

**A STUDY ON CHALLENGES FACED BY E.B
TECHNICIANS IN EMERGENCY SITUATIONS
[LIKE FLOODS]**

Submitted in partial fulfillment of the requirements for the award of

Bachelors of Business Administration

BY

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SCHOOL OF BUSINESS ADMINISTRATION

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC | 12B Status by UGC
| Approved by AICTE**

Jeppiaar Nagar, RAJIV GANDHI SALAI, CHENNAI - 600119

April – 2021



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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the **BONAFIDE** work
GOPIKA KRISHNA.G (REG NO: 38280036) who have done the Project work entitled
**"A STUDY ON CHALLENGES FACED BY E.B TECHNICIANS IN EMERGENCY
SITUATIONS [LIKE FLOODS]"** under my supervision from **January 2021** to **March
2021**.

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Internal Examiner

External Examiner

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GANDAVARAM GOPIKA KRISHNA

DECLARATION

I **GOPIKA KRISHNA.G (REG NO: 38280036)** hereby declare that the Project Report entitled **“A STUDY ON CHALLENGES FACED BY E.B TECHNICIANS IN EMERGENCY SITUATIONS”** done by me under the guidance of **“DR. P KUMARASAMY** is submitted in partial fulfillment of the requirements for the award of **Bachelor of Business Administration** (degree) .

DATE: 17-03-2021

PLACE: CHENNAI

G.GOPIKA KRISHNA

ABSTRACT

Financial pressures on management and time pressures put on crews create conditions where individuals in the electric power industry resort to taking short-cuts, which can inevitably lead to serious worker injuries and fatalities. There are significant social and interpersonal challenges: poor supervision by individuals vested with the responsibility to maintain safe operations; field employees have poor attitudes towards management; and clueless management with no idea what's going on in the field because they never go out and enforce the organizational expectations for its employees. There is insufficient quality involvement in and an emphasis on job briefings and tailgate meetings by general foremen, foremen, and supervisors.

A poor safety culture that strives on blame and finger-pointing where management seems fully aware but not inclined to repair. Implementing change, even if poor performance is known, is difficult to accomplish. Workers disregarding safe work procedures must know and understand that the price includes their becoming injured permanently, killed, or dismissed from the company. Management issues such as the organizational culture, leadership matters, inadequate controls, and sub-optimal allocation of resources.

The electric power industry is very complex, dangerous, and challenging. The number of workplace accidents declined over the last decade, but worker injuries and fatalities continue to occur. Participants concurred that organizational leadership, managers, supervisors, and workers were in different ways responsible for accident prevention. Supervisors and managers who communicated organizational priorities, and demanded strict compliance with policies, rules, and procedures, promote social change in a highly specialized industry.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In the present time Electrical work is really an important aspect of civil work .Electricity is a form of energy. It's a basic need for every one day to day life. Some employees such as engineers, electricians, electronic technicians, and power line workers, among others work with electricity directly. Others, such as office workers and sales personnel etc. work with it indirectly. Perhaps because it has become such a familiar part of the day to day life, many persons pay less attention to how much this work depends on a reliable source of electricity. In services, it is the customer who defines the quality and human side of service is key to deliver quality. The measures of service quality obtained through consumer surveys have become a widely used business performance measurement tool. This is because service quality is related to costs, profitability.

Electricians install maintain & repair electrical power, communication, lightning and control system in homes, business and factories. Almost all electricians work full time and weekends over duty is common for all and work pressure will be more in this field.

Electricians are divided into two primary categories: linemen, who work on electric utility company distribution systems at higher voltages, and wiremen, who work with the lower voltages utilized inside buildings. Wiremen are generally trained in one of five primary specialties: commercial, residential, light industrial, industrial, and low-voltage wiring, more commonly known as Voice-Data-Video, or VDV. Other sub-specialties such as control wiring and fire-alarm may be performed by specialists trained in the devices being installed inside wireman.

Electricians installing, wiring in exciting buildings. They will repair and they will check on large projects. Electricians are focusing on hanging and operating stage lightning. They need to be trained for work. Training of electricians are typical program consist of 80-90% work on hands like practical under the supervision and 10-20% class room training. They also need to attend schools for provincial exam. This training enables them to have 9000 hours of practical work. This credentials gives the ability to become a licensed Electrician.

1.2 INDUSTRY PROFILE

The Industry covers the generation, transmission, distribution and sale of electric power to the general public and industry. The commercial distribution of electric power started in 1882 when electricity was produced for electric lighting. In the 1880s and 1890s, growing economic and safety concerns lead to the regulation of the industry. What was once an expensive novelty limited to the most densely populated areas, reliable and economical electric power has become an essential aspect for normal operation of all elements of developed economy.

By the middle of the 20th century, electricity was seen as a "natural monopoly", only efficient if a restricted number of organizations participated in the market; in some areas, vertically-integrated companies provide all stages from generation to retail, and only governmental supervision regulated the rate of return and cost structure.

Since the 1990s, many regions have broken up the generation and distribution of electric power. While such markets can be abusively manipulated with consequent adverse price and reliability impact to consumers, generally competitive production of electrical energy leads to worthwhile improvements in efficiency. However, transmission and distribution are harder problems since returns on investment are not as easy to find.

India is the 3rd largest producer and 2nd largest consumer of electricity in the world and had an installed power capacity of 373.43 GW. Power electronics is the application of solid-state electronics to the control and conversion of electric power.

Power electronics started with the development of the mercury arc rectifier in 1902, used to convert AC into DC.

1.2.1: RESPONSIBILITIES AND DUTIES

- Repair and replace defective components in motors, generators, controllers, storage batteries, switchboards, conductors, switches and varied electrical fixtures.
- Install, maintain and repair electrical, electromechanical and electronic parts of machinery and equipment.
- Perform defensive repair and preservation of field, plant and shop for electronic and electrical systems, equipment and devices.
- Test solid-state circuitry to determine defective components in analog and digital equipment along with defective parts replacement.
- Install improvements and major upgrades to electrical plant and subsystems.
- Conduct infrared analysis and field equipment examination using specialized thermo graphic imaging and digital cameras.
- Design and modify motor power control apparatus circuits.
- Read and interpret blueprints, schematics and wiring diagrams.
- Prepare schedules and coordinate activities with varied electrical divisions and sections.
- Plan and prepare work orders or instructions utilizing blueprints, sketches and drawings.
- Ensure accurate and apt completion of all protective maintenance duties.
- Fabricate and test all electrical harnesses for space flight or non-flight applications and EGSE.
- Ensure to populate printed circuit boards.
- Integrate and test EGSE and space flight or non-flight applications for electronic board assemblies.
- Evaluate electrical as well as operational problems.

1.2.2: INJURIES AND ILLNESS

Working with electricity is dangerous. Electricians must take precautions to avoid getting hurt. Although accidents are potentially fatal, common injuries include electrical shocks, falls, burns, and other minor injuries.

To reduce these risks, workers must wear protective clothing and safety glasses. Electricians who are subject to loud noises, such as those in factories, must wear hearing protection.

1.2.3: Work Schedules

Almost all electricians work full time. Work schedules may include evenings and weekends. Overtime is common.

Self-employed electricians often work in residential construction and may be able to set their own schedule.

1.2.4: Education and Training

Most electricians learn through an apprenticeship, but some start out by attending a technical school. Most states require electricians to be licensed. For more information, contact your local or state electrical licensing board.

A high school diploma or equivalent is required to become an electrician. Some electricians start out by attending a technical school. Many technical schools offer programs related to circuitry, safety practices, and basic electrical information. Graduates of these programs usually receive credit toward their apprenticeship.

1.2.5: Training

Most electricians learn their trade in a 4- or 5-year apprenticeship program. For each year of the program, apprentices typically receive 2,000 hours of paid on-the-job

Workers who gained electrical experience in the military or in the construction industry may qualify for a shortened apprenticeship based on their experience and testing.

Technical instruction for apprentices includes electrical theory, blueprint reading, mathematics, electrical code requirements, and safety and first-aid practices. They may also receive specialized training related to soldering, communications, fire alarm systems, and elevators.

Several groups, including unions and contractor associations, sponsor apprenticeship programs. Apprenticeship requirements vary by state and locality.

1.2.6: History

The Discovery of Electricity by Benjamin Franklin

In 1752, Benjamin Franklin ran his famous kite experiment that sparked the discovery of electricity. As a prominent American scientist and one of America's founding fathers, Franklin tied a key to a kite string during a thunderstorm and proved that static electricity and lightning were one and the same thing. Following this historic result, people were eager to try to harness the power of electricity for the primary goal of lighting their homes in a cheap and safe way instead of oil and gas lamps which were flammable and dangerous.

The World's First Current & Electric Motor by Faraday

Fast forward to 1831, Michael Faraday realized that an electric current could be produced by passing a magnet through a copper wire. This amazing discovery formed the bedrock of today's electricity and how we generate it, through magnets and coils of copper wires in big power plants. Because of this principle, both the electric motor (where electricity is converted into motion) and the generator (where motion is converted into electricity) were born.

1.3: BASIS OF ELECTRICITY

Electricity flows more easily through some materials than others. Some substances such as metals generally offer very little resistance to the flow of electric current and are called conductors. A common but perhaps overlooked conductor is the surface or subsurface of the earth. Glass, plastic, porcelain, clay, pottery, dry wood, and similar substances generally slow or stop the flow of electricity. They are called insulators. Even air, normally an insulator, can become a conductor, as occurs during an arc or lightning stroke.

1.3.2: ELECTRICAL HAZARDS

Electricity has long been recognized as a serious workplace hazard, exposing employees to electric shock, electrocution, burns, fires, and explosions. In 2009, for example, 278 workers died from electrocutions at work, accounting for almost 5% of all on-the-job fatalities that year, according to the Bureau of Labor Statistics. What makes these statistics more tragic is that most of these fatalities could have been easily avoided.

1.3.3: CATEGORIES OF ELECTRICAL HAZARDS

Basically, electrical hazards can be categorized into three types:

- i. Electrical shock.
- ii. Electrical burns
- iii. Effects of blasts which include pressure impact, flying particles from vaporized conductors and first breath considerations.

1.3.4: ELECTRIC SHOCKS

Electricity travels in closed circuits, normally through a conductor. But sometimes a person's body. Human body can mistakenly become part of the electric circuit. This can cause an electrical shock. When a person receives a shock, electricity flows between parts of the body or through the body to a ground or earth.

