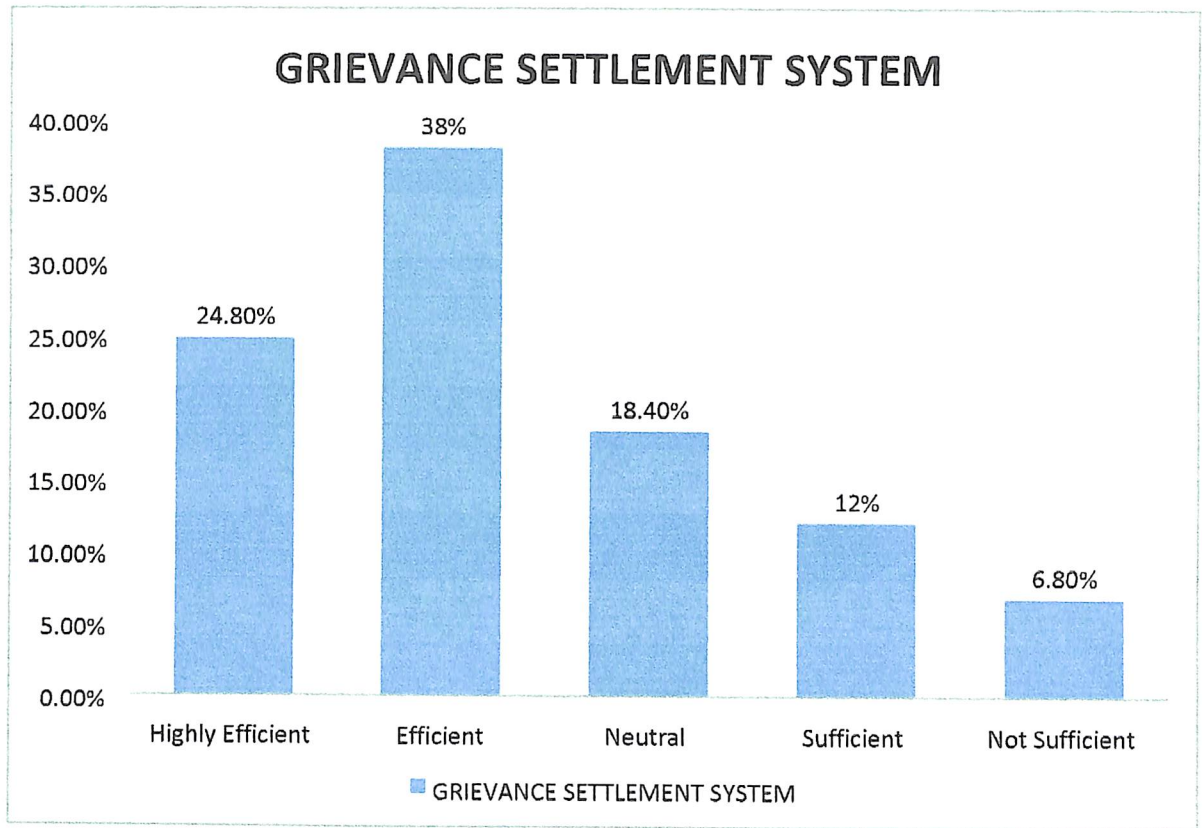


Figure No: 4.1.10 Showing Grievance Settlement System of The Respondent

Table No 4.1.20 Showing Respondents Satisfaction of Morale Influence on Production

