HEALTH AND SAFETY RELATED DISASTER RESILIENCE IN APPAREL INDUSTRY IN SRI LANKA

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DEDICATION

I DEDICATE THIS PIECE OF WORK TO MY PARENTS…….

DECLARATION

I hereby declare that, this report submission is my own work and to the best of my knowledge is does not contain and material previously published or written by any other person or material which substantial extent has been accepted for the award of any degree or diploma of a university or any other institution of higher education, except where reference are mentioned.

Signed: .....(Candidate) Date: .....

Signed: ……. (Supervisor) Date: ..…….....

ABSTRACT

Apparel industry is often connected with international supply chains and their economic performance meaningfully depends on the incomes generated through international trade. Economic cycles are internationally interrelated, which means that business disruptions of apparel industry due to local disasters can have an influence on markets and initiatives in other regions. The risks for the private segment are therefore not limited to single initiatives, sectors or industries; however, this can have serious significances on complete economies. The advantage of making policy initiatives in this concern will get highlighted, and this study will subsidize to the development of apparel industry competitiveness since Sri Lankan apparel industry want empirical data of this occurrence. Also they need to recognize how to integrate these concepts into adaptive capacities in apparel industry towards disaster resilience in Sri Lanka. Therefore, the apparel sector business organizations would be able to introduce disaster management intervention in concert with the business objectives. Therefore, this study will attempt to achieve the condition of having such studies in eastern countries to a certain extent then most of the studies in this environment have been directed in western culture. Sample of 50 garment manufacturing factories were selected since a population of all medium & large size of factories in free trade zone in Sri Lanka. The researcher was practiced open-ended and closed-ended questionnaires and interviews by the primary data collection techniques. Also the researcher was used associate studied journal articles, annual reports and printed books as the secondary data collection methods. SPSS software was used to analyze the collected data through questionnaires. According to analysis, apparel manufacturing companies need to provide proper and industry standard health and safety awareness training to all managers, supervisors, employees, contractors and suppliers. Sri Lankan apparel industry need to reinforce organizational employees, managers and supervisors' knowledge of their job related responsibilities under the occupational health and safety act and the industrial sector employees' rights guaranteed by the act. They need to provide industry related practical knowledge to the HSE professionals' involvement procedure to the disaster resilience in apparel industry in Sri Lanka.

Key Words: Adaptive capacities, Apparel Industry, Disaster Resilience, Health & Safety

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LIST OF ABBREVIATIONS

Abbreviation	Description
AI	Apparel Industry
BOI	Board of Investment
EP	Emergency Preparedness
EU	European Union
FDI	Foreign Direct Investments
GDP	Gross Domestic Product
H&S	Health and Safety
HSAT	Health & Safety Awareness and Training
IHSEP	Involvement of HSE Professionals
ILO	International Labor Organization
IPSS	Implementation of Preventive Safety Systems
IWH	Institute for Work and Health
LADWP	Los Angeles Department of Water and Energy
MCEER	Multidisciplinary Center for Earthquake Engineering & Research
MFA	Multi Fibre Agreement
TOSE	Technical, Organizational, Social and Monetary
SBA	Small Business Association
SC	Safety Culture
WRAP	Worldwide Responsible Accredited Production

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CHAPTER 1 - INTRODUCTION

1.1 Background of the Study

People typically see that financial management is located at greater level and environmental difficulties and disasters at the lower level when categorizing of disaster management system in apparel industry in Sri Lanka (Shimizu, 2012). Through natural and man-made disaster management in apparel industry, management method is playing a critical function in a Sri Lanka's apparel industry (Dharmasiri and Ranasinghe, 2015). If financial management is allocating with the financial plan of a business, and high-quality control with the sustaining of its products and methods, then it is caused that disaster resilience is coping with the environmental situations that the company controls in (Tidball and Krasny, 2015).

Disaster can be described as an extreme disruption of the functioning of a community or a society. Disasters involve wide ranging human, material, economic or environmental affects, which exceed the potential of the affected community or society to manage the usage of its own assets (Kapucu, Hawkins and Rivera, 2013). Even though these are an essential part of those communities, apparel industry is not taken into consideration for those applications (Silva, 2012).

Disaster occasions are pending problems and unresolved problems of development. This creates a need within the development process in apparel industry in Sri Lanka to have an awesome arrangement of concern in reducing disaster risk (Dharmasiri and Ranasinghe, 2015). Consequently, being resilient to disaster is a modern requirement a purpose to reduce the risk and impact of those threats and to growth the safety and health of their citizens, cities and their groups must be more resilient and prepared to cope with the threats head-on (Kapucu, Hawkins and Rivera, 2013).

Many of the national climate changes trade adaptation plans' demands the need of addressing the growing threat of intense events and failures which are the critical role of neighborhood communities in apparel industry (Wu and Sivalogathasan, 2013). Despite the fact that numerous projects had been applied to build disaster resilient groups that associated with the clothing enterprise whether or not these initiatives are shaped with good enough accounts of the expectancies of human beings on disaster resiliencies is questionable (Showstack, 2016). Therefore, understanding of

community's belief and elements which made them being resilient to secure ups will open up ventures to disaster resilience system in apparel industry and to make system capable to address screw ups and consequent adverse occasions (Shimizu, 2012).

1.2 Introduction on the apparel industry in Sri Lanka

Sri Lanka's apparel industry began to grow notably in the 1980 as an alternative to India's apparel manufacturers, because of open economic policy in addition to the exchange and investment friendly environment (Silva, 2012). Under the Multi Fibre Agreement, quota regime Sri Lanka has become an attractive new venue for organizations. In 1985, Martin trust, one of the pioneers inside the development of 'speed sourcing' for the American fashion retail sector, started out running with Sri Lankan textile and apparel businesses (Dharmasiri and Ranasinghe, 2015). In 1986 and 1987, he established joint venture partnerships with The Omar group (formerly called LM Apparels and a part of the Brandix group) and The Amalean organization which helped make the country greater competitive through expertise transfers, and attracting more foreign investors (Wu and Sivalogathasan, 2013). These were nearly two dozen joint venture companies in Sri Lanka which made the country competitive in the apparel sector, which includes Trust partnership with German brassiere maker, Triumph international and Sri Lankan agency, MAS Holdings, to create a brand new undertaking known as Bodyline (Abayasekara, 2013).

While the US and different countries removed quantitative regulations on apparels produced in China, many apparel centers in Sri Lanka were consolidated. As of 2010, most of the exports to US are from MAS or Brandix, with smaller quantities coming from the Hirdaramani group & Jay Jay Turbines groups. Collectively, those three companies account for a majority of the costs of exports of apparels to US market (Wu and Sivalogathasan, 2013).

1.3 Identification of the research problem

In present period, extreme natural occasions have shown important damage and economic losses in the Asia-Pacific region which was caused to the private sector. The importance for private businesses comprises destruction of property and equipment, and damage to stock (Showstack, 2016). Furthermore, business proprietors face income losses from business disruptions and rising operational costs.

The loss in marketplace share due to customers changing to competitors, movement of skilled employees and severed relationships with suppliers and retailers can disturb long-term economic sustainability or even lead to closure of businesses.

Therefore, likely to be located in risk disposed areas and with less investment in disaster resilience or business steadiness management, apparel industry is particularly vulnerable. In a number of countries in South Asia, apparel industry contributes with approximately 60% to 70% the economy, which illustrates their main role for sustainable development in companion countries (Dharmasiri and Ranasinghe, 2015). Apparel industry is often connected with international supply chains and their economic performance meaningfully depends on the incomes generated through international trade. Economic cycles are internationally interrelated, which means that business disruptions of apparel industry due to local disasters can have an influence on markets and initiatives in other regions. The risks for the private segment are not limited to single initiatives, sectors or industries; however, those risks can have serious significances on complete economies.

Furthermore, the floods in Sri Lanka, India, Thailand, etc. have disaster risks progressively been professed as competitive factors by international investors when choosing a supplier or a production site. Investment in disaster risk management decreases damage and losses borne by apparel industry and strengthens industries and decreases its cost.

1.4 Justification of the problem

First, there is a need for more comprehensive and integrative attempts to conceptualize the concepts of adaptive capacities (which are the capacity of a system to adapt if the environment where the system exists is changing) in apparel industry towards health and safety related disaster resilience in Sri Lanka. Therefore, the study will bridge the knowledge gap.

The advantage of making policy initiatives in this concern will get highlighted, and this study will help to the development of apparel industry competitiveness. Also garments need to recognize how to integrate the concepts into adaptive capacities in apparel industry towards health and safety related disaster resilience in Sri Lanka.

Therefore, the apparel sector business organizations would be able to introduce disaster management intervention in concert with the business objectives.

Finally, this study will attempt to achieve the condition of related researches carried out in eastern countries to a certain extent. Then most of the researches that related to apparel industry have been directed in western culture.

1.5 Research questions

- What is disaster resilience and the concepts associated with health and safety related disaster resilience in apparel industry in Sri Lanka?
- How well apparel industry has applied health and safety management strategies and practices in Sri Lanka?
- Recommendations for health and safety related disaster resilience of apparel industry in Sri Lanka?

1.6 Research aim and objectives

1.6.1 Research aim

Main aim of this research report is to examine the adaptive capacities towards health and safety related disaster resilience in apparel industry in Sri Lanka with practical and conceptual practices.

1.6.2 Research objectives

The researcher is identified following objectives to achieve the aim.

- To identify the concepts associated with health and safety related disaster resilience in apparel industry in Sri Lanka
- To identify strategies and practices of health and safety management in apparel industry in Sri Lanka relating to disaster resilience.
- To give recommendations for health and safety related disaster resilience in apply apparel industry in Sri Lanka.

1.7 Scope and Limitations of the Research

The scope of the project was the boundary of the adaptive capacities towards health and safety related disaster resilience in apparel industry in Sri Lanka. Also management and administration related information was not revealed up to a certain

extent due to the apparel factories internal rules & regulation. Collecting date from ground level employees were also had limitation due to high production pressure in all the facilities. Time limits were highly putting pressure to complete the research on time.