1.3.5: Overview of the Electricity Industry Workforce

The electricity system depends on a workforce that fills a diverse set of jobs—from the coal miner extracting fuel from the ground for electricity generation, to the utility worker repairing a distribution line, and everything in between. The following section provides an overview of the number and types of jobs related to the electricity industry with wealth and good fortune.

1.3.6: Electricity Utility Worker Health and Safety

The electricity industry has made progress in improving workplace safety. From 1995 to 2013, the number of injured per 100 employee-years in electricity utilities decreased from 4.7 to 1.3.⁴⁷ In 2015, the workplace injury rate across electricity generation, transmission, and distribution companies was slightly more than half the national rate.⁴⁸ However line workers continue to experience hazardous working conditions. In 2014, electrical power line installers and repairers suffered 25 fatal work injuries a rate of 19 per 100,000 full-time equivalent workers, which is over five times the national fatal work injury rate. For electricity utility workers, the injury rate is highest among the 21–30-year-old age group at 3.7 percent. This segment only makes up 10.7 percent of the sector workforce, but has higher rates of injury due to “fewer years of experience and a higher proportion of young workers employed in higher risk occupations, performing physically demanding or higher risk tasks.”

1.4: NEED FOR THE STUDY

Research methodology is mainly needed for the purpose of framing the research process and the designs and tools that are to be used for the project purpose. Research methodology helps to find the problems faced by electricians during floods. This time research methodology is framed for the purpose of finding the level of challenges and safety measures taken by them.

1.5: SCOPE OF THE STUDY

- Everyone should know about the challenges faced by EB technicians in their daily routine.
- To gain basic knowledge about working environment.
- Training employees to work safely around electrical hazards is a critical requirement for maintaining worker.
- Electricity is a serious work place hazard that can result in serious injuries, if they are not properly trained.
- Electricity is a basic need, so that safety is must.
- In this job ,

A safe and healthy workplace not only protects workers from injury and illness, it can also lower injury/illness costs, reduce absenteeism and turnover, increase productivity, quality and raise employee morale.

1.6: OBJECTIVE OF THE STUDY

This project is designed mainly to identify challenges and safety measures taken while working by electricians.

1.6.1: PRIMARY OBJECTIVES

To identify problems faced by electrical technicians during emergency situations.

- Electrical technicians should learn responsibilities and duties during their training period.
- E.B technicians must have full knowledge of the electric field and good at problem solving in a field instantly.
- Safety precautions taken in the work field like wearing PPE, helmets, rubber gloves etc.

1.6.2: SECONDARY OBJECTIVES

- To identify technical and other impediments in the efficient and economic operation of power.
- A talented technical professional with strong knowledge of digital sub -system and ability to lead complex technical projects.
- Effective problem solving skills as well as flexible to work in any shift.
- Hard working and punctual with ability to control the team.
- To assist in augmenting internal and external resources for the development of the electricity supply industry.
- Effective communication skills, with the clients as well as the customers in case of direct dealing.

1.7: LIMITATIONS OF THE STUDY

- The analysis of the present study has been carried out based on the information collected from the Electrical Technicians in emergency situations.
- The study is an opinion survey; caution may have to be exercised while extending the result to other areas.
- Due to time constrict only 160 numbers of respondents were considered.
- The result fully depends on the information given by the respondents which may be based.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

In this Chapter, the researcher has made an attempt to study and understand the complex concepts of electricians work. This attempt includes, understanding the basic concepts of safety measures and known about the work done by electricians, analyzing research studies made by earlier researchers in respect handling customers. For this, the researcher has used various books, research and websites. The detailed list is further elaborated in the Bibliography. Through this Literature Survey researcher wants to find out which are the important parameters of challenges faced by electricians during emergency situations like floods.

2.2 List of reviews

MOORE (2018):- The study results proved useful in the electrical power industry only, because of the uniqueness that existed in this industry. The use of the 'BOLMAN' and Deal four-frame approach to analyzing data and participant feedback provided for an appreciation and real understanding of the issues that contributed to serious and fatal accidents in the electrical power industry may be advantageous. This advantage might be a limitation as it can prove challenging to extend the lessons beyond the realm where the participants were experts and to extend the findings to other industries and workplaces was not an expectation.

CLIBBENS, WALTER et.al. Baird, 2012; San SU & THORKILDSEN (2018):- The Delphi panelists as research participants could have brought very pointed views

prevalent only where the individual worked. Researcher tact and skill to ensure that the research remained on-course was essential because, in the end, the electrical power industry might become much safer.

JORMA KYYRA (2017):- The overview of electrical and safety tips revealed a level of awareness of electrical hazards and safety measures knowledge among electrical users. From the study, it has become cleared that many users of electricity are not well informed or aware about electricity hazards and safety measures.

B.KOTI REDDY (2016):- This study examines that the implications of these are seen in number of electricity accidents witnessed in homes and offices. To avoid this, everyone both at offices and at homes must help spread this awareness of electrical hazards and safety.

VOLBERG ET AL (2016):- The best candidates declined participation even though the selectees possessed & necessary experience and knowledge to satisfy the research requirements and criteria. This selection included experienced and knowledgeable electric power industry managers, supervisors, trainers, selected from the across the United States and who knew about serious and fatal accidents that occurred in the industry.

S.PADMA (2016):- Participants were able to describe work arrangements, procedures, environments, and issues that were pertinent and vitally connected to work place safety management in the electrical power industry. The participants were willing to share information that contributed to new learning and for an opportunity to understand what went wrong. The participant identification process on public social media provided more significant opportunities for suitable panelists as experienced and respected industry practitioners for this study. That way, each participant were interested as contributors to accident prevention efforts and to make the electric power industry safer.

ALON HARD CASTLE (2015):-In particular, suggest that there were a significant improvement in electricity workers knowledge and practices regarding prevention of electricity health hazards.

YIN (2014):-My personal and professional bias, as the researcher, which influenced the strategy used to conduct the literature search, data collection, and analysis in this study. The Delphi technique preference in this study allowed me to include one question in the Round 1 questionnaire to encourage the Delphi panelists to suggest other information they considered as pertinent for this study and which was not covered by the questions set by me. The identification of relevant issues represented a significant effort to improve the research trustworthiness as well as the data derived from the process.

PATTON (2013):-Inclusion to the Delphi panelists as research participants for confirmation of the information they provided enhanced the likelihood that the data was correct.

MARIA CARMEN MARTINEZ (2013):-Notes that the financial pressures on management and time pressure put on crews create conditions where individuals in the electric power industry resort to taking short-cuts, which can inevitably lead to serious worker injuries and fatalities. There are significant social and interpersonal challenges: poor supervision by individuals vested with the responsibility to maintain safe operations; field employees have poor attitudes towards management; and clueless management with no idea what's going on in the field because they never go out and enforce the organizational expectations for its employees and enforce the organizational expectations for its employees.

FRIDA M FISCHER (2012):-Analyzed that insufficient quality involvement in and an emphasis on job briefings and tailgate meetings by general foremen, and supervisors. A poor safety culture that strives on blame and finger-pointing where management seems fully aware but not inclined to repair. Implementing change, even if poor

performance is known, is difficult to accomplish.

DR NIKUNJA SWAIN (2012):-Workers disregarding safe work procedures must know and understand that the price includes their becoming injured permanently, killed, or dismissed from the company. Management issues such as the organizational culture, leadership matters, inadequate controls, and sub-optimal allocation of resources can lead to worker errors, especially when work procedures, policies, and standards are not well promulgated. Managers are responsible for ensuring appropriate communication of work procedures, policies, rules, and organizational priorities with employees.

ELIZABETH THOMPSON (2010):-Managers are also responsible for selecting employees with the right qualifications and for the actual placement of employees. It is, therefore, an indictment on management and supervision if workers lack necessary job experience knowledge, and were involved in workplace accidents, primarily when there was inadequate supervision of the work activities.

ANNEAR ET AL (2009):- The fifth involved my management of the Delphi study. The iterative process that the Delphi technique required was a possible disadvantage as research participants could have chosen to drop out before the end of the study. Attrition by participants may have affected the research and highlighted credibility issues in the overall findings.

WILLEMS SUTTON, & MAYBERY(2008):- Twenty-five participants was felt to be acceptable but only if the attrition rate remained less than 25 % over the entire study; to this end, the intention was to use more than 25 Delphi panelists as research participants.

OYEBODE, & OWENS (2007):- I remained meticulous and exercised all available opportunities to keep the research exercise free of administrative delays and inefficiencies.

MURRAY & PLUMMER (2006):- A sixth limitation involved a possible social desirability bias that could have resulted when Delphi panelists responded in ways that misrepresented their real position because they preferred to behave in ways considered as socially acceptable.

HEITNER ET AL (2005):-Removal of bias due to individual social desirability bias, the questions did not require Delphi panelists to reveal or recount their behavior, contribution, or influence on any particular accident or workplace issue directly related to the study. I also ensured that strictest controls on participant anonymity and research confidentiality.

SINCLIR (2004):- The first consideration of individuals at work should be the avoidance of accidents, the prevention of personal injuries, and the safeguarding of life. Workplace safety arrangements were regulated, and organizations included safety as among the highest values, sufficient for its inclusion in the mission, vision, and policy statements.

KIRCHMEYER (2003):- The research was another delimitation as this was deemed suitable by me as the researcher. This research provided opportunities for me to delimit the scope of the questions for Round 1 and for the themes and codes that I used as the researcher. The scales and measurement chosen worked well in previous research, and I anticipated a similar result in this study.

RICHA BURMAN (2002):-Basic knowledge, work pressure and understanding of work stress or industry are causing a number of work force challenges for the

electricity industry, which include large shifts in skills needed and in geographic location of jobs. At the same time, the industry is also creating a number of new workforce opportunities, information and communication technology etc.

GOUTAM DUTTA (2002):-Electricity is in demand-side management technique that is capable of stimulating demand response. There are several insight that can be developed with respect to peak load reduction, demand elasticity market segmentation, pricing policy, enabling technology and customer satisfaction and willingness to pay.

AFSHARI (2002); WESTER & BORDERS (2001):- The possible research limitations, assumptions, and delimitations were included in Chapter 1 together with a definition section for terms relevant to this study: This was in addition to a section on the purpose of this research and another on the significance of this effort.

FORDYCE ET. AL. (2001); SCHWARZ & DRUDI (2001):- The general problem was that there is an increasing problem of electric power industry related fatalities across the United States. The specific problem was that although management in the U.S. electric power industry has placed heavy emphasis on workplace safety, fatal and serious accidents continue to happen and there are no clear solutions to prevent these accidents.