S. No	Opinion	No. of the Respondents	Percentage (%)
1	YES	91	36.4
2	NO	159	63.6
Total		250	100

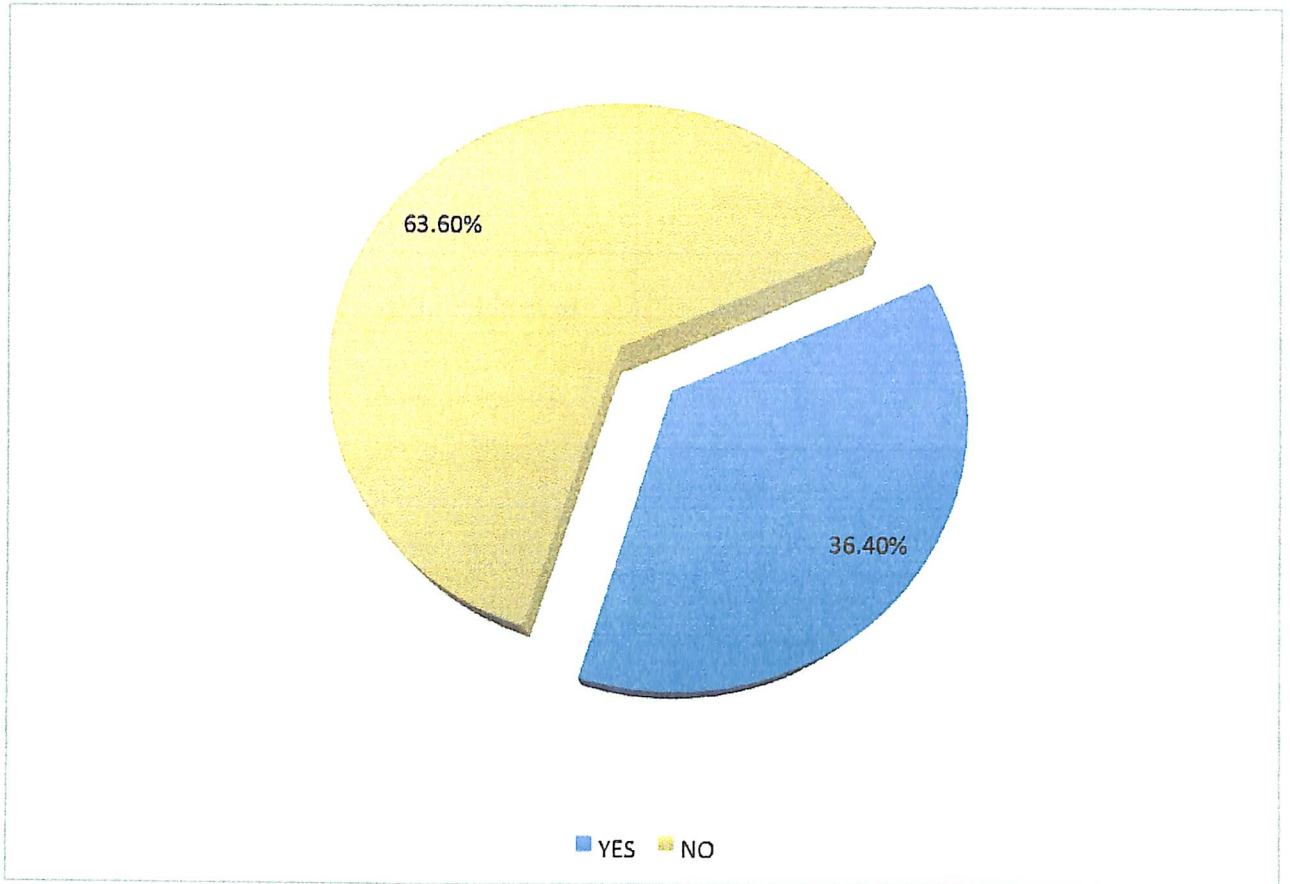


Figure No: 4.1.11 Showing Morale Influence of The Respondent

Table No 4.1.21 Showing Respondents Satisfaction About Job Security

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	63	25.2
2	Satisfied	55	22
3	Neutral	47	18.8
4	Dissatisfied	50	20
5	Highly Dissatisfied	35	14
Total		250	100