1.8 Structure of the research report

Structure of the research report is as follows.

- Chapter one, introduction includes the background of the study, introduction on the apparel industry in Sri Lanka, identification of the research problem, problem justification, research questions, research aim and objectives of the study and structure of the research report.
- Chapter two, literature review discusses about the available literature that is related to the adaptive capacities towards health and safety related disaster resilience in apparel industry in Sri Lanka.
- Chapter three, research methodology includes the research design, population and sample of the research, research measurement, hypotheses setting, conceptual framework and operationalization of each variable, data collection methods and data analysis techniques.
- Chapter four named as data presentation and data analysis which is presenting the sample structure and univariate, bivariate analysis of the primary data.
- Chapter five, conclusion and recommendation discusses about the findings of the study, conclusion and the recommendations for future improvements of the organization or industry and limitations of the research.

CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature on definition of disaster, disaster types, disaster resilience activities, adaptive capacities, disaster risk, garment industry in Sri Lanka and principal factors affecting to adaptive capacities towards health and safety related disaster resilience in apparel industry in Sri Lanka. This chapter also illustrates conceptual framework of the research and set the hypotheses of the study.

2.2 Definition of disaster

According to Shaw, Pulhin and Pereira (2010), disaster is sudden, extraordinary and un-accommodating occasion to individual, creature and plant. Furthermore, disaster can be natural because of common, and furthermore reason by methods for human development. Disaster causes by normal usually show on its own, for example, comprising of surge, tropical storm arrive slide and earthquake (Shaw and Hori, 2014). Other than that, disasters that reasons by the nature by and large can't be preventing from show up; in any case, individuals can essentially evade from end up being the casualty. As an example, at the season of earthquake, no individual knows about when it wants to show, yet while it happens, individuals can basically go to the protected region (Shaw, Pulhin and Pereira, 2010).

Disaster root by methods for the human is the fiasco incite by means of human including street touch of destiny, fighting and others that reason with the guide of the human itself. But that, the development of individual can cause the natural disaster (Zamecka and Buchanan, 2000). The change is continually exacting the deforestation and different games that can interchange the earth structure and solidness. Despite the fact that it nature disaster; in any case, it can be considered as human act disaster (Shaw and Hori, 2014).

Mitchell and Herrera (2011) guaranteed that disaster actually can reason the setbacks, financial downturn, absence of presence and homes and furthermore starvation. As indicated by Shaw and Hori (2014), effect of disaster is reasons through the mix hazard and weakness. Risk approach is the event that triggers the disaster comprehensive of quake. Other than defenselessness is the level of individuals uncover to the disaster. According to Shaw, Pulhin and Pereira (2010), there ought to

be the systematical way to deal with address the disaster all together that the impact from disaster can be decreases. Weight on disaster control is developed as additional acclaimed with the goal that individuals can reduce the effect (Seneviratne, Baldry and Pathirage, 2010).

2.3 Disaster Types

Disasters can take numerous extraordinary paper works and the length would variety be able to from hourly disturbance to days or maybe long stretches of continuous damage (Seneviratne, Baldry and Pathirage, 2010). Disasters are named per birthplace, into common and man-made debacles. Yet, such orders are more noteworthy instructional than real as essential disasters could truly be events that got gigantically more media protection (Hartman, 2007). Underneath is a rundown of the different styles of disappointments every regular and man-made or innovative in nature that can influence a system.

Table 2.1: Types of disaster (Shaw, Pulhin and Pereira, 2010)

Natural Disasters	Man Made Disasters
• Agricultural diseases & pests • Damaging Winds • Drought and water shortage • Earthquakes • Emergency diseases (pandemic influenza) • Extreme heat • Floods and flash floods • Hail • Hurricanes and tropical storms • Landslides & debris flow • Thunderstorms and lighting • Tornadoes • Tsunamis • Wildfire	• Hazardous materials • Power service disruption & blackout • Nuclear power plant and nuclear blast • Radiological emergencies • Chemical threat and biological weapons • Cyber attacks • Explosion • Civil unrest

• Winter and ice storms • Sinkholes	

2.3.1 Natural disasters

The meaning of natural disasters is any disastrous event that is a direct result of nature or the characteristic procedures of the earth (Haerens and Zott, 2013). Favor (2011) asserted that the seriousness of a disaster is estimated in lives lost, money related misfortune, and the capacity of the masses to remake. Exercises that emerge in uninhabited zones aren't considered screw ups (Newson and Chesi, 2002). Hence a surge on an uninhabited island would never again matter as a debacle; nonetheless, a surge in a populated place is known as a natural disaster (Brasch, 2011). Every natural disaster causes misfortune in a couple of conduct. Depending at the seriousness, lives can be lost in any amount of calamities. Falling homes or timber, solidifying to downfall, being washed away, or warmth stroke are just a portion of the savage outcomes (Healey, 2006). A couple of disasters ups cause more noteworthy loss of presence than others, and people thickness impacts the diminishing consider number pleasantly.

At that point there might be absence of benefits, which impacts individuals' living quarters, transportation, business, and intends to stay (Healey, 2006). Fields soaked in salt water after tidal waves take a long time to create plants again. Houses decimated by methods for floods, typhoons, twisters, landslides, a volcanic emission, or a earthquake are frequently past repair or set aside a significant number opportunity to wind up bearable yet again (Mitchell and Herrera, 2011). Non-open outcomes, memorabilia, vehicles, and records also take a win after numerous home grown screw ups. The normal disappointments that genuinely influence individuals worldwide tend to end up being more exceptional, on the grounds that the years go on. Recurrence of earthquakes, super storms, and warmth waves has long past up considerably inside the past couple of decades (Newson and Chesi, 2002).

Overwhelming populace in districts that get hit by utilizing surges, violent winds, and tropical storms has assumed that more prominent lives are lost (Seneviratne, Baldry and Pathirage, 2010). In a few districts, the populace has become fairly arranged for the consequence of screw ups and protects are worked for storms and tornadoes.

Therefore, absence of things keeps on being a problem, and anticipating numerous home grown disappointments isn't spotless (Shaw and Hori, 2014).

Researchers, geologists, and tropical storm watchers' canvases hard to expect most essential disappointments and maintain a strategic distance from as tons' harm as could be expected under the circumstances (Helmer and Hilhorst, 2006). With all the innovation to be had, it is turned out to be less convoluted to expecting vital tempests, snow squalls, violent winds, and distinctive climate related home grown disappointments (Healey, 2006). Therefore, there are in any case home grown disasters that emerge as a substitute all of sudden, comprising of tremors, out of control fires, avalanches, or perhaps volcanic eruptions (Newson and Chesi, 2002). In some cases, a period of caution is there; however, it is every now and again short with disaster results. Districts that are not used to disasters tormented by streak flods or sudden hail storms can be influenced in an outrageous way (Williams, 2000).

Therefore, regardless of the different characteristic disappointments the world over, humanity has demonstrated extraordinary relilience (Newson and Chesi, 2002). While a place or nation is dishonorably experiencing a natural disaster, the response is dependably positively one of attachment and help is brief to come (Shaw and Hori, 2014). There are organizations' establishments with the basic role of being sorted out for disastrous events (Brasch, 2011). Those organizations take a shot at worldwide and neighborhood scale protects canvases. As indicated by Seneviratne, Baldry and Pathirage (2010), the ones who've chosen to make disaster mitigation their reality work, while fiascos hit, the people advance in who help to make a refinement.

2.3.2 Man-made disasters

Helmer and Hilhorst (2006) unequivocal that man-made disasters are alluded to as anthropogenic disaster ups and they because of human basis, blunders or because of fizzled structures. As alluded to before, these are separated into a few classifications and there are a not many that reason more prominent said hurt while contrasted with others. An astonishing case is to inspect people made disasters including transportation (Butler, 1988). These are partitioned into novel classes which include aviation, rail, road and region among others. Frequently these are disregard or absence of information and throughout the years, they have guaranteed a few lives (Healey, 2012).

Some other sort of calamity that falls on this class is atomic bomb (Langley, 1986). At the point when this happens, it is a direct result of goal and the final products are much more prominent disasters with a gigantic percent of those included dropping their lives or as an elective winding up with fundamental deformities or long time wounds (Greenplanetethics.com, 2017). Diverse assortments of man-made disasters which can be basically as tragic include chemical spill, oil slick, fires and terrorism (Alcraft, 2000). Additionally, there are a couple of innovative dangers which incorporate power blackouts auxiliary disintegrate, business perils and fire. In cases of the end illustration, many kilometers of land can be annihilated and whatever else this is inside the wake of the fire heading (Maloney, 1976).

Throughout the years, fires have end up being known as widespread person made disasters and they are furthermore separated into exceptional classes comprising of hedge fires, mine, wild and firestorms (Koletar, 2011). One of the most extreme acclaimed man-made debacles inside the state of hearth turns into the Pennsylvania fire which was recorded in 1962 (Noji, 1997). It cleared out basic diversion afterward by decimating a city and to date, such flames keep to consume. Each time people experience mishaps, as a result of any of the alluded to man-made elements, the situation is additionally irritated if they don't get any quick social insurance (Wisner et al., 2002). Hence, it is mulled over vital to take break down more noteworthy about hearth readiness and the greatest consistent procedures to use to reduce causalities possibilities and exacerbation of the situation (Seneviratne, Baldry and Pathirage, 2010).

The amount of damage because of man-made disasters fluctuates essentially, and nation that others have considerably over the top charges when contrasted with others (Seneviratne, Baldry and Pathirage, 2010). This is principally bona fide while it comes directly down to reacting and convalescing. While individuals do a straightforward pursuit, they will discover a few sources that spotlight these charges and therefore, this could give them a clearer look at what hurt is caused by such events (Shaw, Pulhin and Pereira, 2010). In addition, there are different components which influence the costs together with region. For instance, if this is to emerge in thickly populated; be that as it may, in rich nations, the stop final product may end up being expansive (Hartman, 2007). In any case, if the equivalent has been to emerge in thickly populated; in any case, negative countries, the after effect costs would perhaps

end up being diminish and that is to a limited extent eagerly attached to scope (Mitchell and Herrera, 2011).