ANDEL, HUTCHINGSON & SPECTOR (2000):- Workplace safety challenges range from physical hazards that are always difficult to recognize and to mitigate, interpersonal interactions that complicate hazard abatement, and organizational factors driven by technology aided business horizons and stakeholder demands.

OSBORN, (2008):- The electric power industry, in this regard, is no different from many other business realms. The reach and impact of the electric power utility might match and even surpass other critical sectors such as water, communication, and

energy. The general arrangements for managing in these industries are aligned in many ways, even if each sector has unique priorities. In these sectors, complex dynamics give rise to surprising results and organizational flexibility.

ANDEL ET AL., (2000):- Electricity was dangerous, but it was not the only danger that electric power workers faced. There were electrical, fall, and other hazards in the working environment. Individuals who worked in these conditions must maintain an awareness of hazards. These workers must understand the dangers and be competent at initiating actions to mitigate the associated risks. Individual and personal safety was only as effective as the protective measures employed to keep the workplace safe. Death or severe injury was a frequent reminder of breached workplace safety barriers.

VANMEER, (1999):- The safety rules covered situations where employees were to involve their supervisors if circumstances existed where the work instruction was not specific or not fully understood: consistent with the leadership view espoused.

TUCKER ET AL. (2016):- There was another fatal workplace accident in this company despite organizational prevention efforts. This study was significant as it represented a real opportunity to determine why electric power industry workers became injured or killed at work and what could be done to prevent future accidents.

CAMERON, (1999):- In one organization where a fatal accident occurred in which four employees died, the organization approved and set safety rules indicated that safety rules were mandatory and required full compliance at all times.

CHAPTER 3

RESEARCH METHODOLOGY

3.1: RESEARCH DESIGN

3.1.1 Descriptive Research Design

Descriptive research is a study designed to depict the participants in an accurate way. More simply put, descriptive research is all about describing people who take part in the study.

3.2: SAMPLING TECHNIQUE

3.2.1 Convenience sampling method

- A convenience sample is one of the main types of non-probability sampling methods.
- A convenience sample is made up of people who are easy to reach.

3.3: SOURCES OF DATA

Data collection is the term used to describe a process of preparing and collecting data.

3.3.1 Primary Data – Questionnaire given to 160 respondents

3.3.2 Secondary Data - Websites and online, Published reports & Review of literature from published articles.

3.4: STRUCTURE OF QUESTIONNAIRE

Questionnaire was divided into two sections. First part was designed to know the general information about technicians and the second part contained the respondent's opinions about their work.

3.5: SAMPLE SIZE

The size of the sample is 160. Sample collected directly from the respondents with the help of a questionnaire. The collected sample is in the method of convenience.

3.5.1: SAMPLING AREA

Data collected area: NELLORE.

3.6: PERIOD OF STUDY

The duration of study is from January 2021 to March 2021 which is a three months of study.

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

Table 4.1.1: Age of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	18 to 28	75	46
2	28 to 38	50	32
3	38 to 48	25	16
4	48 above	10	6
	TOTAL	160	100

Source: Primary data.

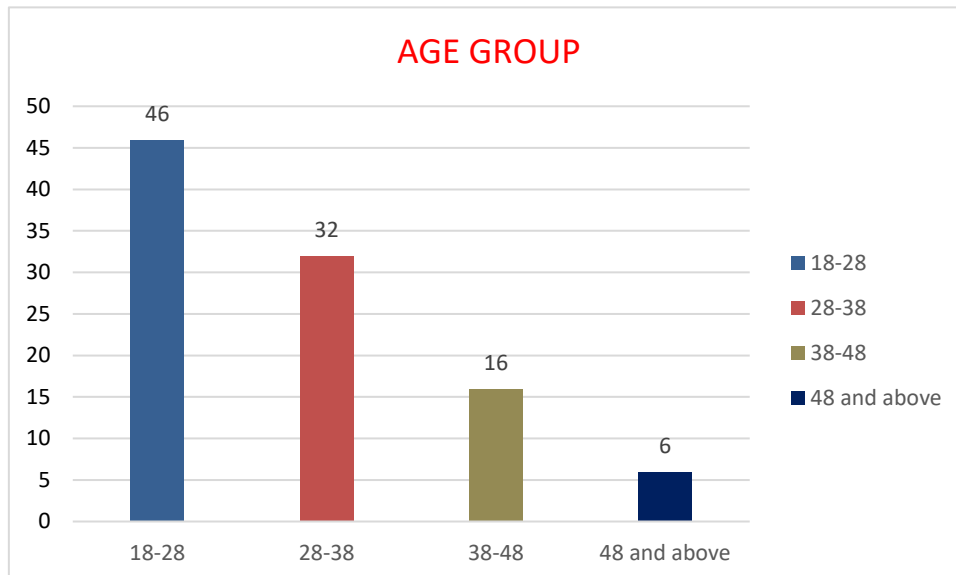


Chart 4.1.1: Age of the respondents

Interpretation

From the above table it is interpreted that the number of respondents between 18 to 28 respondents are 46%, between 28 to 38 age of the respondents are 32%, between 38 to 48 age of respondents are 16%, 48 above age of respondents are 6%.

Inference

Majority (46%) of the respondents are age between 38 to 48 years.

Table 4.1.2: Gender of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Male	154	96.7
2	Female	06	3.3
	TOTAL	160	100.00

Source: Primary data.

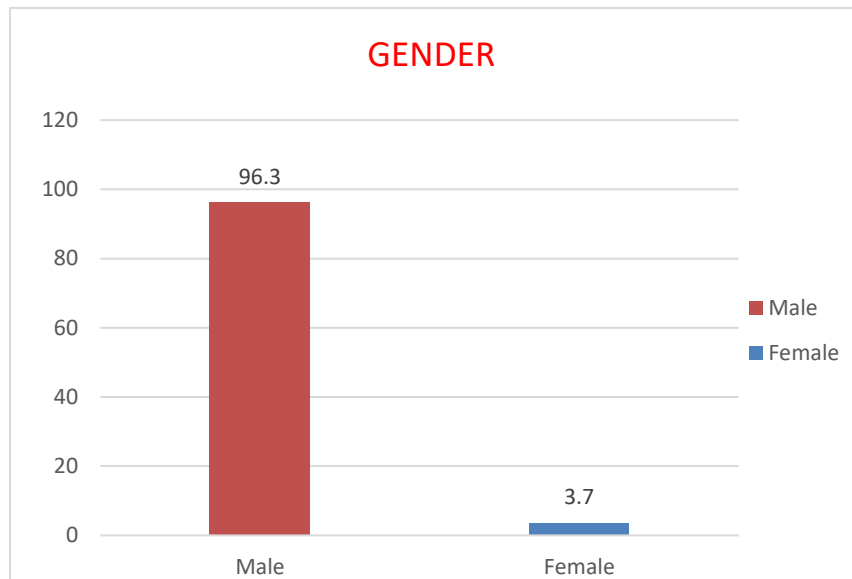


Chart 4.1.2: Gender of the respondents

Interpretation

From the above table it is interpreted that the number of male respondent is 96.3% and female respondent is 3.7%.

Inference

Majority (96.3%) of the respondents are Male.

Table 4.1.3: Education of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	SSLC	10	6.3
2	HSC	20	12.5
3	U.G	67	41.9
4	P.G	43	26.9
5	DIPLOMA	20	12.5
TOTAL			100.00

Source: Primary data.

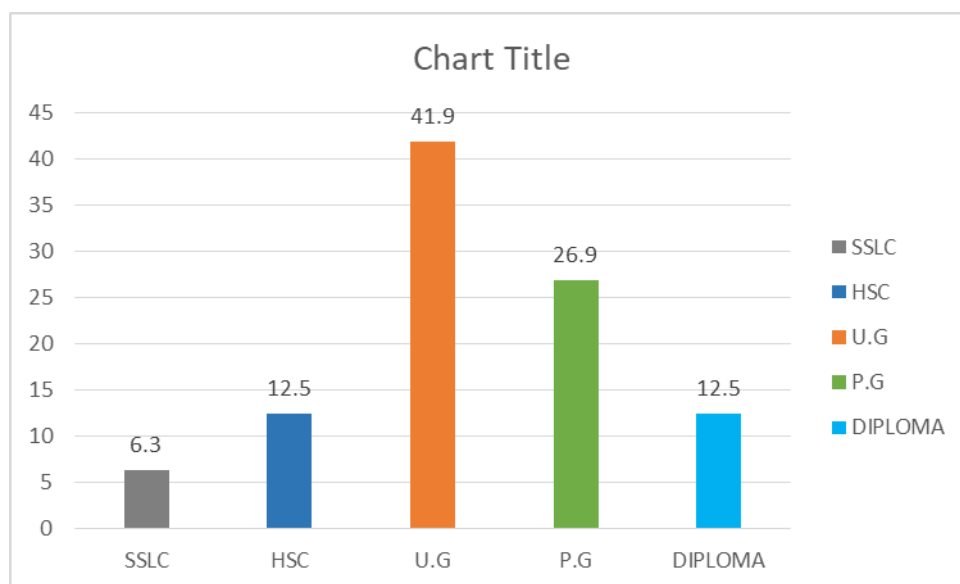


Chart 4.1.3: Education of the respondents

Interpretation

From the above table it is interpreted that the number of respondents SSLC Pass is 10.00%, HSC Pass is 20%, U.G is 67%, P.G is 43.00% and Diploma is 20%

Inference

Majority (67%) of the respondents are U.G.

Table 4.1.4: Designation of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	A.E/A.D.E	20	12.5
2	S.E/D.E	29	18.1
3	Lineman/Inspector	55	34.4
4	Contract works	22	13.8
5	Others	34	21.3
	TOTAL	160	100.00

Source: Primary data.