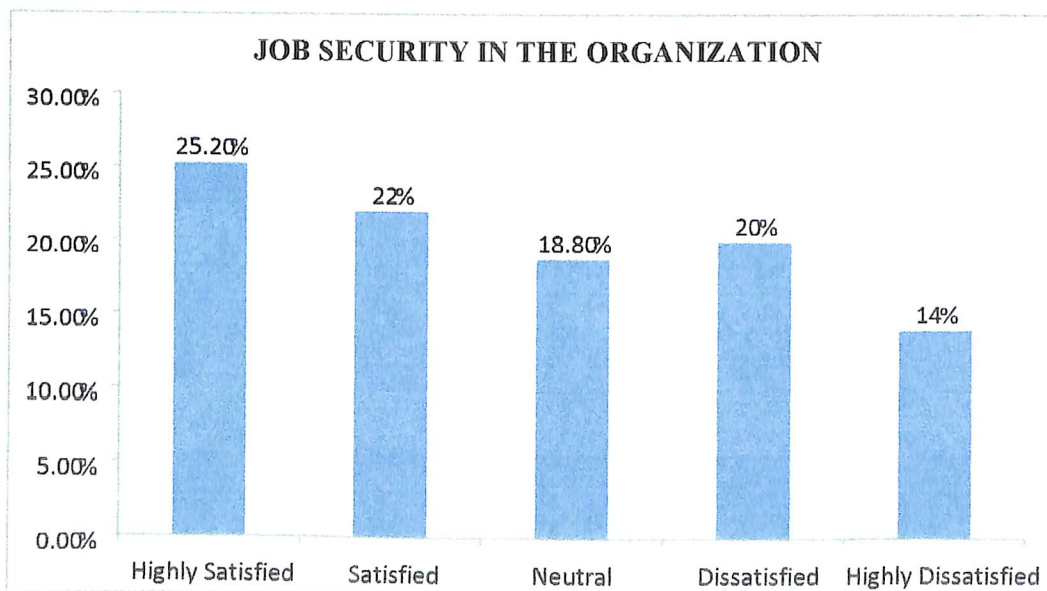


Figure No: 4.1.12 Showing Job Security of The Respondent

Table No 4.1.22 Showing Respondents Satisfaction of Employee Self-improvement

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	102	40.8
2	Satisfied	57	22.8
3	Neutral	77	30.8
4	Dissatisfied	10	4
5	Highly Dissatisfied	4	1.6
Total		250	100

Table No 4.1.23 Showing Respondents Satisfaction of Working Environment

S. No	Opinion	No. of the Respondents	Percentage (%)
1	Highly Satisfied	62	24.8
2	Satisfied	72	28.8
3	Neutral	45	18
4	Dissatisfied	54	21.6
5	Highly Dissatisfied	17	6.8
Total		250	100