The loss of life because of man-influenced disasters to will even range as per land area and on this respect, the poorer countries are hardest hit while in contrast with the more extravagant ones (Shaw and Hori, 2014). That is ascribed to reality that the more extravagant countries have what it takes to react with pace to calls of trouble, and can uphold the best possible wellbeing measures wished through far flung control programming from a separation to deal with issues enough and quickly (Zamecka and Buchanan, 2000). Advanced age plays a totally critical component inside the way you react and get ready for screw ups (Shaw, Pulhin and Pereira, 2010). With money related support, it is direct to fulfill this quit. Then again, the poorer countries have no assets or property to react with. There are a few resources that completely feature the setbacks in such occurrences and it is extremely useful to examine the equivalent which will turn out to be more educated (Shaw, Pulhin and Pereira, 2010).

2.4 Disaster resilience activities

Resilience to disasters is characterized in writing in a few strategies. Gunaratna (2017) characterizes disaster flexibility as the capability of social units (e.g., offices, gatherings) to moderate risks, contain the outcomes of disappointments after they happen, and do recuperation sports in approaches that diminishing social disturbance and alleviate the consequences of future debacles. As indicated by Rodrgez, Quarantelli and Dynes (2009), resilience is the arrangement of preparing and reacting to the inevitable realization of the more than one and an expanding number of different dangers. Alcaantara-Ayala and Goudie (2014) characterize strength as an element showing the usefulness to maintain a phase of usefulness or execution for a given building, connect, help systems, or system, over a length depicted as the oversee time; this is ordinarily chosen by utilizing proprietors, or society.

The Multidisciplinary Center for Earthquake Engineering and Research (MCEER) at University of Buffalo has finished spearheading thinks about inside the earthquake engineering (Greenplanetethics.com, 2017). Tierney and Bruneau (2007), MCEER gives a structure to dissecting resilience of frameworks and networks construct absolutely in light of four parameters; Robustness, Redundancy, Resourcefulness and Rapidity (R4 Framework) (Jha and Stanton-Geddes, 2009). They are perceived four

measurements or spaces of resilience – Technical, Organizational, Social and Economical (TOSE). Rodrguez, Quarantelli and Dynes (2009) present a uniform wording for disaster resilience and its quantitative evaluation principally in view of dimensionless diagnostic abilities. The resilience system is as a general earthquake focused and expands upon MCEER's wording (Jha and Stanton-Geddes, 2009). The structure developed is done to an article of clothing producing office building and a piece of clothing business premises to center around the usage inconveniences. Easy apparels marketing campaign (2017) presents theoretical system to layout and degree seismic resilience of networks.

The significance to the proposed system is three reciprocal measures of flexibility 'diminished failure conceivable outcomes', 'diminished outcomes from disappointments' and 'decreased time to recovery'. Alcaantara-Ayala and Goudie (2014) watch the MCEER structure to form the seismic general execution of Los Angeles Department of Water and Power (LADWP) to investigate the frameworks' vigor and resilience essentially based at the records from Northridge earthquake. Guidelines of strength, fundamental foundation, help frameworks, association of framework and the R4 structure are clearly characterized by Deppisch (2017).

Environment, health and safety, fine and furthermore money related administration framework could be exceptionally imperative for an organization (Zamecka and Buchanan, 2000). In any case, individuals generally observe that monetary is situated at better nation and natural inconveniences and disasters at the lower level, if a progressive system of disaster management procedure in apparel business in Sri Lanka is draw. Notwithstanding, characteristic and man-made calamity administration in clothing manufacturing business and manufacturing process management system is playing a fundamental capacity in a Sri Lankan apparel region. In the event that money related control is managing the financial plan of a partnership, and great control is adapting to the charming of its items and methodologies, at that point it causes that disaster chance control is adapting to the ecological circumstances that the organization works in (Mitchell and Herrera, 2011).

2.5 Adaptive capacities

In looking to higher see how a business venture adjusts to natural requesting circumstances and openings, Miles and Snow (1978) propelled a typology that depicts

authoritative vital conduct (Matsuyama and Mori, 2011). This typology recognizes four conduct styles: protectors, prospectors, analyzers and reactors, depending on how a business venture reacts to the key issues, i.e. entrepreneurial, engineering, and authoritative issues. Lin, Moe and Pathranarakul (2006) expanded this model and presented another typology organization, in the state of vital gifts, general execution, and natural components to the valid four sorts of conduct. In an unexpected way, the model exhibited by utilizing Hrebiniak and Joyce is essentially in light of an interrelation between ecological determinism and the quantity of vital decisions or hierarchical responses (Alcantara-Ayala and Goudie, 2014).

Those components are crossed, they permit the advancement of a typology of authoritative versatility, whose collaborations realize the personality of four imperative types of adaptation: ‘herbal decision’, ‘differentiation’, ‘strategic want’ (which incorporates qualities of potential vision) and, eventually, ‘undifferentiated decision’ (Matsuyama and Mori, 2011). The exhibited styles call attention to that adaptive capability is unequivocally connected to the venture's vital movement with appreciates to changing over its aptitudes, assets and hierarchical capabilities. Consequently, it will meet the necessities of an evolving situation (Jha and Stanton-Geddes, 2009).

As indicated by Rodrguez, Quarantelli and Dynes (2009), it must be said that organizations are held people with the guide of their own directions; all together that they move toward becoming wards on their own key decisions with an end goal to affect their forefront and future aptitudes and authoritative procedures. On this, worldwide of relentless exchange, transforming into aggressive requires constant release and vital adaptability (Alcantara-Ayala and Goudie, 2014). Antique determinations in regards to the best approach to control hierarchical capacities should make the business a detainee of the past, in this way compelling future satisfaction (Lin, Moe and Pathranarakul, 2006). Particular organizations underneath the equivalent natural conditions can be driven, by outer strain, to wind up an expanding number of alike, consequently building up an obliging isomorphic framework inside the search for quality and institutional authenticity (Matsuyama and Mori, 2011).

According to Lin, Moe and Pathranarakul (2006), adaptive capability is mulled over to be the undertakin's key potential to hold focused advantage through changing, reconfiguring or interconnecting resources, abilities and skills, and looking for to expand the amount of choices or accessible vital responses. In this manner, it will adjust quick to determinism and ecological changes.

2.6 Disaster risk

Disasters are once in a while thought about outer shocks; in any case, disaster results from the mind boggling interchange among change forms that produce circumstances of attention, powerlessness and possibility (Wisner, 2015). Along these lines, catastrophe chance is thought about, in light of the fact that the total of the seriousness and recurrence of a peril, the quantities of people and property presented to the danger, and their powerlessness to hurt (Lin, Moe and Pathranarakul, 2006). Inside and out peril is disaster risk identified with low-likelihood, unreasonable impact exercises, while tremendous hazard is related with over the top possibility, low-impact occasions (Shaw, Pulhin and Pereira, 2010).

The misfortunes and effects that describe disappointments by and large have a lot to do with the reputation and defenselessness of people and places as they do with the seriousness of the hazard event (Shaw, Pulhin and Pereira, 2010).

Disaster risk has numerous qualities (Wisner, 2015), which will comprehend calamity hazard in clothing industry; it is urgent to remember that it is extensively:

- **Forward looking:** The probability of death toll, annihilation and harm in a given timeframe.
- **Dynamic:** It can increment or reduction as per our capacity to decrease powerlessness.
- **Invisible:** It is included the danger of high-affect occasions, as well as the incessant, low-affect occasions that are regularly covered up.
- **Unevenly conveyed around the earth:** Hazards influence diverse territories; however, the example of calamity chance mirrors the social development of introduction and weakness in various nations.

- **Emergent and complex:** Many procedures, including environmental change and globalized financial advancement, are making new, interconnected dangers.

The essential of understanding disaster possibility is by utilizing perceiving that disappointments are a trademark of change disasters, implying that disaster possibility is a measure of the maintainability of enhancement (Shaw, Pulhin and Pereira, 2010). Hazard, powerlessness and exposure are enlivened by utilizing some of threat drivers, including destitution and imbalance, severely arranged and oversaw city and provincial improvement, climate trade and ecological debasement (Baker, 2012).

Information disaster risk calls for us to never again best remember the risk; exposure and weakness additionally society's ability to shield itself from disasters (Alcantara-Ayala and Goudie, 2014). The capacity of networks, social orders and structures are to look up to, drench up, suit, recoup from disappointments, while at the indistinguishable time improve prosperity, is alluded to as resilience (Shaw, Pulhin and Pereira, 2010).

2.7 Garment industry in Sri Lanka

The clothing industry in Sri Lanka wind up created inside the 1960s and especially engaged at the home-developed commercial center. The fare introduction of arranged made array producing began in the 1970s (Silva, 2011). It ended up cutting edge startlingly after 1977 from the coming of Open Financial Policy which advanced assembling for the fare showcase. The experts upheld sending out through the different motivating force programs which incorporates appropriations and obligation discount plans, diminish organization charges, assess excursions and obligation loosened imports of gear and uncooked texture (Dharmasiri and Ranasinghe, 2015). Likewise, free trade zones had been introduced around the nation.

The harbor moved toward becoming overhauled with required framework offices. Keeping money offices and a couple of various warning contributions were provided by method for the experts to offer fares. The Board of Investment (BOI) was set up basically with the perspective of giving warning contributions to exporters (Dharmasiri and Ranasinghe, 2015). In 2002, the Sri Lankan piece of clothing undertaking's commitment to Gross Domestic Product (GDP) achieved 60% and to

that of mechanical creation more than 39%. Inside the past due Eighties tea turned into the essential fare and represented 48.5% of general fares (Dharmasiri and Ranasinghe, 2015). In 1990, it boiled down to 26%. All through the length of 1980-1990, the commitment to GDP of pieces of clothing quickened from 3.6% to 32.8 which propose the fast development of the garment industry (Silva, 2012).