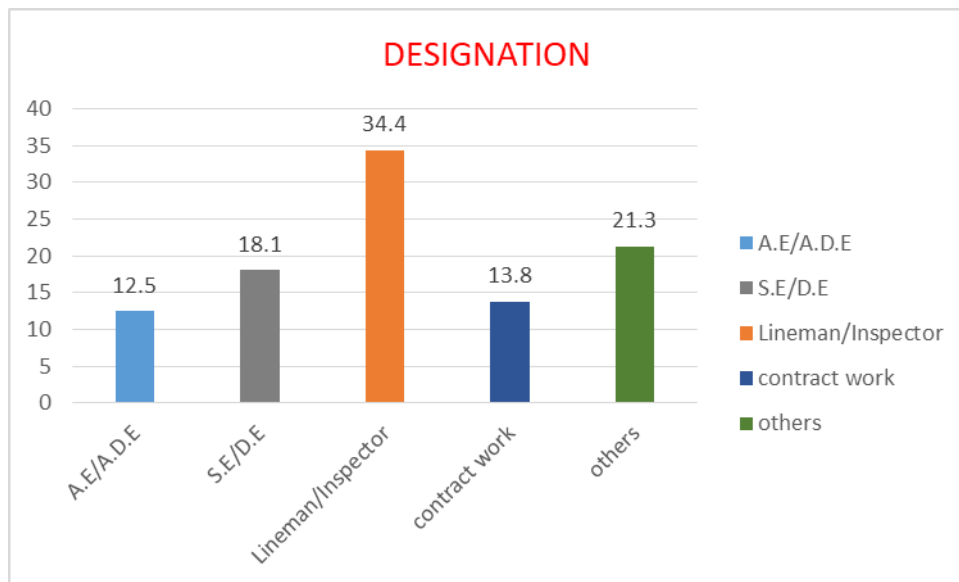


Table 4.1.4: Designation of the respondents

Interpretation

From the above table it is interpreted that the number of respondents were A.E/A.D.E is 12.5%, S.E/D.E is 18.1%, Lineman/Line inspector is 34.4%, contract is 13.8% and 21.3% others mention.

Inference

Majority (34.4%) of the respondents are lineman/inspector.

Table 4.1.5: Marital status of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Unmarried	93	58.1
2	Married	67	41.9
	TOTAL	160	100.00

Source: Primary data.

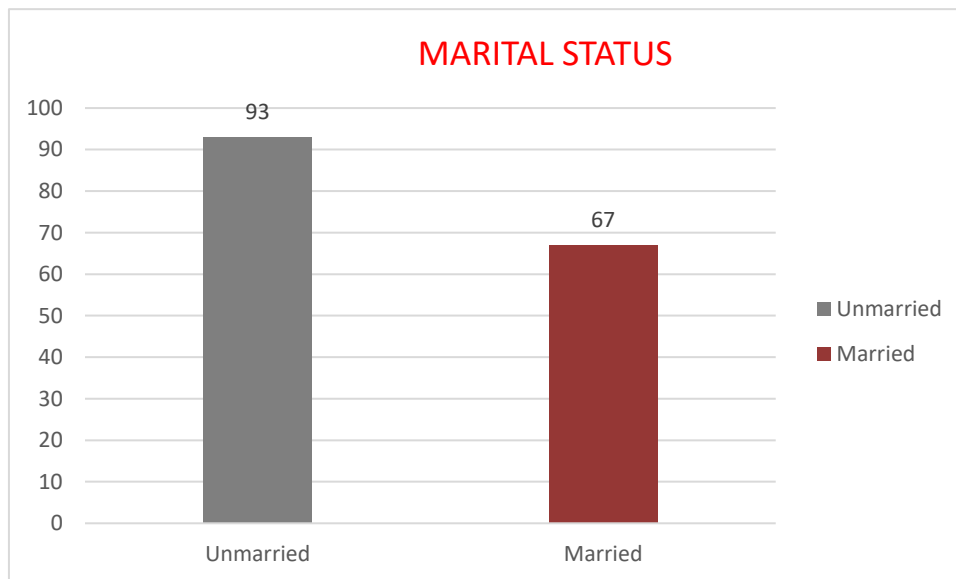


Chart 4.1.5: Marital status of the respondents

Interpretation

From the above table it is interpreted that the number of respondents were 93% in unmarried, 67% in married

Inference

Majority (93%) of the respondents are Unmarried.

Table 4.1.6: Income of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Less than 3 lakhs	56	35
2	3 to 6 lakhs	50	31.3
3	6 to 9 lakhs	38	23.7
4	Above 9L	16	10
	TOTAL	160	100.00

Source: Primary data.

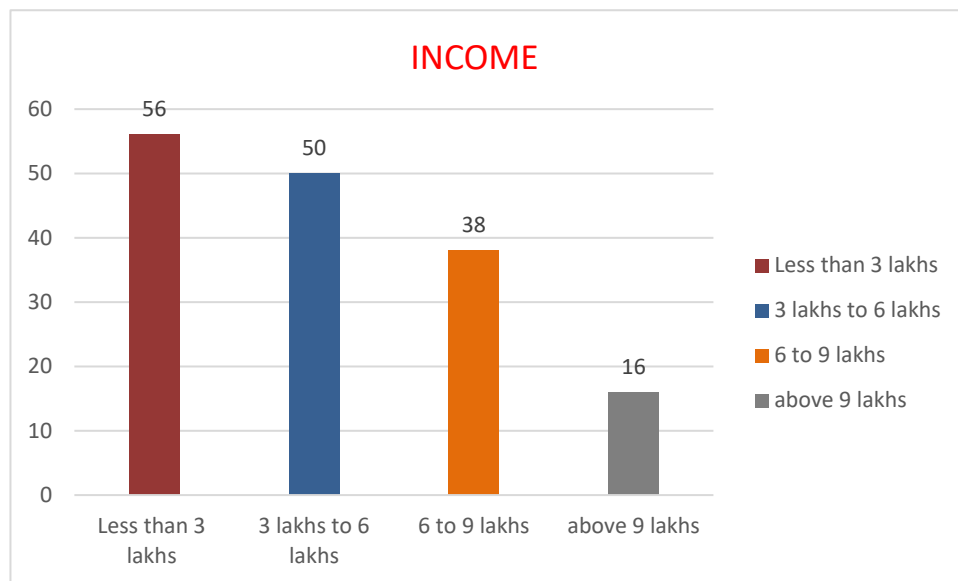


Chart 4.1.6: Income of the respondents

Interpretation

From the above table it is interpreted that the number of respondents were less than 3 lakhs is 56%, 3 to 6 lakhs is 50%, 6 to 9 lakhs is 38% and above 9 lakhs is 16% as mentioned.

Inference

Majority (56%) of the respondents are less than 3 lakhs.

Table 4.1.7: Experience of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Less than 5 years	60	37.5
2	5 years	48	30
3	More than 5 years	40	25
4	Above 10 years	12	7.5
	TOTAL	160	100.00

Source: Primary data.

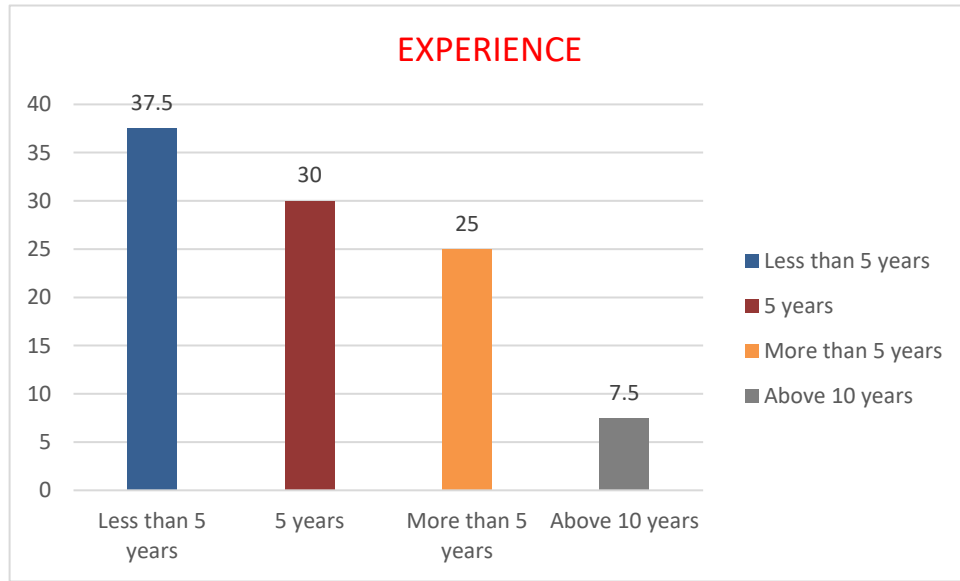


Table 4.1.7: Experience of the respondents

Interpretation

From the above table it is interpreted that the number of respondents were less than 5 years is 37.5%, 5 years is 30%, more than 5 years is 25% and above 10 years is 7.5% as mentioned.

Inference

Majority (37.5%) of the respondents are less than 5 years.

Table 4.1.8: Causes for breakdown of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Rainfall	22	13.8
2	Cyclone	48	30
3	Floods	22	43.8
4	Others	20	12.5
	TOTAL	160	100.00

Source: Primary data.

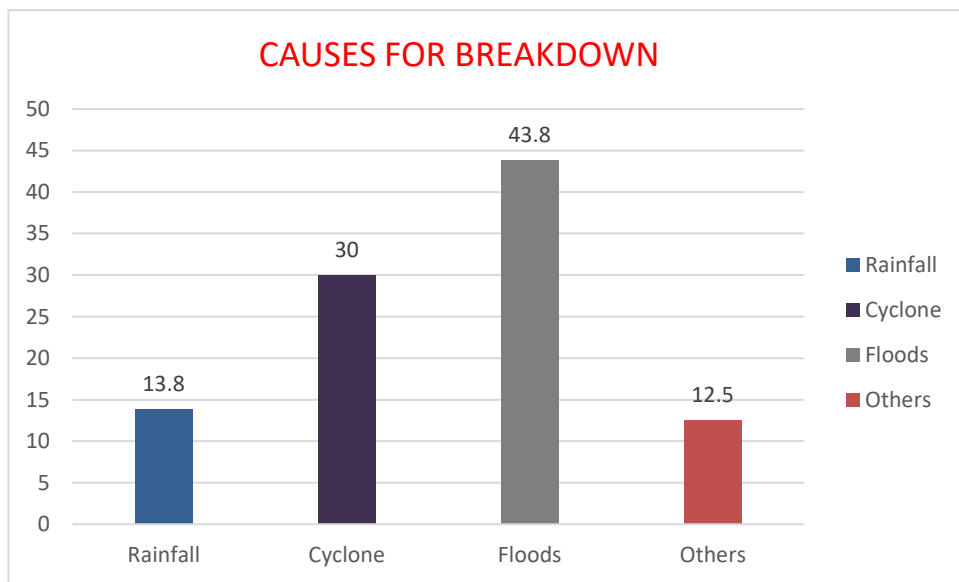


Chart 4.1.8: Causes for breakdown of the respondents

Interpretation

From the above table it is interpreted that the number of respondents were rainfall is 13.8%, cyclone is 30 %,then floods is 43.8% and 12.5% is others are mentioned.

Inference

Majority (43.8%) of the respondents are floods.

Table 4.1.9: Complaint Registration of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Online	15	9.4
2	Offline	10	6.2
3	Telecommunication	39	24.4
4	All the above	96	60
	TOTAL	160	100.00

SOURCE: Primary data.