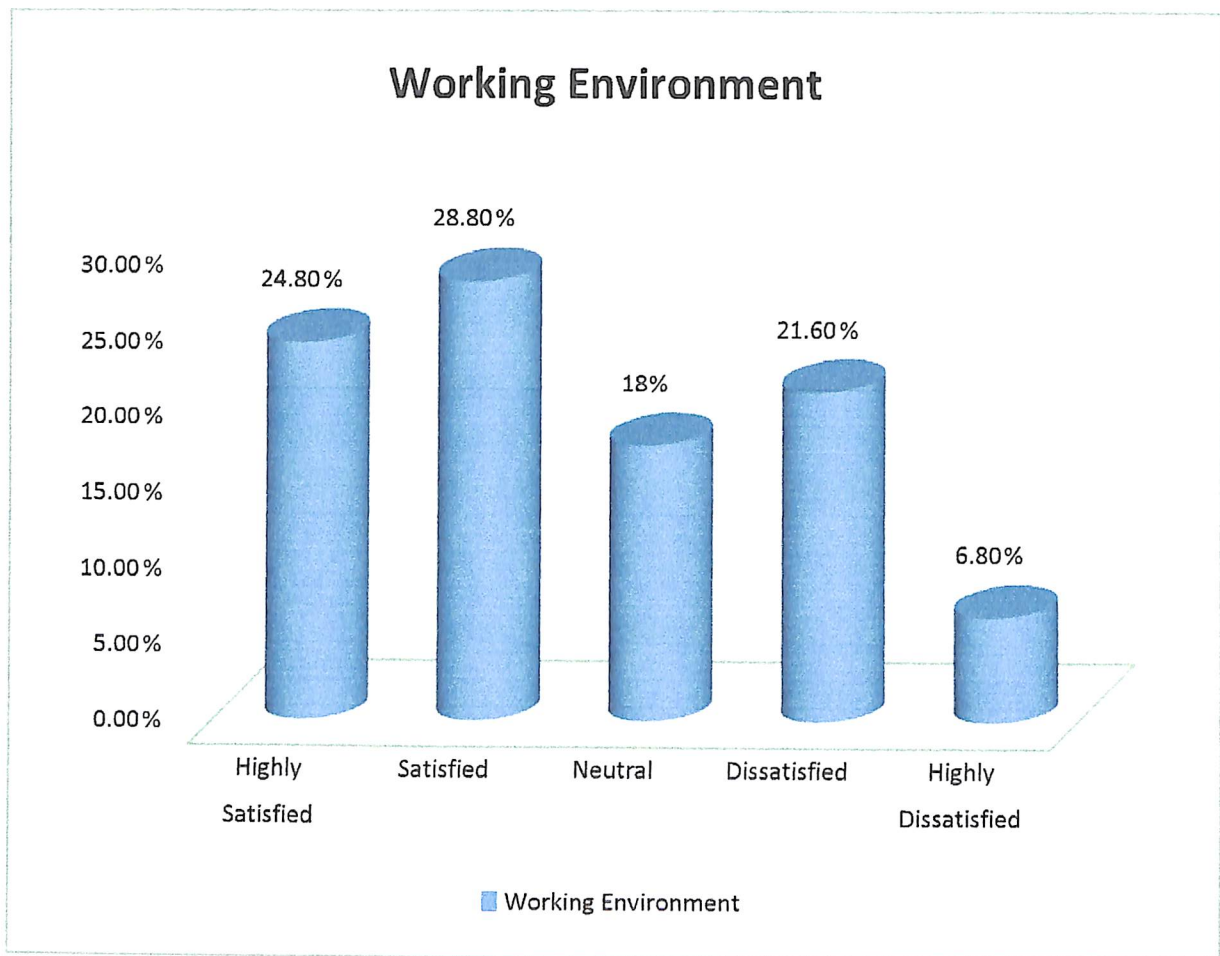


Figure No: 4.1.13 Showing Working Environment of The Respondent

4.2 Correlational Research

It is not always possible to conduct a real experiment for both practical and ethical reasons. For example, it may not be possible to design an experiment in which the amount of social support employees receive from the leader is manipulated. This approach will be viewed as unethical by most people, but studying natural variation in this phenomenon is possible. Research in which working conditions are studied will often include a correlational design. The purpose may be to map out various work demands such as workload and burnout.

After these variables have been studied, various statistical techniques may be used to study the relationship between these variables. Also, more complex models of how multiple variables are connected with burnout can be studied, in addition to examining the extent to which burnout can be predicted from work-related factors and personal characteristics.

CHI-SQUARE TEST

Relationship between salary and shift hours of employees.

Null Hypothesis:

There is no relationship between salary and shift hours of employee.

Alternative Hypothesis:

There is relationship between salary and shift hours of employee.

Degrees of freedom (DOF) = $(r-1)(c-1) = (5-1)(5-1) = 16$

Level of significant = 0.05

Table value = 26.30

Calculated value = 29.06

Table No: 4.2.1 Showing Relationship Between Salary and Shift Hours of Employees.

Salary Shift hours	Less Than 5000	5001-8000	8001-1000	10001-12000	Above 12000	Total
	H S					
O_i	15	20	10	12	08	65
E_i	16.38	14.3	12.22	13	9.1	-
$(O_i-E_i)^2/E_i$	0.1163	2.2720	0.4033	0.08	0.133	-
S						
O_i	08	09	10	06	10	43
E_i	10.836	9.46	8.084	8.6	6.02	-
$(O_i-E_i)/E_i$	0.742	0.022	0.45	0.786	2.4	-
Neutral						
O_i	12	08	07	12	10	49
E_i	12.348	10.78	9.212	9.8	6.86	-
$(O_i-E_i)/E_i$	0.0098	0.7171	0.532	0.5	1.43	-
D S						
O_i	13	11	14	18	07	63
E_i	15.876	13.86	11.844	12.6	8.82	-
$(O_i-E_i)/E_i$	0.521	0.5901	0.4	2.314	0.4	-
H D S						
O_i	15	07	06	02	0	30
E_i	7.56	6.66	5.64	6	4.2	-
$(O_i-E_i)/E_i$	7.322	0.0242	0.023	2.67	4.2	-
Total	63	55	47	50	35	250

Relationship Between Satisfaction Level of Prohibition to Women Workers and Welfare of Women Workers.