In the early years of the clothing market, Foreign Direct Investments (FDI) turned into the essential wellspring of financing capital; however, household capital at long last played a basic capacity in the endeavor's advancement (Silva, 2011). With the appearance of the Multi Fiber Agreement (MFA) in 1974, a quantity showcase for arrived in to task (Silva, Perera and Samarasinghe, 2011). The share gadget anchored remote markets inside the America, Europe and Canada for Sri Lanka. East Asian global areas including Korea, Taiwan and Hong Kong were pulled in, in light of the fact that their quantities in those abroad markets effectively connected though Sri Lanka had unexhausted shares by means of that time (Silva, Perera and Samarasinghe, 2011). This turns into an empowering part for Taiwan, Hong Kong and Korea to put resources into Sri Lankan Garment business. The phenomenally proficient and without issues trainable gathering of laborers turned into something else to the remote financial specialists to enter Sri Lankan piece of clothing venture (Silva, 2012). Later on the scope of adjacent foundations enhanced with the assistance of government motivation applications (Dharmasiri and Ranasinghe, 2015).

2.8 Health and Safety

Employee health and safety projects ought to be a noteworthy need for administration since they safe lives, increment efficiency, and diminish costs. These wellbeing and security programs should pressure representative association, kept checking, and a general health part (Anthony et al., 2007). Job security requires that sheltered working conditions ought not to make huge danger of individuals being rendered unfit to play out their work.

Wellbeing and security at work is along these lines went for making conditions, capacities, and propensities that empower the laborer and his/her working place to complete their work effectively and in a way that maintains a strategic distance from occasions which could cause them hurt (Garcia-Herrero et al., 2012). Obviously sheltered working conditions affect the propensities for laborers, which thusly impacts

on proficiency. This infers representatives working in a safe condition are probably going to perform in a way that won't cause them hurt (Jonathan and Mbogo, 2016).

When looking at two kinds of models on wellbeing, Robens (1972) offers a test to the conventional way to deal with security in the work environment, known as the ‘irresponsible employee’ model. In this model, bosses expected that the majority of the mischances were because of the representative's inability to consider security important, or neglecting to ensure themselves. In his report, he perceived that the 'reckless specialist' display does not clarify word related sick wellbeing caused by poisonous substances, commotion and severely composed and hazardous frameworks of work. Another way to deal with word related wellbeing and security, the 'mutual duty' show accept that the most ideal approach to diminish levels of word related mishaps and illness depends on the participation of the organization and workers (Bratton and Gold, 1999).

Therefore, to keep up a sheltered and solid work place, laborers and supervisors must be educated to keep a wellbeing and security mentality. Such knowledge does not generally go with the obtaining of aptitude or information on gear task. A state of mind of development is in any case, fundamental. In spite of the fact that businesses are required to plan and keep up sheltered and sound frameworks of work, the corresponding obligation of the representative is to carry on in a way that protects his or her own health and that of his/her associates (Bratton and Gold, 1999).

2.9 Principal factors affecting to adaptive capacities towards health and safety related disaster resilience in apparel industry in Sri Lanka

2.9.1 Health & safety awareness and training

In excess of 200 people are executed each year at work and in excess of one million people are hurt. In excess of two million persist disorders are caused by or exacerbated by their work. Organizations in clothing industry meet legal duties to give prosperity and security information to guarantee masters is through planning. A current ponder review by the Institute for Work and Health (IWH) shut workplace getting ready and guideline emphatically influences the wellbeing and security practices of workers (Zamecka and Buchanan, 2000).

There was insufficient confirmation that readiness in solitude reduced harm rates. These revelations support the multi-faceted approach set out in the recommendations of the panel: filling holes in getting ready requirements, propelling key parts of OHS execution, for instance, organization obligation, enabling master collaboration, influencing societal guidelines, and making systems to recognize and remove hazards. To make tremendous upgrades to workplace prosperity and security, these parts are basic.

A standard ought to be created to set up a wellbeing and security mindfulness preparing program for all workers. It ought to be a need that authorities get this information at the segment level, going before being exhibited to workplace dangers. The substance for such a standard exists inside gigantic quantities of the ventures that prosperity and security affiliations have made and inside the undertakings of various organizations in attire industry. Work and business accomplices should be advised in the progression of this standard and regarding the substance of a specific preparing program.

2.9.2 Implementation of preventive safety systems

Prevention implies that the demonstration or routine with regards to preventing something awful from happening. In the sentiment of OSH, it suggests the avoiding of the risk or threat at work. Rather than repugnance, control is the term to depict lightening practices where the danger can't be deflected. The principles of evasion and control techniques are treasured in a couple of bits of EU Health and Safety (H&S) order in attire industry. The OSH Framework Directive is of real centrality; it is principal H&S law in the country which sets down general principles concerning repugnance and security of pros against word related accidents in clothing industry and infection and sets up the framework for prosperity and prosperity organization at the workplace.

The thoughts of hazard assessment and hazard organization are fundamental to balancing activity and control of risks to prosperity, and prosperity in the workplace. The key parts of peril study join guaranteeing each pertinent danger are considered, checking the capability of the prosperity measures got, detailing the consequences of the assessment and investigating the assessment as often as possible to keep it revived. Specialists in clothing industry have a benefit to diminishing in wiped out

prosperity and accidents given that these things can be foreseen or diminished if risk appraisal and risk management are done.

The ILO perform fuses the establishment for the necessity for an safety culture including that the degree of the overall impact of word-related incidents in apparel industry and diseases, and also major mechanical debacles, to the extent human persevering and related budgetary costs, have been a long standing wellspring of stress at workplace, national and worldwide levels. Gigantic undertakings have been made at all levels to manage this issue; notwithstanding, by the ILO surveyed in 2003 that in excess of 200 experts in pass on consistently from business related accidents in apparel industry.

2.9.3 Emergency preparedness

Disasters are man-made crisis or related events which have negative money related and social results for the affected masses in garments industry. The general welfare of individuals when all is said in done is incapacitated, defending government intervention to restrict the unfavorable effects of any disaster (Thiele-Cirka, 2008). At issue is how much the piece of good commitment by particular nationals should play in a disaster management in apparel industry.

Starting at now, there are no less than thirteen organization and divisions all through the Sri Lankan government that give disaster mitigation programs, with the Small Business Association (SBA) and the best provider of non-provincial help to particular nationals that related to attire industry. Upon a fiasco affirmation by the president or SBA head, the SBA gives low-interest credits to catastrophe setbacks to repair or supplant land or individual property with repayment terms of up to thirty years (Silva, 2012).

Government programs utilize resident dollars to help disaster losses, spreading setback all through all subjects, while safety passes on hardship transversely finished only the pool of impacted purchasers. Neither one of the out risk yet, rather circles the heaviness of adversity over greater masses. Therefore, current government system on disaster assist appears with remunerating brave individuals and rebuke chance averters (Shaw, Pulhin and Pereira, 2010).

2.9.4 Safety culture

Safety culture is the perspective, feelings, observations and characteristics that agents share in association with security in the workplace. It is a bit of definitive culture, and

has been delineated by the articulation ‘the way we complete things around here’. Relatively every workplace has security culture issues. In light of current conditions workplace social orders grow slowly and can be killed quickly (Mearns et al., 2010). Four components can cause particular burden for prosperity social orders and provoke negative miens towards security and extended assurance from safety measures in clothing industry in Sri Lanka.

Consistently, an impressive measure of thought has focused on the explanations behind word related scenes in garments industry in Sri Lanka. Exactly when events occur in the workplace, it is fundamental to understand what factors (human, specific, various leveled) may have added to the outcome in order to avoid practically identical scenes later on. Through working up a perception of why and how events happen, fitting methodologies for scene neutralizing activity can be delivered (Noji, 1997).

Already, change in workplace prosperity or in the control of workplace perils in attire industry in Sri Lanka has happened as expected through the game plan of more secure contraption or methodology, the better getting ready of delegates, and the introduction of formal prosperity organization structures. In this manner, workplace that has benefitted from these overhauls, countless staying working condition incidents result from executive misstep - no less than one overseers finishing an occupation exceptionally as opposed to the protected way they were set up to.

Therefore, there is by and by a move to apply the possibility of safety culture at the individual level; worker direct is affected by the prosperity society of an apparel industry affiliation. Therefore, safety culture could impact the authority harm rate. Regardless of the way that the general culture of an affiliation may impact the direct of specialists, much research has focused on the effect of more bound components (i.e. managers, interpretation of security techniques) in the specific culture of individual workplaces, provoking the possibility of an ‘adjacent prosperity air, which is all the more unprotected to advance and change’.

This would moreover suggest that safety environment deals with an unforeseen level in contrast with prosperity society. Mearns et al. (2010) observe that notwithstanding the way that prosperity society was a thought at first used to depict the deficiencies of security organization that result in noteworthy catastrophes in clothing industry, that the thought is by and by being associated with illuminate setbacks at the individual

level, in spite of the way that as they underscore, the authenticity of the security culture thought concerning particular accidents is yet to be found.

2.9.5 Involvement of HSE professionals

Health and safety professionals have a pledge to the consolation of labours' engagement in health and security issues, in light of confirmation recommending that this prompts a bringing down of sick-health and irate of injuries to the labours at work. Therefore, there is a goal to implant compelling risk management in ordinary hierarchical practices.

The standard health and safety issues at stores and warehouses are perils related with moving and putting away stock in store yards and inside, dangers related with fork-lift truck activity, and those subsequent from oppressive or savage clients. The HSE professionals have rule obligation regarding store-level everyday consistence with the health and safety management systems which are set out in the factory manager's log book. The garment factories additionally hold a month to month health and safety committee, including delegates from every department, which talks about the usage of corporate demands and surveys nearby health and safety issues. This is done through conference and exchange ideas, critical thinking and issue determination.