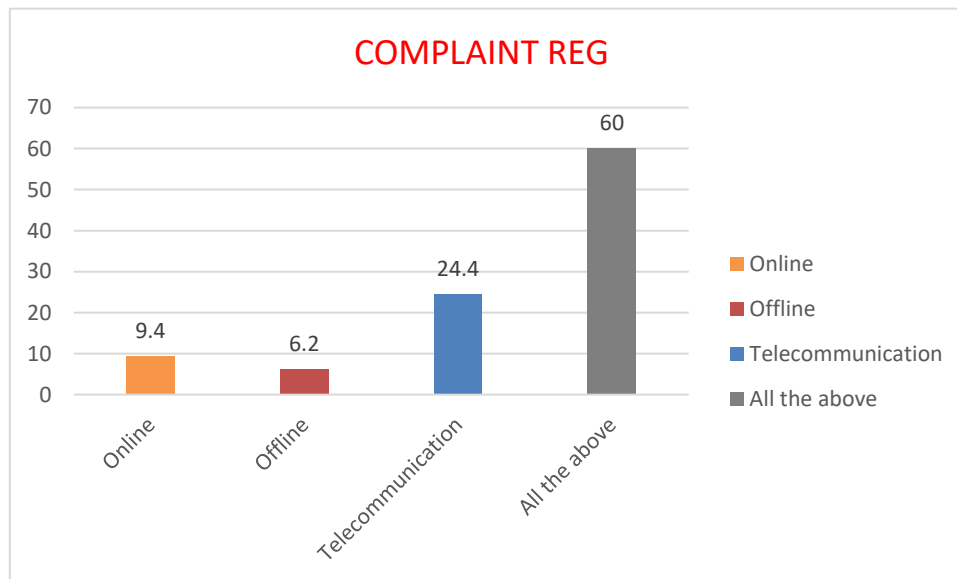


Chart 4.1.9: Complaint Registration of the respondents

Interpretation

From the above table it is interpreted that 9.4% of respondents Preferred by online, offline is 6.2%, telecommunication is 24.4% and all the above is 60% mentioned.

Inference

Majority (60%) of the respondents are Preferred all the above.

Table 4.1.10: suggesting earth wire of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Strongly Agree	96	60
2	Agree	30	18.8
3	Disagree	20	12.5
4	Strongly disagree	14	8.8
	TOTAL	160	100.00

SOURCE: Primary data.

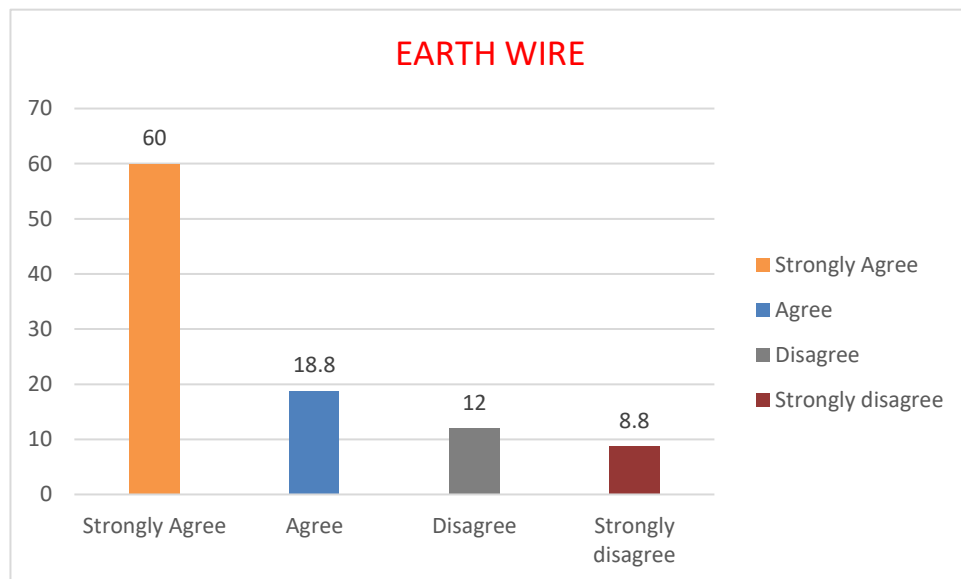


Chart 4.1.10: Suggesting earth wire of the respondents

Interpretation

From the above table it is interpreted that the 60% is strongly agree, 18.8% is agree, 12% is disagree, 8.8% is strongly disagree are mentioned.

Inference

Majority (60%) of the respondents are strongly agree.

Table 4.1.11: prevents from damage of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Strongly Agree	16	10
2	Agree	85	53.1
3	Neutral	37	23.1
4	Disagree	12	7.5
5	Strongly disagree	16	6.3
	TOTAL	160	100.00

SOURCE: Primary data.

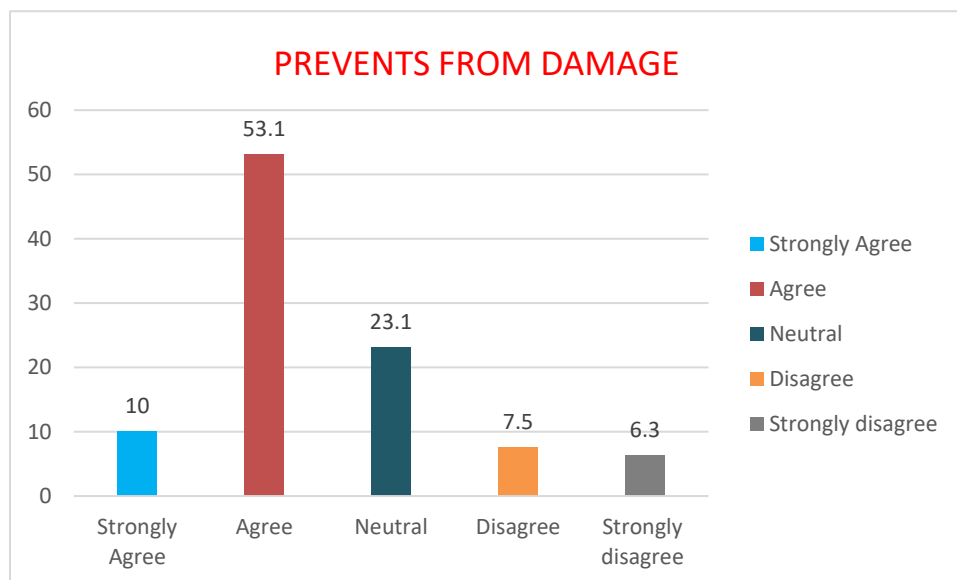


Chart 4.1.11: prevents from damage of the respondents

Interpretation

From the above table it is interpreted that the 10% is strongly agree then 53.1 % is agree, 23.1% is neutral 7.5% is disagree and 6.3% is strongly disagree.

Inference

Majority (53.1%) of the respondents are Preferred agree.

Table 4.1.12: Time taken to solve of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	One hour	33	20.6
2	More than one	79	49.4
3	Two hours	27	16.9
4	More than two	21	13.1
	TOTAL	160	100.00

SOURCE: Primary data

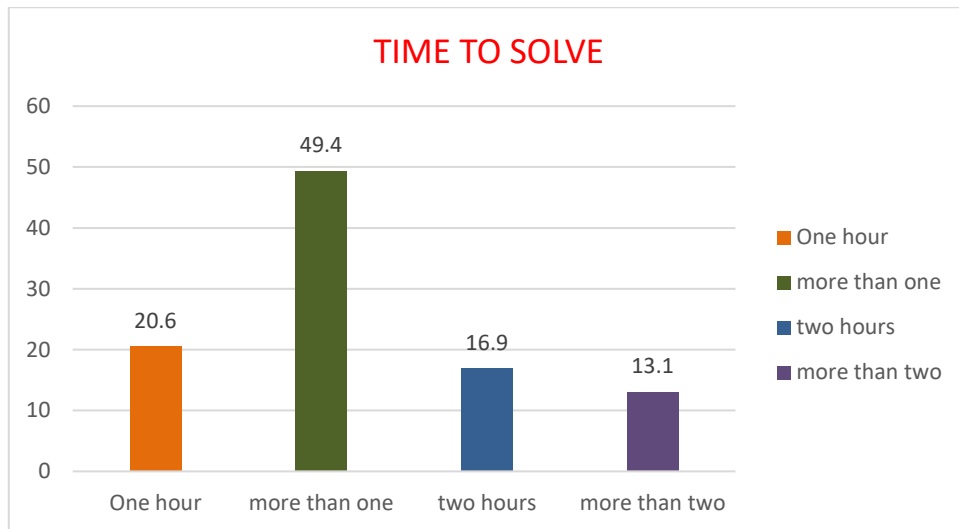


Chart 4.1.12: Time to solve of the respondents

Interpretation

From the above table it is interpreted that the 20.6% is one hour, 49.4% is more than one hour, 16.9% is two hours, 13.1% is more than two.

Inference

Majority (49.4%) of the respondents are preferred more than one

Table 4.1.13: power cut of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Lightning	90	66.4
2	Fuses burnt out	25	9.3
3	Tree limbs	24	11
4	Others	21	13.3
	TOTAL	160	100.00

SOURCE: Primary data.

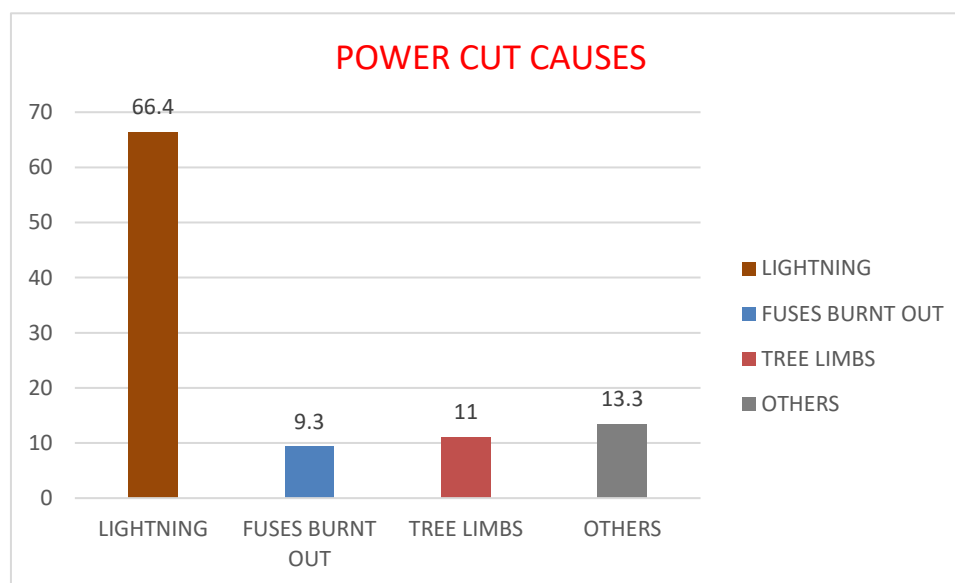


Chart 4.1.13: power cut of the respondents

Interpretation

From the above table it is interpreted 66.4% is lightning, 9.3% is fuses burnt out, 11% is tree limbs and 13.3% is others mentioned.