Null Hypothesis:

There is no relationship between satisfaction level of prohibition to women workers and welfare of women workers.

Alternative Hypothesis:

There is relationship between satisfaction level of prohibition to women workers and welfare of women workers.

Degrees of freedom (DOF) = $(r-1) (c-1) = (5-1) (4-1) = 12$

Level of significant = 0.05

Table value = 21.026

Calculated value = 62.03

Table no: 4.2.2 Showing Relationship Between Satisfaction Level of Prohibition to Women Workers and Welfare of Women Workers.

Prohibition to women workers Welfare to women workers	HS	S	Neutral	DS	HDS	Total
HS O_i E_i	27	—	23	19	08	77
$(O_i - E_i)^2 / E_i$	19.712	15.4	16.94	16.4	8.008	-
	2.7	15.4	2.19	0.251	0.000008	-
S O_i E_i	13	16	10	12	03	54
$(O_i - E_i) / E_i$	13.82	10.8	11.88	11.88	5.616	-
	1.056	2.506	0.3	0.0012	1.22	-
Neutral O_i E_i	12	14	16	18	09	69
$(O_i - E_i) / E_i$	17.664	13.8	15.18	15.18	7.176	-
	1.82	0.000289	0.05	0.53	0.5	-

D S	O_i	10	07	03	05	04	29
	E_i						
	(O_i-E_i) /E_i	7.424	5.8	6.38	6.38	3.016	-
HD S	O_i	02	14	03	—	02	
	E_i						
	(O_i-E_i) /E_i	5.376	4.2	4.62	4.62	2.184	
		2.121	22.87	0.57	4.62	0.015	
Total		64	50	55	55	26	250

ANOVA

Table No: 4.2.3 Satisfaction Level of Job Security

Particular	Sum of squares	Difference	Mean Square	F	Sig.
Between Groups	459.361	4	114.840	1.236E3	.000
Within Groups	22.755	245	.093		
Total	482.116	249			

Table No: 4.2.4 Satisfaction Level of Working Environment

Particular	Sum of Squares	Difference	Mean Square	F	Sig.
Between Groups	459.361	4	114.840	1.236E3	.000
Within Groups	22.755	245	.093		
Total	482.116	249			

CHAPTER V

INTERPRETATION OF RESULTS

5.1 Interpretation

The age table shows that 9.6% of the respondents are belonging to the below 20 years, 14.8% of the respondents are belonging to the 21-25years, 31.4% of the respondents are belonging to 26-30years, 18.4% of the respondents are belonging to 31-35years, 14.4% of the respondents are belonging to 36-40years, 11.2% of the respondents are belonging to 40 and above.

The educational qualification table shows that 32% of the respondents qualified upto 10th, 25.6% of the respondents are belonging qualified up to +2, 2.8% of the respondents are qualified ITI, 4.8% of the respondents are qualified to diploma, 27.6% of the respondents are qualified to UG, 7.2% of the respondents are PG.

The designation table shows that 42.8% of the respondents are Unskilled Worker, 33.6% of the respondents are skilled Worker, 11.6% of the respondents are Supervisor, 12% of the respondents are Executive.

The sex of employees table shows that 40.8% of the respondents belonging to Male, 59.2% of the respondents are belonging Female.

The marital status of workers table shows that 54.2% of the respondents are single, 45.2% of the respondents are married.

The experience indicate table shows that 51.6% of the respondents having less than one-year experience, 22% of the respondents are having 1-3 years' experience, 15.2% of the respondents are having 3-7 years' experience, and 8.4% of the respondents are having 7-10 years' experience. 2.8% of the respondents are having above 10 years' experience.

The salary by the organisation table shows that 26% of the respondents get less than 10000 salary, 17.2% of the respondents are get 10001-14000 salary, 20.6% of the respondents are get 14001-18000 salary, 25.2% of the respondents are get 18001-25000 salary. 11.2% of the respondents are get salary above 25000.