Each store also holds a monthly health and safety committee, involving representatives from each department, which discusses the implementation of corporate requests and reviews local health and safety issues. This is done through consultation and dialogue, problem-solving and issue resolution.

2.10 Conceptual Framework

Quinlan et al. (2015) clarify conceptual framework by "a hypothetical premise that characterizes the methods of insight conceived how characterize sensations or factors or ideas that are identified with each other and the clarification of these factors proceed related by for each other or a theory". Figure 2.1 demonstrates the conceptual framework which is produced by the researcher.

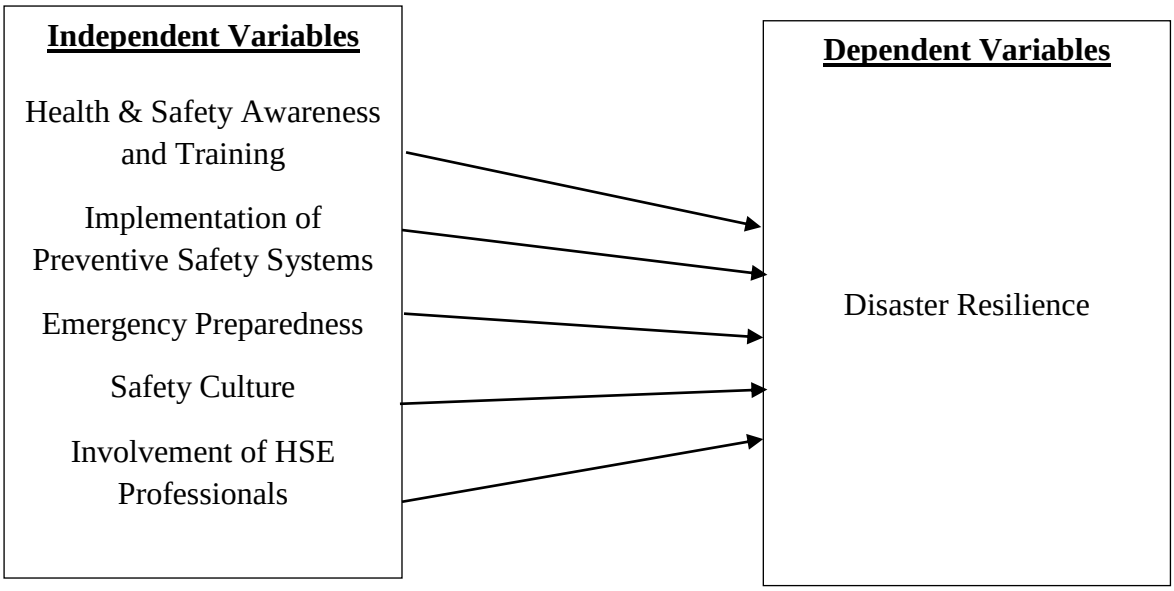

Figure 2.1: Conceptual Framework

2.11 Hypotheses

H_1: There is a positive relationship between health & safety awareness and training, and health and safety related disaster resilience.

H_0: There is no relationship between health & safety awareness and training, and health and safety related disaster resilience.

H_2: There is a positive relationship between implementation of preventive safety systems, and health and safety related disaster resilience.

H_0: There is no relationship between implementation of preventive safety systems, and health and safety related disaster resilience.

H_3: There is a positive relationship between emergency preparedness, and health and safety related disaster resilience.

H_0: There is no relationship between emergency preparedness, and health and safety related disaster resilience.

H_4: There is a positive relationship between safety culture, and health and safety related disaster resilience.

H_0: There is no relationship between safety culture, and health and safety related disaster resilience.

H_5: There is a positive relationship between involvement of HSE professionals, and health and safety related disaster resilience.

H_0: There is no relationship between involvement of HSE professionals, and health and safety related disaster resilience.

2.12 Chapter summary

This chapter has audit of important writing of adaptive capacities towards health and safety related disaster resilience in garments industry in Sri Lanka. Ascending from the survey, different inquired about theories are introduced. Accordingly, it is vital in the interest of this research to give wide industry related theories to this section. Studies around there will offer new mindfulness on the degree to which these theories stand applicable to the businesses and industry.

CHAPTER 3 - RESEARCH METHODOLOGY

3.1 Introduction

The researcher discusses about the subject; adaptive capacities towards health and safety related disaster resilience in apparel industry in Sri Lanka by the use of related theoretical concepts. This chapter's main aim is to study about the research methodology used in this study. It is mainly comprises population and sample, data collection methods and data analyzing techniques, validity and ethical considerations of the study.

3.2 Research and Research Methodology

According to Quinlan et al. (2015), the researcher's key point is an endeavor to perceive the study gap and satisfy that gap through coordinating a study. After that study gathers, data connected to that picked concern and dissect them basically to settle on a choice focused on the real sign. According to Ketchen and Bergh (2007), a research is a delicate and precise method for comprehending hazardous circumstances.

Kotler all around characterized the extent of research technique by when learn about research system, not just investigation of research strategies. Therefore, it mirrors the levelheaded; behind the examination strategies use out of sight of the exploration consider investigation in present circumstance (Sachdeva, 2009). At that point spellbinding by consuming a particular strategies or systems and for what reason not exhausting others, with the goal that review results are capable assessed, and besides finished the analyst himself or through others. Research technique characterizes methodological and orderly strategy which can keep on reaching at the result or results of a research.

3.3 Operationalization

Operationalization of idea includes lessening of dynamic ideas and changing over them in to quantifiable reaction by doling out scores by reactions with the utilization of a level of estimation or pre-characterized scale (Fisher, 2006). Singular reactions are normally in view of their recognitions, dispositions and sentiments, which are not

evidently quantifiable. Along these lines, it is fundamental to separate individual reactions on the factors with changing level of modernity (Ketchen and Bergh, 2007).

The accompanying table outlines the measurements of factors and the speaking to question numbers from the survey which is utilized as a part of this study.

Table 3.1: Operationalization

Concept	**Variables**	**Representing Question No. in the Questionnaire**
Independent variables	Health & safety awareness and training	1, 2, 3
	Implementation of preventive safety systems	4, 5, 6
	Emergency preparedness	7, 8, 9
	Safety culture	10, 11, 12
	Involvement of HSE professionals	13, 14, 15
Dependent variable	Health and safety related disaster resilience	16, 17, 18

3.4 Research design

Research is arranged in quantitative method which is set on positivistic model (Ketchen and Bergh, 2007). Review systems proceeded with the central instrument misused to look at that. Through and through the related proof would gather in a sorted out and arranged technique to extend at a fitting suspicion (Borrett, Sampson and Cavoukian, 2016). Information may be examined fittingly to advancement the conclusion. Research configuration ensures the primary parts, purpose of the research, research strategy, research approach and time horizon.

3.4.1 Purpose of the Study

Various gatherings of studies could happen in this field. Exploratory in condition or graphic, coordinated to test speculation proceed with a portion of the research bunches as indicated by Mitchell and Jolley (2013). Study of related investigations earlier finished in the comparative foundations can be perceived as an imperative

method of settling normal troubles, and it is perceived as contextual analyses. It can be utilized by method for an information maker on the tricky zone. Information about research subject is the primary factor which resolutions whether it would be exploratory, clear or theory testing condition (Borrett, Sampson and Cavoukian, 2016).

Exploratory way of studies target new degrees of bsiness research (Ketchen and Bergh, 2007). Descriptive investigations are mainly recognize about the highlights of a gathering of respondents (Quinlan et al., 2015), while accomplishment information about the sorts of gatherings that take after some shared accomplishes and speculation troublesome push to examine whether or else not the esteemed relationship devour is confirmed and a reaction to explore question takes (Sachdeva, 2009).

As indicated by the above legitimization, the aim behind this study can be expressed as exploratory.

3.4.2 Research Approach

Deductive and inductive is the two key research approaches. Moving at that point correct clarifications to included disentanglements and rationalities are inductive strategy and it is thinking workings the additional procedure (Ketchen and Bergh, 2007). Bottom-Up technique is an additional assignment on this type of approach (Maxwell, 2013). Theory and approach sees industrialized situated on the legitimizations. Work in an additional regular path to the specific methods of insight sees acknowledged by method for deductive approach. Top-Down technique is further appearance depleted to distinguish this kind of approach. Perception sees perceived put on the rationalities and theory. Deductive approach is depleted to this investigation; since ponder expects to endorse the choice by the care of ideas and speculations (Borrett, Sampson and Cavoukian, 2016).

3.4.3 Research Strategy

Investigating the exploration issue is proceeded through the philosophy named look into procedure. As indicated by Dagnino (2014), answering exploration inquiries efficiently sees supported through research procedure. Technique utilized as a part of this assessment is refined by the care of survey (Mitchell and Jolley, 2013). Strategy

is to proceed with spread between to each person who chose in the research (Maxwell, 2013).

The upside of retentive this particular research strategy is the capacity to gather answers since enormous measure of respondents in a cost-effective and time successful way, ability to estimate the answers quantitatively and hone that confirmation to technique new ideas in the field. Along these lines backings to assess analyze research data accurately (Borrett, Sampson and Cavoukian, 2016).

3.4.4 Time horizon

It is essential to reflect around time horizon; however, coordinating an investigation. Cross sectional or established is the double classifications of time plan. As indicated by Mitchell and Jolley (2013), if researcher is to gather through and through the information associated with the perusing at one time, it is reasonable to bearing a cross-sectional perusing. Longitudinal assessment is to see expected, when the specialist takes to gather information included than one time. This examination is composed in a cross-sectional technique. Since in general the proof takings in the past gathered or else single portrayal figures are utilized to answer by and large the research questions.

3.5 Sampling Design

3.5.1 Population

The population was all medium & large size of factories in free trade zone in Sri Lanka.

3.5.2 Sample Selection Procedure

In here, the purposive sampling method was used to select 50 garment manufacturing factories from population of all medium & large size of factories in free trade zone in Sri Lanka as the selected sample.