INFERENCE

Majority (66.4%) of the respondents are preferred more power cuts due to lightning.

Table 4.1.14: safety tools of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	PPE	19	66.4
2	Rubber gloves	20	9.3
3	Insulated tools	23	11
4	All the above	98	13.3
	TOTAL	160	100.00

SOURCE: Primary data.

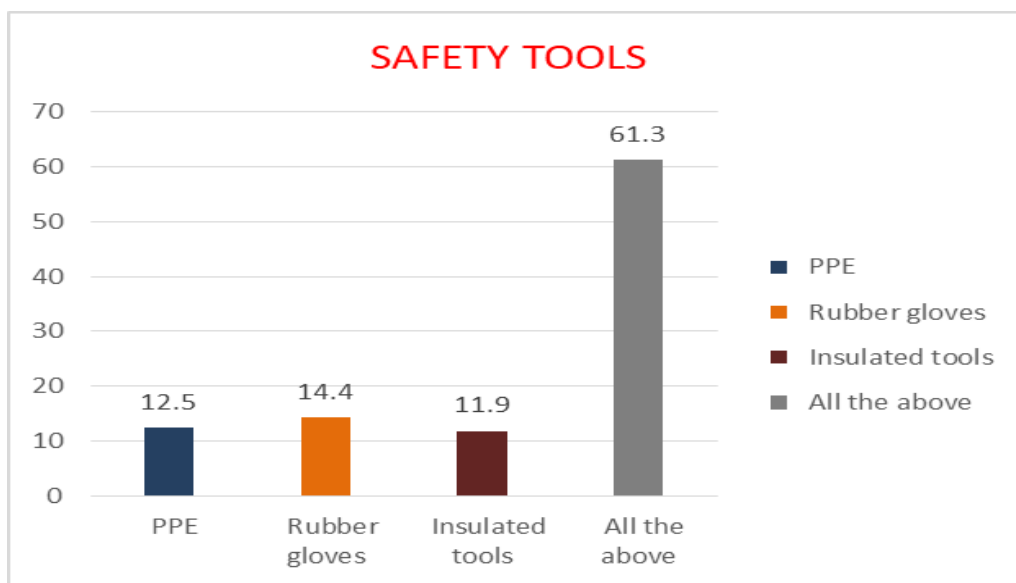


Chart 4.1.14: Safety tools of the respondents

Interpretation

From the above table it is interpreted 12.5% of respondents Preferred by PPE, 14.4% preferred rubber gloves, 11.9 % is insulated tools and 61.3% preferred all the above.

Inference

Majority (61.3%) of the respondents are Preferred all the above.

Table 4.1.15: First aid activities of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Turn off power	43	29.3
2	Cardiac arrest	26	11.2
3	Treatment for injury	50	32
4	All the above	41	27.5
	TOTAL	160	100.00

SOURCE: Primary data.

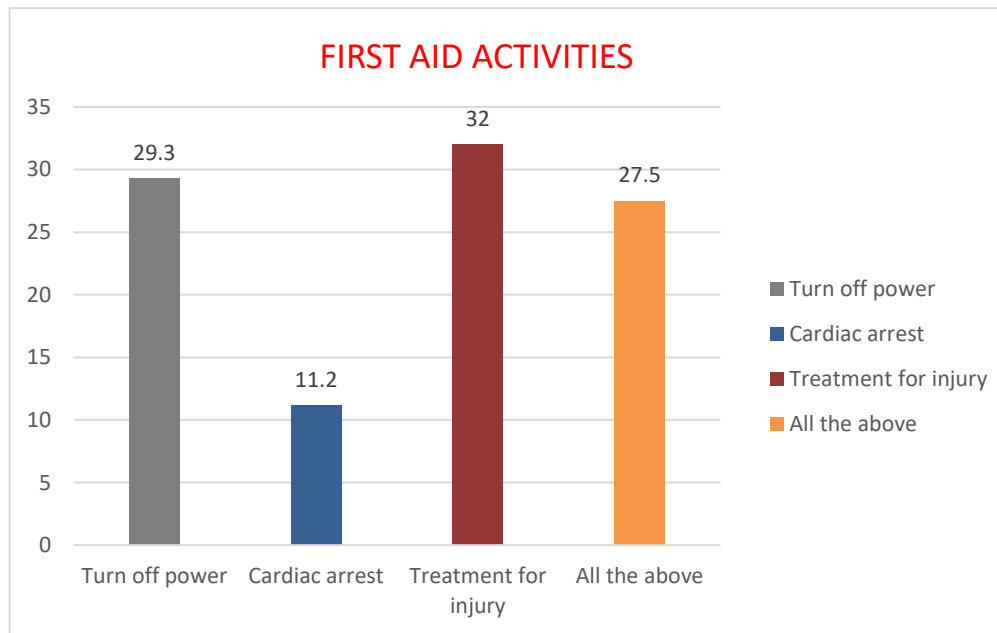


Chart 4.1.15: First aid activities of the respondents

Interpretation

From the above table it is interpreted 29.3% of respondents Preferred turn off power, 11.2% preferred cardiac arrest, 32% is treatment for injury and 27.5% is all the above.

Inference

Majority (32%) of the respondents are treatment for injury.

Table 4.1.16: Disconnects power supply of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Feeder tripping	14	8.8
2	Short circuit	33	20.6
3	Tripping	15	9.4
4	Both a & b	98	61.3
	TOTAL	160	100.00

Source: Primary data.

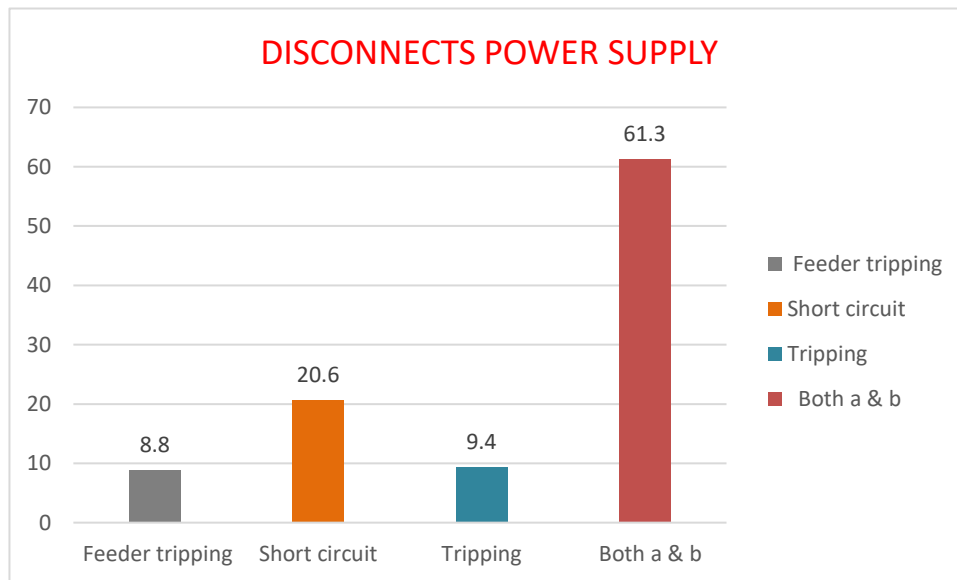


Chart 4.1.16: Disconnects power supply of the respondents

Interpretation

From the above table it is interpreted that the 8.8% of respondents says feeder tripping, 20.6% is short circuit, 9.4% is tripping, 61.3% is both A & B as mentioned.

Inference

Majority (61.3%) of the respondents says both A & B.

Table 4.1.17: Injuries results of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Electric shocks	35	21.9
2	Burns	8	5
3	Electrocution	20	12.5
4	All the above	97	60.6
	TOTAL	160	100.00

Source: Primary data.

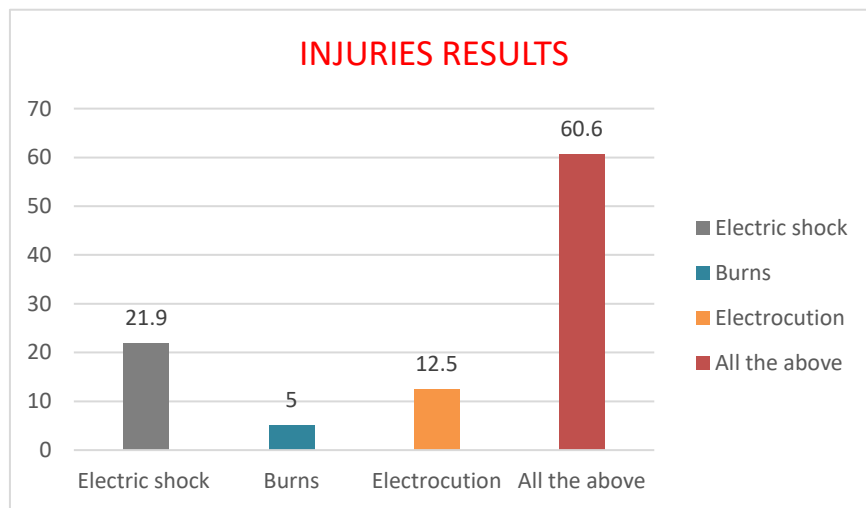


Chart 4.1.17: Injuries results of the respondents

Interpretation

From the above table it is interpreted that the 21.9% of respondents says electric shocks, 5% is burns, 12.5% is electrocution, 60.6% is all the above.

Inference

Majority (60.6%) of the respondents says all the above.

Table 4.1.18: Natural calamities of the respondent

S NO	Particulars	No. of Respondents	Percentage
1	Strongly agree	45	35.6
2	Agree	42	32.3
3	Neutral	30	15
4	Disagree	23	9.1
5	Strongly disagree	20	8
	TOTAL	160	100.00

Source: Primary data.