The prohibition provided to the women workers in working area table shows 30.8% of the respondents is highly satisfied. And 21.6% of the respondents are satisfied, and 11.6% of the respondents are dissatisfied, and 27.6% of the respondents are pinioned neutral. 8.4% of the respondents are highly dissatisfied with Prohibition provided to the women workers in working area.

The precaution against dangerous fumes table shows that, 42% of the respondents are highly satisfied.31.6% of the respondent's satisfied, and 12.8% of the respondent's dissatisfied, and 9.6% of the respondent's opinion natural, 4% of the respondents highly dissatisfied with Prohibition precaution against dangerous fumes.

The precaution against the use of portable electronic lights table shows that 42% of the respondents are highly satisfied. 31.6% of the respondents are satisfied and 9.6% of the respondent's opinion neutral. And 12.8% of the respondent's dissatisfied, 4% of the respondents are highly dissatisfied precaution against the use of portable electronic lights.

The emergency exit of working area table shows that 30% of the respondent's highly satisfied with Emergency exit provided in the Organization.45.6% of the respondent's satisfied with provided Emergency exit in the Organization, and 16.8% of the respondents' opinion neutral Emergency exit provided in the Organization .6% of the respondent's dissatisfied with Emergency exit provided in the Organization, 2% of the respondents get highly dissatisfied with Emergency exit provide in the Organization.

The safety measures by the organisation table shows that 30% of the respondent's highly satisfied with safety measures provided in case of fire.36% of the respondent's satisfied with safety measures provided in case of fire, and 24.8% of the respondents felt with safety measures provided in case of fire. And 0.8% of the respondent's dissatisfied with safety measures provided in case of fire, 8.4% of the respondents get highly dissatisfied with safety measures provided in case of fire.

The first aid facilities by the organisation table shows that 28.8% of the respondent's highly satisfied with first aid appliance.58% of the respondent's satisfied with first aid appliance and 7.6% of the respondent's neutral opinion with first aid appliance. And 4% of the respondent's dissatisfied with first aid appliance, 1.6% of the respondents get highly dissatisfied with first aid appliance provide by the organization.

The shift hours of employees table show that 25.6% of the respondent's highly satisfied with organization shift hours.20% of the respondent's satisfied with Shift Hours, and 22% of the respondents felt neutral about shift hours. And 22% of the respondent's dissatisfied with shift hours, 10.4% of the respondents get highly dissatisfied with shift hours provide by organization.

The leave table shows that 38.8% of the respondent's highly satisfied with organization Leave facilities.37.2% of the respondent's satisfied with Leave facilities, and 14.8% of the respondent's neutral opinion with Leave facilities. And 3.2% of the respondent's dissatisfied with Leave facilities, 6% of the respondents get highly dissatisfied with Leave facilities provide by the Organization.

The welfare facilities to the women workers table shows that 25.6% of the respondent's highly satisfied with Welfare facilities provided to women employees.20% of the respondent's satisfied. 22% of the respondents neutral. And 22% of the respondent's dissatisfied, 6% of the respondents get highly dissatisfied with Welfare facilities provided to women employees.

The Counselling provided by the mentor table shows that 15.6% of the respondent's highly satisfied with Counseling provided by mentor.20.8% of the respondent's satisfied with Counseling provided by mentor. And 7.6% of the respondents pinioned neutral with Counseling provide by mentor. 29.2% of the respondent's dissatisfied with Counseling provided by mentor, 26.8% of the respondents get highly dissatisfied with Counseling provided by mentor.

The career growth for the employee in organization table shows that 29.2% of the respondent's highly satisfied.35.2% of the respondent's satisfied. And 18.4% of the respondent's opinion neutral. And 11.6% of the respondent's dissatisfied, 5.6% of the respondents get highly dissatisfied with career Growth for the employee in the organization.

The Grievance Settlement System table shows that 24.8% of the respondents are highly satisfied with Grievance Settlement System, 38% of the respondent's satisfied with Grievance Settlement System.18.4% of the respondents neutral with Grievance Settlement System.12% of the respondent's dissatisfied with Grievance Settlement System,6.8% of the respondents get highly dissatisfied with Grievance Settlement System.