3.5.3 Sample Size

Sample of 50 garment manufacturing factories were selected from a population of medium & large size of factories in free trade zone in Sri Lanka.

3.6 Data Collection Methods

Data collection methods are to gather data to comprehend the essential plans with respect to a troublesome (Weller and Romney, 1998). For instance, Quinlan et al. (2015) assigned that questionnaires and studies proceed with two data gathering procedures. Borrett, Sampson and Cavoukian (2016) expressed that essential investigation is fixated on logical strategies, methods of insight and rationalities. There are two data collection methods.

The researcher was practiced closed-ended questionnaires as one of the primary data collection technique. There were 50 factories responded out 56 contacted. Also the researcher was collected data through structured audits reports which were conducted as part of social compliance and health and safety audits of worldwide responsible accredited production (WRAP) which includes one to one interview with respective responsible person for health and safety of 50 factories.

In addition, Ketchen and Bergh (2007) recognize that secondary study contains studying present figures. Therefore, the researcher was used associate studied journal articles, annual reports and printed books as the secondary data collection methods.

3.7 Data Analyzing Techniques

The self-regulated, organized survey was utilized to gather data from selected 50 factories in this investigation. The information was gathered through the clear investigation, and after that it was organized in SPSS Software for statistical analysis (Maxwell, 2013).

Descriptive statistics were utilized to comprehend the qualities of the dependent factor and the independent factors in this study (Mitchell and Jolley, 2013). Correlations of coefficient analysis were utilized to comprehend the relationship between the independent factors and dependent factor (Fisher, 2006).

At last, multiple regression study which is a factual procedure for assessing the connections among factors will be utilized in this investigation keeping in mind the end goal to gauge the model legitimacy (Launer, 1982). It includes numerous strategies for displaying and breaking down a few factors, when the point of convergence is on the connection between a dependent factor and independent factors.

Also multiple regression analysis helps to perceive how the average estimation of the needy variable modifies when the independent factors are differed (Ramsay and Silverman, 2010).

3.8 Validity & Reliability of the Research

Validity means the sum to which an application apportioning whatever it is thought to sum and a processing instrument sees powerful while it ensures whatever is wanted to compose (Cuervo-Cazurra et al., 2017). Research validity can proceed assessed over different methods such by method for contended validity, standard linked validity and build validity (Ketchen and Bergh, 2007). The survey offers a sophisticated introduction through exhibiting a palatable measure of substances that imply factors of consideration assurance the content validity of the study (Dagnino, 2014).

An evaluating application is mindful in the event that it consistently edits alike outcomes at tedious administrations. Accordingly, the survey of this research guaranteed to proceed with confirmed to acknowledge whether it trims alike significances in repetitive administrations. Reliability signifies to a sum's consistent quality or else unfaltering quality across period (Borrett, Sampson and Cavoukian, 2016). It is how sparkling the application relentlessly and solidly sum at all the origination it figures (Dagnino, 2014).

3.9 Ethical Approach to Research

Ethical approach of this research is proceeded with productively settled by arranged through Maxwell (2013) as specified in the underneath.

Answer to assents of research sample is accomplished before engaging them in the study. Enrollments of the selected 50 garment factories take not presented to control into some strategies. Secrecy of the research sample’s returns proceeded with suggested. Selected 50 garment factories of the research are proceeded with told about targets and objective of the research past to essential data collection methods.

CHAPTER 4 - DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter illustrates the presentation and analysis of data. This chapter includes the frequency analysis for individual questions, Cronbach's alpha reliability analysis, descriptive statistics, correlation analysis, multiple regression analysis and hypotheses validation.

4.2 Frequency Analysis for Individual Questions

Frequency analysis was done to analyze the individuals' data frequencies for the questions for each variable separately. Pie charts were illustrated with frequency percentage values.

4.2.1 Health & Safety Awareness and Training

1. The garment is providing an applicable training on health and safety procedures for new employees.

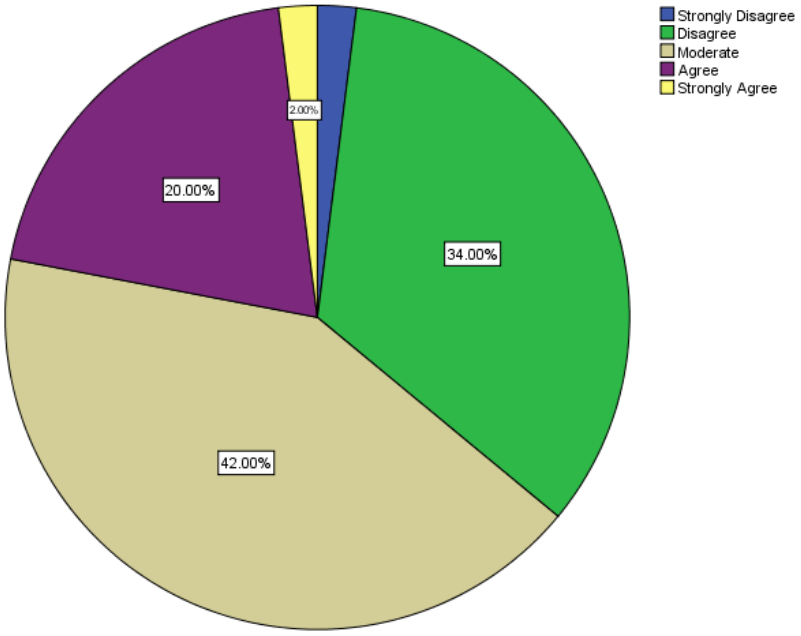

Figure 4.1: Health & Safety Awareness and Training - 1

Table 4.1: Health & Safety Awareness and Training - 1

	Frequency	Percent
Strongly Disagree	1	2.0
Disagree	17	34.0
Moderate	21	42.0

Agree	10	20.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.1 and Table 4.1, 22% of respondents were agreed that the garment is providing an applicable training on health and safety procedures for new employees, while 42% of respondents were given moderate responses and 36% of respondents were disagreed on the above statement.

2. The garment periodically evaluates and updates its safety policies and procedures.

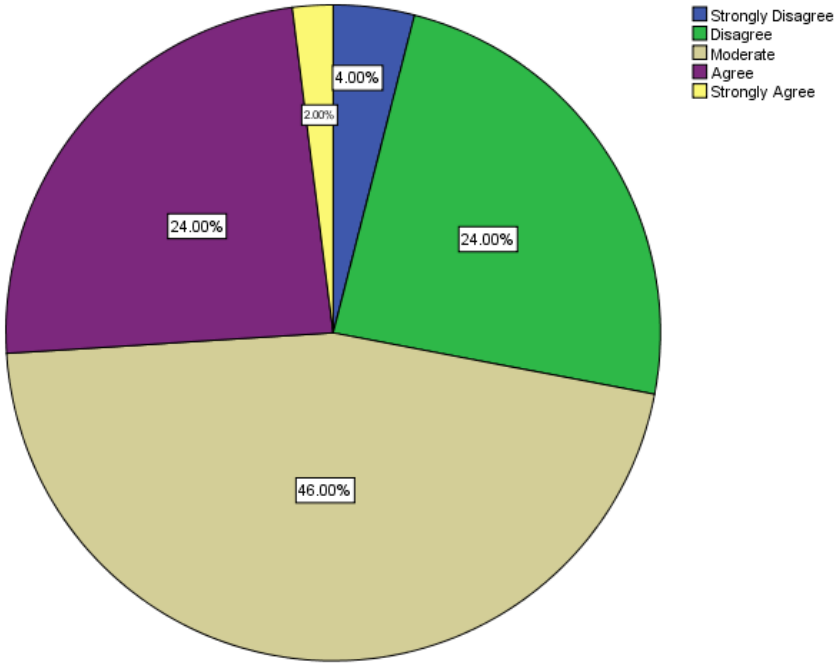

Figure 4.2: Health & Safety Awareness and Training - 2

Table 4.2: Health & Safety Awareness and Training - 2

	Frequency	Percent
Strongly Disagree	2	4.0
Disagree	12	24.0
Moderate	23	46.0
Agree	12	24.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.2 and Table 4.2, 26% of respondents were agreed that the garment periodically evaluates and updates its safety policies and procedures, while 46% of respondents were given moderate responses and 28% of respondents were disagreed on the above statement.

3. There are dedicated full time health and safety staff who manage the program.

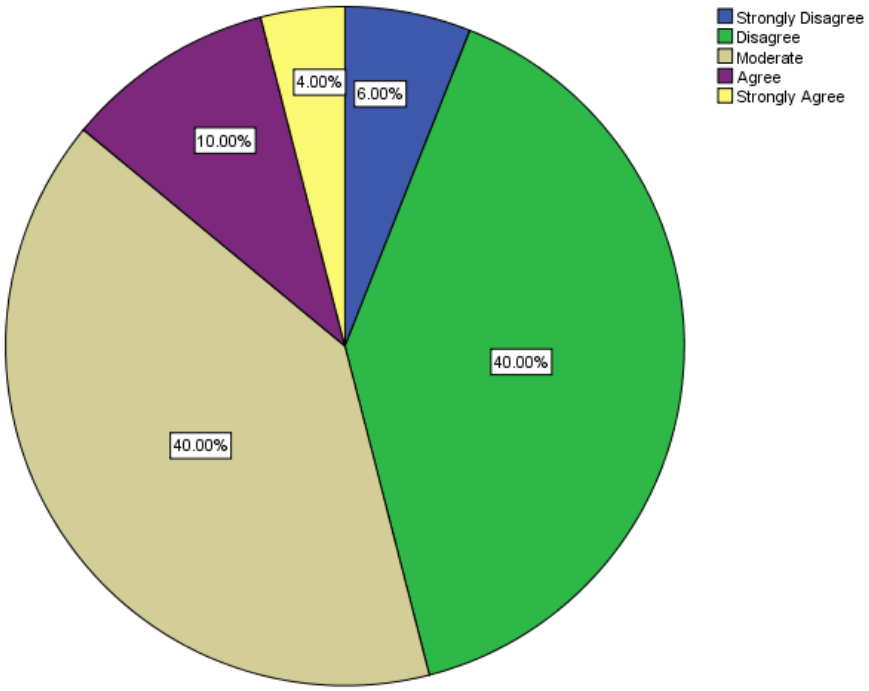

Figure 4.3: Health & Safety Awareness and Training - 3

Table 4.3: Health & Safety Awareness and Training - 3

	Frequency	Percent
Strongly Disagree	3	6.0
Disagree	20	40.0
Moderate	20	40.0
Agree	5	10.0
Strongly Agree	2	4.0
Total	50	100.0

As shown in Figure 4.3 and Table 4.3, 14% of respondents were agreed that there are dedicated full time health and safety staff who manages the program, while 40% of respondents were given moderate responses and 46% of respondents were disagreed on the above statement.