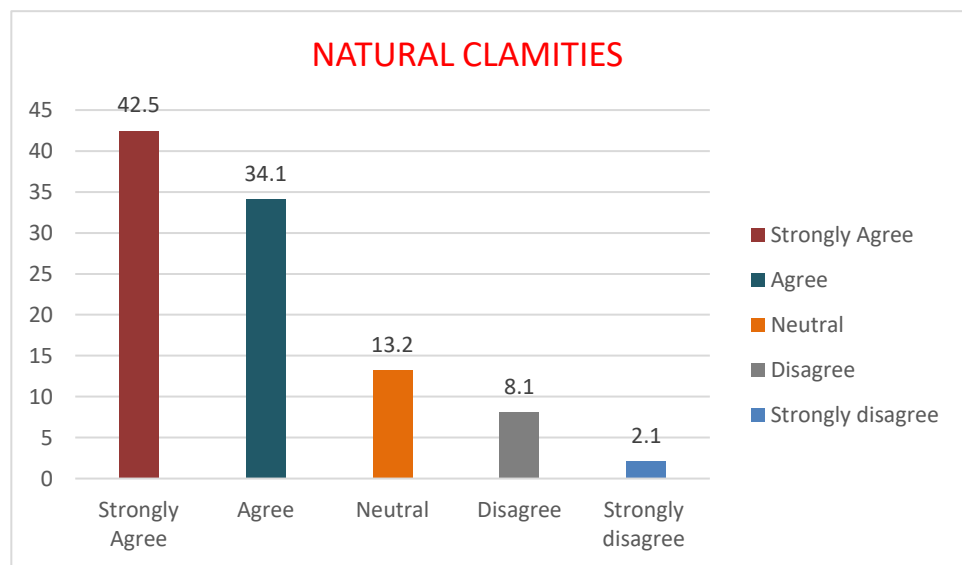


Chart 4.1.18: Natural calamities of the respondent

Interpretation

From the above table it is interpreted that the number of respondents says 35.6% is strongly agree, 32.3% is agree, 15% is neutral then 9.1% is disagree and finally 8% is strongly disagree.

Inference

Majority (35.6%) of the respondents is strongly agree.

Table 4. 1.19: PPE is important of the respondents

S NO	Particulars	No. of Respondents	Percentage
1	Strongly agree	63	42.5
2	Agree	45	34.1
3	Neutral	30	13.2
4	Disagree	18	8.1
5	Strongly Disagree	4	2.1
	TOTAL	160	100.00

Source: Primary data.

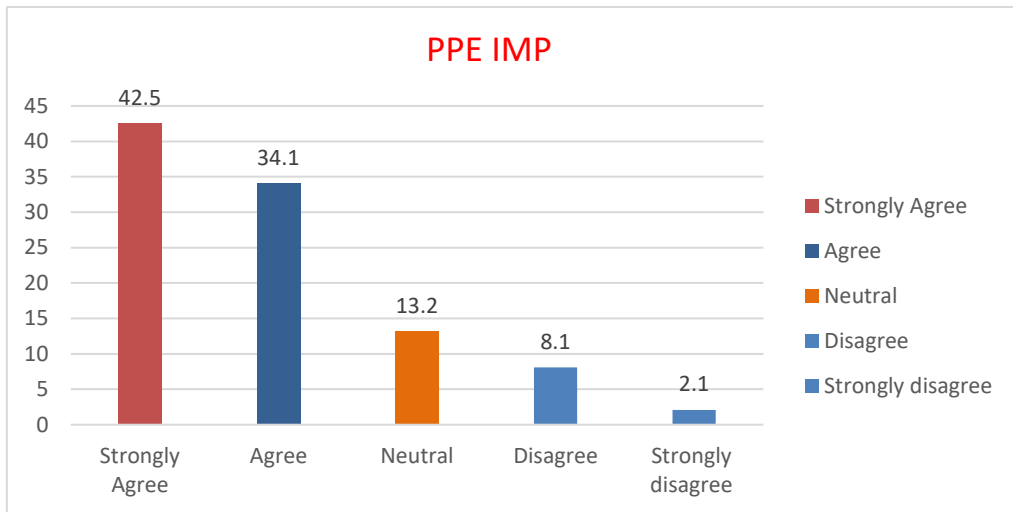


Chart 4. 1.19: PPE is important of the respondents

Interpretation

From the above table it is interpreted that the 42.5% of respondents says strongly agree, 34.1% says agree, 13.2% says neutral, 8.1% says disagree, 2.1% says strongly disagree.

Inference

Majority (42.5%) of the respondents says strongly agree.

Table 4.1.20: Responsibility of industry about short circuit respondents

S NO	Particulars	No. of Respondents	Percentage
1	Strongly agree	44	33.3
2	Agree	54	39.2
3	Neutral	20	9
4	Disagree	30	12
5	Strongly disagree	12	6.5
	TOTAL	160	100.00

Source: Primary data.

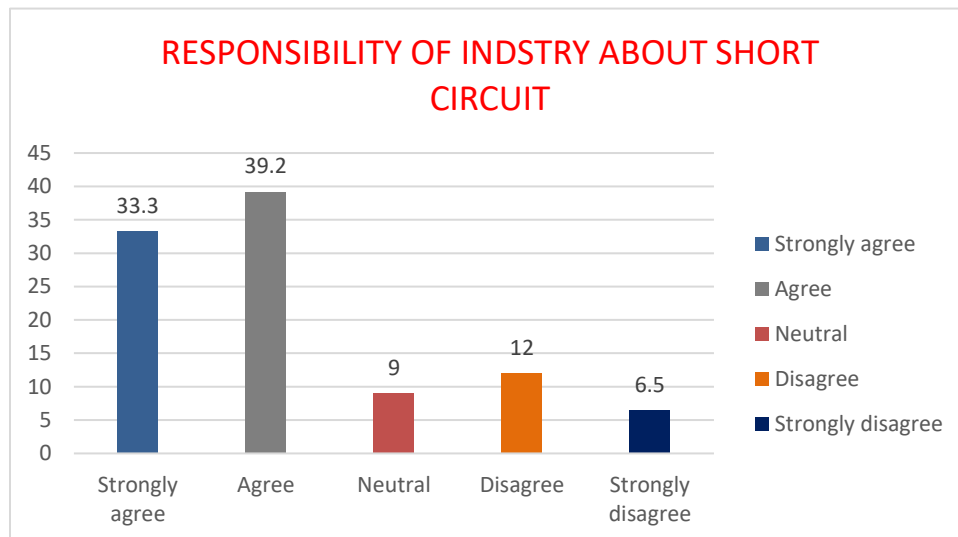


Chart 4.1.20: Responsibility of industry about short circuit respondents

Interpretation

From the above table it is interpreted that the 33.3% of respondents says strongly agree, 39.2% says agree, 9% says neutral, 12% says disagree, 6.5% says strongly disagree.

Inference

Majority (39.2%) of the respondents says strongly agree.

Table 4.1.21: Transformers consists of ceramic respondents

S NO	Particulars	No. of Respondents	Percentage
1	Highly satisfied	93	56.3
2	Satisfied	37	23.2
3	Neutral	14	11.2
4	Dissatisfied	10	5.1
5	Highly Dissatisfied	6	4.2
	TOTAL	160	100.00

Source: Primary data.

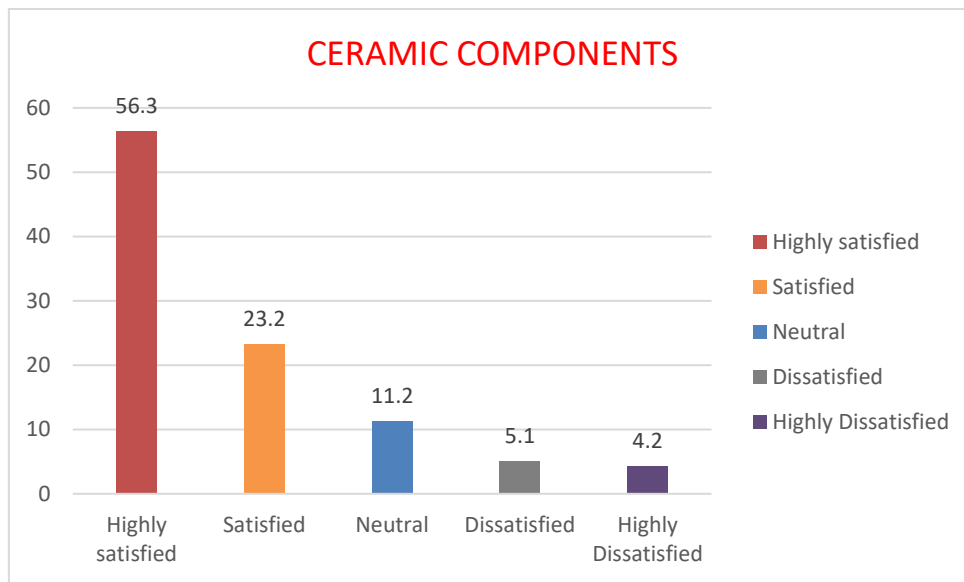


Chart 4.1.21: Transformers consists of ceramic respondents

Interpretation

From the above table it is interpreted that the 56.3% of respondents says highly satisfied, 23.2% says satisfied, 11.2% says neutral, 5.1% says dissatisfied, 4.2% says highly satisfied.

Inference

Majority (56.3%) of the respondents says highly satisfied.

CHAPTER 5

5.1 FINDINGS

- 1) Majority (46%) of the respondents are age between 38 to 48 years.
- 2) Majority (96.3%) of the respondents are Male.
- 3) Majority (67%) of the respondents are U.G.
- 4) Majority (34.4%) of the respondents are lineman/inspector.
- 5) Majority (93%) of the respondents are unmarried.
- 6) Majority (56%) of the respondents are less than 3 lakhs.
- 7) Majority (37.5%) of the respondents are less than 5 years.
- 8) Majority (43.8%) of the respondents are Preferred by floods.
- 9) Majority (60%) of the respondents says all the above.
- 10) Majority (60%) of the respondents are strongly agree.
- 11) Majority (53.1%) of the respondents are preferred agree.
- 12) Majority (49.4%) of the respondents are preferred more than one.
- 13) Majority (66.4%) of the respondents are preferred more power cuts due to lightning.
- 14) Majority (61.3%) of the respondents are preferred all the above.
- 15) Majority (32%) of the respondents are treatment for injury.