The Morale Influence on Production table shows that 36.4% of the respondents are say yes with the morale influence on production, 63.6% of the respondents are say no with the morale influence on production.

The job security in the organization table shows that 25.2% of the respondents are highly satisfied with Job Security provided by the Organization.22% of the respondent's satisfied with Job Security, and 18.8% of the respondents' opinion neutral with Job Security. And 20% of the respondent's dissatisfied with Job Security, 14% of the respondents get highly dissatisfied with Job Security provided by the Organization.

The satisfaction of employee self-improvement table shows that 40.8% of the respondents are highly satisfied with Employee self-improvements in the organization.22.8% of the respondent's satisfied. And 30.8% of the respondents neutral. 4% of the respondent's dissatisfied,1.6% of the respondents with highly dissatisfied with Employee self-improvement in the organization.

The working environment table shows that 24.8% of the respondents are highly satisfied with Working Environment.28.8% of the respondents are satisfied with Working Environment in the organization. And 18% of the respondent's opinion neutral with Working Environment in the organization. And 21.6% of the respondents are dissatisfied with Working Environment in the organization,6.8% of the respondents get highly are dissatisfied with Working Environment in the organization system.

The relationship between salary and shift hours of employees table shows calculated value is greater than table value. So, there is significant relationship between salary and shift hours of employees.

There is no relationship between satisfaction level of prohibition to women workers and welfare of women workers.

The satisfaction level of job security table shows calculated value is greater than table value. So, there is significant relationship between satisfaction level of prohibition to women workers and welfare of women workers.

5.2 Comparison of Results

- 31.6% of respondents are under the age group of 26-30.
- 27.6% of respondents are qualified with UG level.
- 42.8% of respondents is unskilled workers.
- 59.2% of respondents are Female.
- 54.2% of respondents are not married.
- 51.6% of respondents are having less than one-year experience.
- 25.2% of respondents are get 18001-25000 Salary
- 30.8% of respondents are highly satisfied with the Prohibition to the women worker
- 31.6% of respondents are satisfied with Precaution Against Dangerous Fumes
- 35.2% of respondents are satisfied with Precaution Against portable electronic light
- 45.2% of respondents are satisfied with Emergency exit provided in the Organization
- 36% of respondents are satisfied with Safety Measures Provide in Case of Fire
- 58% of respondents are satisfied with first Aid Appliance
- 25.2% of respondents are highly satisfied with Shift Hours Provide by Air India SATS Airport Services
- 38.8% of respondents are highly satisfied with Leave facilities provided by the Organization
- 25,6% of respondents are highly satisfied with Welfare facilities to women employees
- 29.2% of respondents are dissatisfied with the Counseling provide by mentor
- 35.2% of respondents are satisfied with the Career Growth
- 38% of respondents are Efficient with Grievance Settlement System
- 63.6% of respondents are felt Morale influence on production
- 25.2% of respondents are highly satisfied with Job Security in the Organization
- 40.8% of respondents are highly satisfied with Employee self-improvement
- 28.8% of respondents are satisfied with Working Environment of the Organization.

CHAPTER – VI

CONCLUSION AND SCOPE FOR FUTURE WORK

Conclusion

The study on employee safety and human factor measures level revealed that workers are satisfied on major of the factors. From the findings and analysis that safety and welfare measures strongly influence the productive efficiency of the organization and increase effectiveness participation on training programs.

Organization can show good performance in safety and welfare measures. It is important for them to carry out their operations effectively. From this research researcher conclude that most of the employees of “Air India SATS Airport Services Pvt Ltd” are satisfied with the safety and welfare facilities provided by the organization with exception of a few facilities. From the finding the research conclude that the safety and welfare facilities are provided properly, in addition to that Air India SATS Airport Services Pvt Ltd is one of the best organizations in providing safety and psychological welfare facilities to employees.

Scope for Future Work

This study would give an over view of the safety and welfare measure existing at **Air India SATS Airport Services Pvt Ltd**. Since safety and welfare are two important elements essential for improving the productivity of an organization, a study on the existing welfare measure would help the organization perform better. This study would throw light on the perception of the employees regarding safety and welfare in **Air India SATS Airport Services Pvt Ltd** and can identify the areas where it can improve so as to improve the performance of the employees. This study would also help to analyse if there is dependence between workers safety, human errors and their motivation in work.