4.2.2 Implementation of Preventive Safety Systems

1. The company has a safety and health management system that assigns roles and responsibilities to all employees and management.

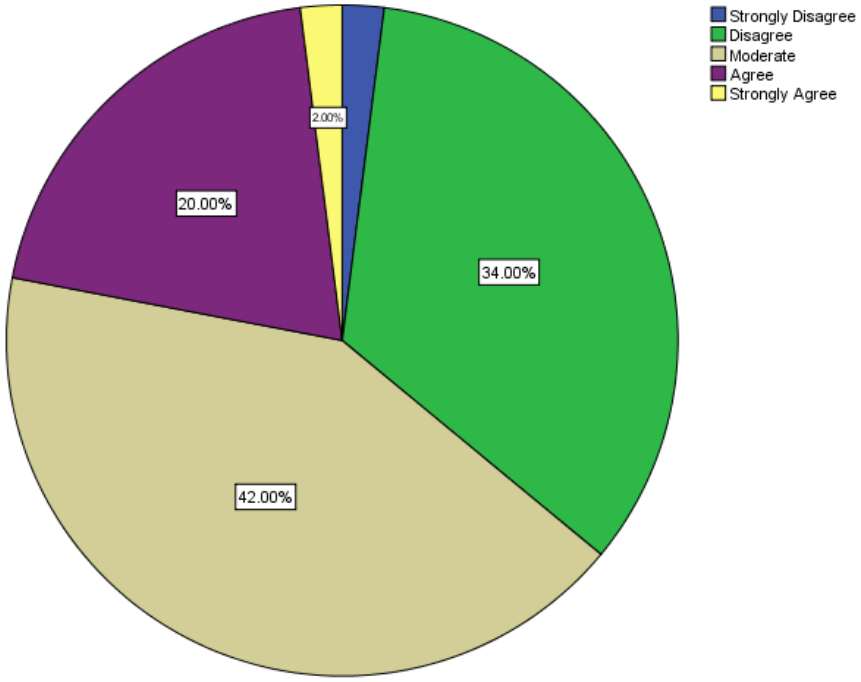

Figure 4.4: Implementation of Preventive Safety Systems - 1

Table 4.4: Implementation of Preventive Safety Systems - 1

	Frequency	Percent
Strongly Disagree	1	2.0
Disagree	17	34.0
Moderate	21	42.0
Agree	10	20.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.4 and Table 4.4, 22% of respondents were agreed that the company has a safety and health management system that assigns roles and responsibilities to all employees and management, while 42% of respondents were given moderate responses and 36% of respondents were disagreed on the above statement.

2. Safety signs are visible for everyone to see in the company.

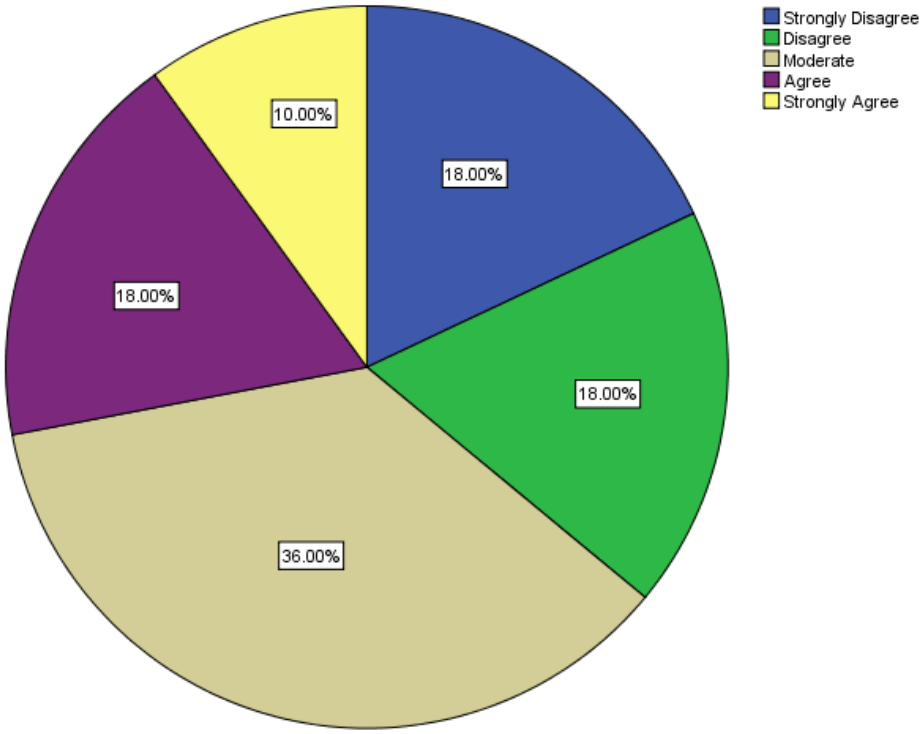

Figure 4.5: Implementation of Preventive Safety Systems - 2

Table 4.5: Implementation of Preventive Safety Systems - 2

	Frequency	Percent
Strongly Disagree	9	18.0
Disagree	9	18.0
Moderate	18	36.0
Agree	9	18.0
Strongly Agree	5	10.0
Total	50	100.0

As shown in Figure 4.5 and Table 4.5, 28% of respondents were agreed that safety signs are visible for everyone to see in the company, while 36% of respondents were given moderate responses and 36% of respondents were disagreed on the above statement.

3. Health and safety warnings provided to the suppliers if the materials are defect.

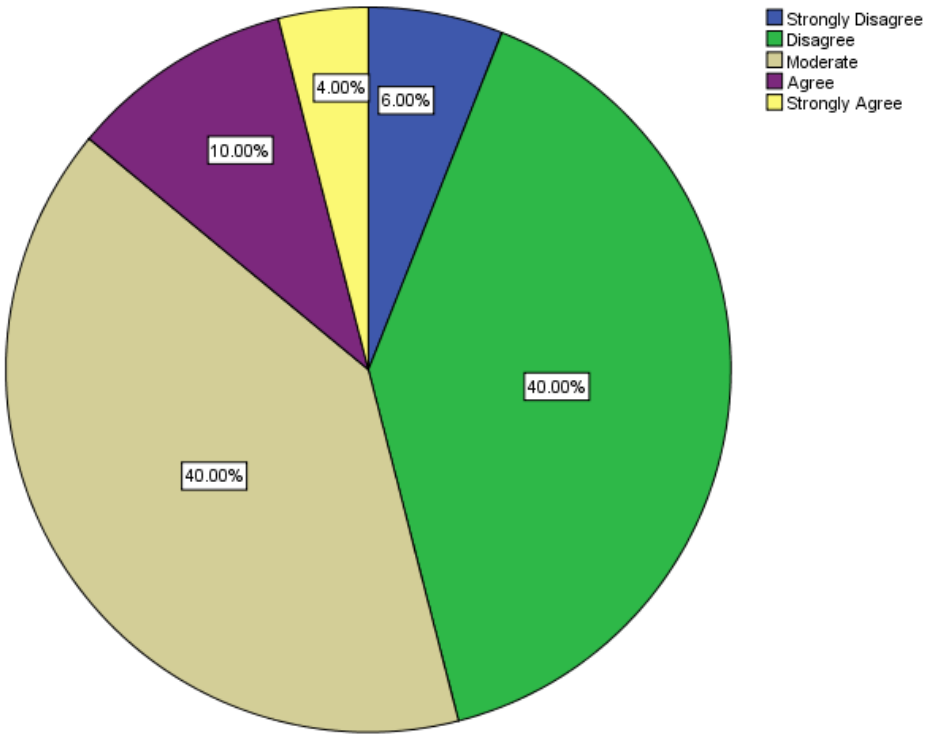

Figure 4.6: Implementation of Preventive Safety Systems - 3

Table 4.6: Implementation of Preventive Safety Systems - 3

	Frequency	Percent
Strongly Disagree	3	6.0
Disagree	20	40.0
Moderate	20	40.0
Agree	5	10.0
Strongly Agree	2	4.0
Total	50	100.0

As shown in Figure 4.6 and Table 4.6, 14% of respondents were agreed that health and safety warnings provided to the suppliers if the materials are defect, while 40% of respondents were given moderate responses and 46% of respondents were disagreed on the above statement.