- 16) Majority (61.3%) of the respondents says both A & B.
- 17) Majority (60.6%) of the respondents says all the above.
- 18) Majority (35.6%) of the respondents are strongly agree.
- 19) Majority (42.5%) of the respondents says strongly agree.
- 20) Majority (39.2%) of the respondents says strongly agree
- 21) Majority (56.3%) of the respondents says highly satisfied

5.2 SUGGESTION

- Every worker in the electrical workplace area should be encouraged to use the personal protective devices and check all equipment before use during work time.
- Ongoing periodic health education programs carried out by the occupational health nurse to raise the awareness of electricity workers about electrical health hazards.
- Periodic training on hazards prevention and electrical safety as well as first aids should be sustained for electricity workers.
- The developed illustrated booklet should be distributed and implemented in the different electrical workplaces focusing on necessary knowledge and practices regarding prevention of electrical health hazards and the proper using of personal protective equipment.
- Conduct further researches to investigate the contributory factors leading to occupational health hazards in different electrical sectors in Egypt are needed and on large sample.

5.3: CONCLUSION

The overview of electrical and safety tips revealed a level of awareness of electrical hazards and safety measures knowledge among electricity users. From the study, it has become cleared that many users of electricity are not well informed or aware about electricity hazards and safety measures. The implications of these are seen in number of electricity accidents witnessed in homes and offices. To avoid this, everyone both at offices and at homes must help spread this awareness of electrical hazards and safety.

The present study enabled us to characterize stress at work among electrical workers, its associated factors, as well as their associations with health status. The external validity of this study can be extended for workers of electrician companies having similar characteristics regarding demographic, working conditions and work organization. Although the levels of perceived stress aren't considered too high, in view of the effects deriving from continuous exposure, we suggest the implementation of measures aiming to improve the work organization and the psychosocial environment, so that worker's needs and expectations are balanced with work demands. Such measures should address the factors identified as the major sources of stress. Special attention should be given to remuneration and practice of physical activity, which was also associated with stress at work, independently of any other variable.

Stress at work was significantly associated with physical and mental health status. To improve health of electric utility workers, actions are suggested to decrease stress by remuneration and an appropriate practice of physical activity aiming reduction of BMI.

Key words: Occupational health, Stress at work, Psycho social job factors, Workload, Mental health, Electric utility worker.

REFERENCE

References:

- European Commission (2000) Guidance on Work Related Stress. Spice of Life, or Kiss of Death? Office for Official Publications of the European Commission, Luxembourg.
- Kompier MAJ (2006) New systems of work organization and workers' health. *Scand J Work Environ Health* 32, 421–30.
- Härmä M, Kompier MAJ, Vahtera J (2006) Work-related stress and health —risks, mechanisms and countermeasures. *Scand J Work Environ Health* 32, 413–9.
- Nogueira VA (1999) Reestruturação do Setor Elétrico: um estudo qualitativo das condições de trabalho e saúde dos eletricitários frente à privatização da CERJ Master Thesis. Escola Nacional de Saúde Pública, Rio de Janeiro. <http://portalteses.cict.fiocruz.br/pdf/FIOCRUZ/1999/nogueiravam/capa.pdf>. Accessed July 4, 2007.
- Martinez MC, Latorre MRDO (2008) Saúde e capacidade para o trabalho de eletricitários do Estado de São Paulo. *Ciênc Saúde Coletiva* 13,1061–73 (in Portuguese).
- Batra PE, Ioannides MG (2001) Electric accidents in the production, transmission, and distribution of electric energy: a review of the literature. *Int J Occup Safety Ergonomics* 7, 285–307.
- Levya GV, Elio MN, Arellano OL (2005) La producción de energía eléctrica y la salud de los trabajadores. *Salud trab (Maracay)* 13,19–36 (i Spanish).
- Broadbent DE, Broadbent MHP, Male JC, Jones MR (1985) Health of workers exposed to electric fields. *Br J Ind Med* 42, 75–84.
- Chevalier A, Sourques M, Coing F, Dab W, Lambrozo J (1999) Absenteeism and mortality of workers exposed to electromagnetic fields in the French Electricity

Company. Occup Med 49, 571–24.

- Johansen C (2004) Electromagnetic fields and health effects —epidemiologic studies of cancer, diseases of central nervous system and arrhythmia-related heart disease. Scand J Work Environ Health 30(suppl 1), 1–80.
- Florindo AA, Latorre MRDO (2003) Validation and reliability of the Baecke questionnaire for the evaluation of habitual physical activity in adult men. Rev Bras Med Esporte 9, 129–35.
- Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG (2001) AUDIT — cuestionario de identificación de los trastornos debidos al consumo de alcohol: pautas para su utilización en atención primaria, Organización Mundial de la Salud, Ginebra (in Spanish).
- WHO —World Health Organization. The WHO Global Database on Body Mass Index (BMI) 2006. http://www.who.int/bmi/index.jsp?introPage=intro_1.html. Accessed January 29, 2008.
- Ware JE, Kosinski M (2001) Interpreting SF-36 summary health measures: a response. Qual Life Res 10, 405–13.
- Ciconelli RM, Ferraz MB, Santos W, Meirão I, Quaresma MR (1999) Tradução para a língua portuguesa e validação do questionário genérico de avaliação de qualidade de vida SF-36 (Brasil SF-36). Rev Bras Reumatol 39, 143–50 (in Portuguese).
- Paschoal T, Tamayo A (2004) Validação da escala de estresse no trabalho. Estud Psicol (Natal) 9, 45–52 (in Portuguese).
- Houtman I, Jettinghoff K, Cedilb L (2007) A model on work-related stress. In: Raising awareness of stress at work in developing countries: a modern hazard in a traditional working environment: advice to employer and worker representatives, 15–22, World Health Organization, Geneva.
- Michie S, Williams S (2003) Reducing work related psychological ill health and

sickness absence: a systematic literature review. *Occup Environ Med* 60, 3–9.

- Karasek R, Theorell T (1990) Healthy work: stress, productivity, and the reconstruction of working life. In: *Health, productivity and work life*, 1–30. Basic Books, USA.
- Fowler Jr DJ (1990) Nonresponse: implementing a sample design. In: *Survey Research Methods*, 45–60, SAGE, California.
- Elaine L. Chao, John L. Henshaw Controlling Electrical hazard, USA: Department of labour, Occupational safety and health Administration, OSHA 3075, 2002.
- HSE, "Health Safety Executive," Saturday October 2016. [Online]. Available: www.hse.gov.uk.
- "Study Guide Electrical Safety hazards awareness," Safety improvement project.
- W. Kouwenhoven, "Human Safety and Electric Shock, Electrical Safety practise," Instrument Society of America November 1968.
- B. 7671:2008, Requirements For electrical installations British Standards institution, 17th Edition ed., British: IET wiring Regulations, 2011.
- "Safety and health magazine," Friday October 2016. [Online]. Available: www.safetyandhealthmagazine.com/article/avoid-electrical-hazards-in-the-office-2.
- Josh, "Best Practises," 30 May 2007. [Online]. Available: <http://ehstoday.com/safety/best-practises/ehs-imp-66770>. [Accessed 22 October 2016].
- [Online]. Available: www.highspeedtraining.co.uk/hub/electrical-hazards-workplace/.
- OSHA, Electrical Safety Related Work Practices, 29 CFR Part , 1910.
- Ralph H. Lee, "Electrical Safety In Industrial Plants," E. I duPont deNemours & Company, 1971.

BIBLIOGRAPHY

- 1) www.highspeedtraining.co.uk/hub/electrical-hazards.
- 2) https://www.arc.gov/assets/research_reports/AppalachiaThenAndNowCompiledReports.
- 3) <http://www.iitmicrogrid.net/education/The%20Smart%20Grid%20Workforce%20of%20the%20Future>.
- 4) <https://www.nga.org/files/live/sites/NGA/files/pdf/2014/1410TheCybersecurityWorkforce>
- 5) <https://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast-nitrd-report-2010>.
- 6) [www.highspeedtraining.co.uk/hub/electrical-hazards workplace/](http://www.highspeedtraining.co.uk/hub/electrical-hazards-workplace/).
- 7) [http://www. who.int/bmi/index.jsp?introPage=intro_1.html](http://www.who.int/bmi/index.jsp?introPage=intro_1.html).

APPENDIX (Questionnaire)

Personal Details:

1. Name:

2. Gender

1) Male

2) Female

3. Marital Status

1) Married

2) Unmarried

4. Age

1) 18-28yrs

2) 28-38yrs

3) 38-48yrs

4) 48 and above

5. Education

1) SSLC

2) HSC

3) U.G.

4) P.G.

5) Diploma

6. Income

- 1) Less than 3 lakhs 2) 3 lakhs to 6 lakhs
3) 6 lakhs to 9 lakhs 4) 9 lakhs to 12 lakhs

7. Designation

- 1) A.E/A.D.E. 2) S.E/D.E.
3) Lineman/Line Inspector 4) Contract works
5) Others

8. Experience

- 1) Less than 5 YRS 2) 5 YRS
3) More than 5 YRS 4) Above 10 YRS

9. Which effects more causes for Electricity break down?

- (1) Rainfall (2) Cyclone
(3) Floods (4) Others

10. Mode of compliant Registration?

- (1) Online (2) Offline
(3) Telecommunication (4) All the above

11. Do u suggest Earth wire?

- (1) Strongly agree (2) Agree
(3) Disagree (4) strongly disagree

12. Is the Earth wire prevents from damage during cyclone?

- (1) Strongly agree (2) Agree

- (3) Neutral (4) Disagree
(5) Strongly disagree

13. How much time did it take to solve the problem?

- (1) One hour (2) More than one hour
(3) Two hours (4) More than two hours

14. Why power cut occur every time when it is rained?

- (1) Lightning (2) Fuses burnt out
(3) Tree limbs /Branches fallen (4) others

15. What kind of safety tools did u carry with you in the work field?

- (1) Rubber Gloves (2) Insulated Tools
- (3) PPE (4) All the above

16. What are the primary first aid-activities done during electric shocks?

- (1) Turn off the source
- (2) Cardiac Arrest
- (3) Consciousness
- (4) Treatment for injury
- (5) Prevent victim and others from risk

17. Why does the Electricity board disconnects its power supply when it is rained?

- (1) Feeder Tripping (2) Short circuit
(3) Tripping (4) Both A and B

18. What kinds of injuries result from electrical currents?

- (1) Electric shock (2) Burns
- (3) Electrocution (4) All the above

19. Rate your level of agreement with the following statements:

STATEMENT	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Natural calamities are major cause for major electrical break down.					
PPE is important in work field.					
Short circuit is not responsible for fire accidents in industries.					
Electric transformers consist of ceramic components.					

20. Give your response on what type of precautions do u suggest public during cyclones?