BIBLIOGRAPHY

Monica Martinussen & David R. Hunter, *Aviation Psychology and Human Factors*, CRC press, Taylor and Francis group, Boca Raton, Sep 2009

Hawkins, F. H. *Human factors in flight*. Aldershot, England: Ashgate Publishing Ltd. 1993.

Edwards, E Introductory overview. In *Human factors in aviation*, ed. E. L. Weiner and D. C. Nagel, San Diego: Academic Press, 1988 (3–25).

Jensen, R. S. The boundaries of aviation psychology, human factors, aeronautical decision making, situation awareness, and crew resource management. *International Journal of Aviation Psychology*, 1997 (7:259–267)

REFERENCES

1. A. Schwaninger, D. Hardmeier, and F. Hofer, "Measuring visual abilities and visual knowledge of aviation security screeners," in Proceedings of the Proceedings - IEEE 38th Annual 2004 International Carnahan Conference on Security Technology, pp. 258–264, USA, October 2004.
2. M.-C. Hsieh, M.-C. Chiu, and S.-L. Hwang, "An optimal range of information quantity on computer-based procedure interface design in the advanced main control room," Journal of Nuclear Science and Technology, vol. 52, no. 5, pp. 687–694, 2015
3. Y. Wiseman and Y. Giat, Multimodal Security in Passenger and Freight Transportation: Frameworks and Policy Applications, D. Rhoades, G. Reniers, and J. Szyliowicz, Eds., Edward Elgar Publishing, 2016.
4. M. S. F. Arc, E. S. Nakamura, R. R. D. Pereira, T. Armbrorst, and J. Fortes, "Security screening process of passengers in Brazilian airports: Bivariate analysis of human errors and factors," Journal of Airport Management, vol. 11, no. 3, pp. 271–293, 2017.
5. J. Reason, El Error Humano, Modus Laborandi, Madrid, Spain, 2009.
6. M. B. Salter, "Seems and sensibility: Security management systems and the management of risk in the Canadian Air Transport Security Authority," Journal of Air Transport Management, vol. 13, no. 6, pp. 389–398, 2007.
7. G.-F. Liang, J.-T. Lin, S.-L. Hwang, E. M.-Y. Wang, and P. Patterson, "Preventing human errors in aviation maintenance using an on-line maintenance assistance platform," International Journal of Industrial Ergonomics, vol. 40, no. 3, pp. 356–367, 2010.
8. J. Reason, Human Error, Cambridge, United Kingdom, Cambridge University Press, United Kingdom, 1990.

Websites

- www.google.com
- www.youtube.com
- www.wikipedia.com

APPENDIX: INTERVIEWER SCRIPT

Hello Sir/Madam I am a University Student and I am conducting a survey about human factors in aviation Safety. Can I ask some questions related to that?

1. What is your name?
2. What is your age?
3. What is your highest educational qualification?
4. What is your designation in this company?
5. What is your opinion about aviation industry?
6. Are you married or single?
7. How long you been working in the Organization?
8. What is your present salary?
9. Are you satisfied with the prohibition provide to the women worker's in working area?
10. Are you satisfied with the precaution against dangerous fumes?
11. Are you agree with proper precautions against the use of portable electric light in Working area?
12. Are you satisfied with the emergency exit provide in the organization Building?
13. Are you satisfied with the safety measures provide by the Organization in case of fire?
14. Are you satisfied with the first aid appliance provide by the Organization?
15. Are you satisfied with the shift hours provide by the Air India SATS?

16. Are you satisfied with the leave facilities provide by the Organization?
17. Are you satisfied with the welfare facilities provide to the women employee?
18. Are you satisfied with the counselling provide by the mentor?
19. Are you satisfied with the organization support for your career growth?
20. Specify your option about grievance settlement system in Air India SATS?
21. Do you feel your morale is directly influence on production?
22. Are you satisfied with organization job security?
23. Does the organization support towards employee self-improvement?
24. Are you satisfied with the working environment of Air India SATS?
25. If you suggest any other Safety & welfare measures, enumerate please
 - 1)
 - 2)