4.2.3 Emergency Preparedness

1. Regular maintenance is important factor for effective emergency management.

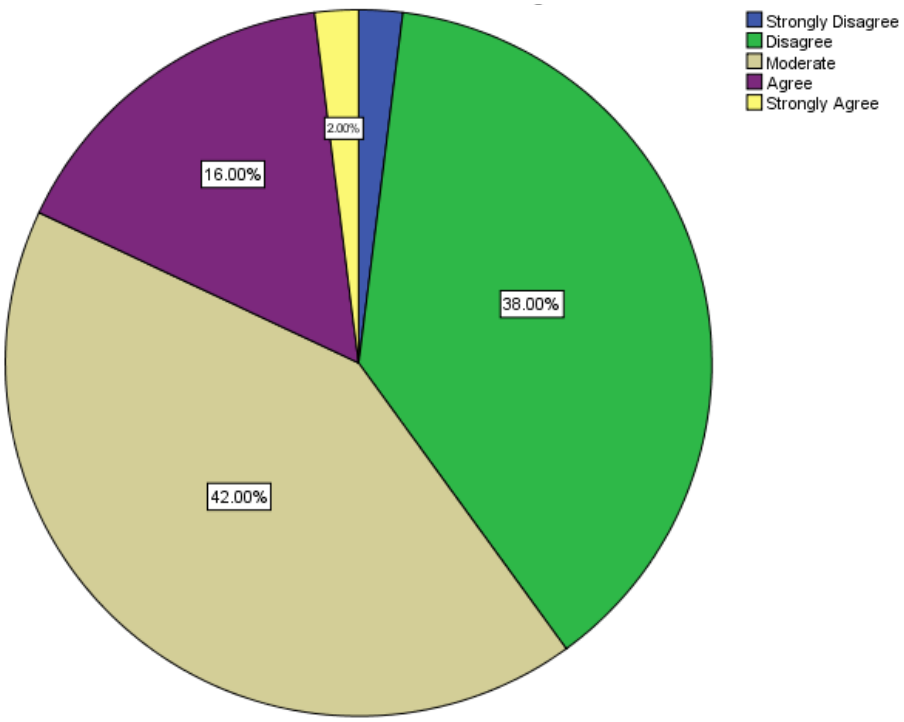

Figure 4.7: Emergency Preparedness - 1

Table 4.7: Emergency Preparedness - 1

	Frequency	Percent
Strongly Disagree	1	2.0
Disagree	19	38.0
Moderate	21	42.0
Agree	8	16.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.7 and Table 4.7, 18% of respondents were agreed that regular maintenance is important factor for effective emergency management, while 42% of respondents were given moderate responses and 40% of respondents were disagreed on the above statement.

2. Inspectors impose fines and penalties when the employer is non-compliant.

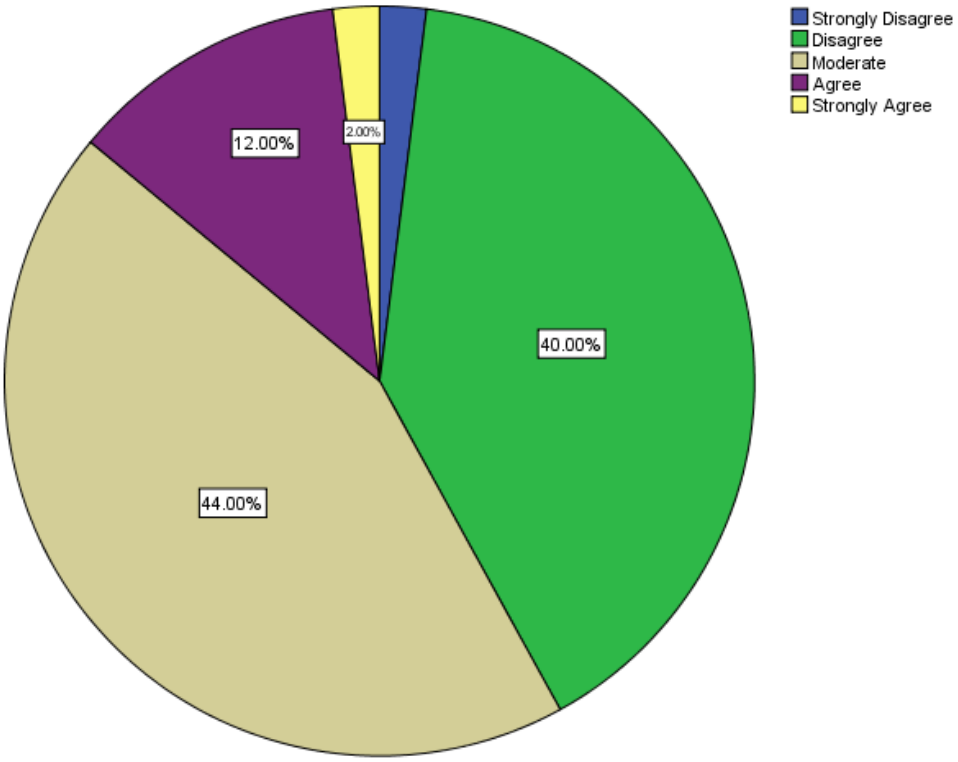

Figure 4.8: Emergency Preparedness - 2

Table 4.8: Emergency Preparedness - 2

	Frequency	Percent
Strongly Disagree	1	2.0
Disagree	20	40.0
Moderate	22	44.0
Agree	6	12.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.8 and Table 4.8, 14% of respondents were agreed that inspectors impose fines and penalties when the employer is non-compliant, while 44% of respondents were given moderate responses and 42% of respondents were disagreed on the above statement.

3. Risk assessment is regularly carried out on the employer's premises by SHE representatives.

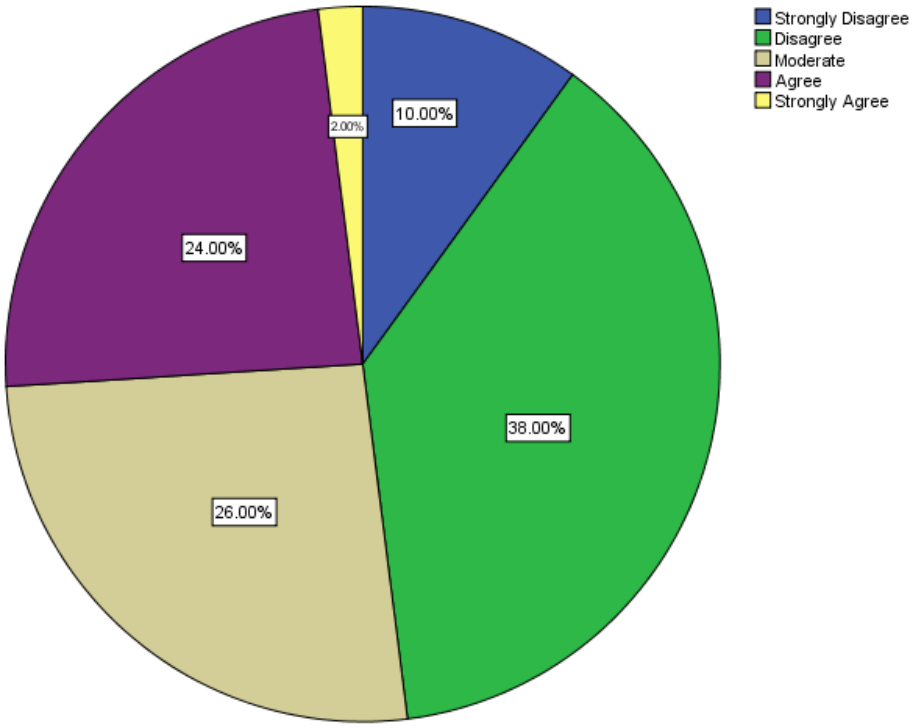

Figure 4.9: Emergency Preparedness - 3

Table 4.9: Emergency Preparedness - 3

	Frequency	Percent
Strongly Disagree	5	10.0
Disagree	19	38.0
Moderate	13	26.0
Agree	12	24.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.9 and Table 4.9, 26% of respondents were agreed that risk assessment is regularly carried out on the employer's premises by HSE representatives, while 26% of respondents were given moderate responses and 48% of respondents were disagreed on the above statement.

4.2.4 Safety Culture

1. Supervisors hold regular safety meetings with employees.

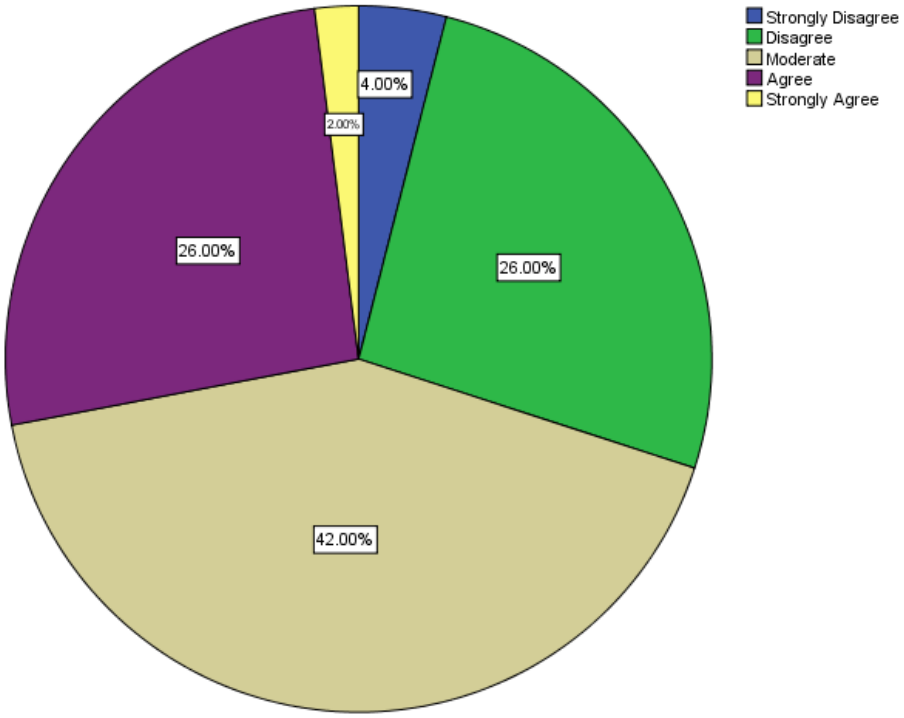

Figure 4.10: Safety Culture - 1

Table 4.10: Safety Culture - 1

	Frequency	Percent
Strongly Disagree	2	4.0
Disagree	13	26.0
Moderate	21	42.0
Agree	13	26.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.10 and Table 4.10, 28% of respondents were agreed that supervisors hold regular safety meetings with employees, while 42% of respondents were given moderate responses and 30% of respondents were disagreed on the above statement.

2. The employees respect safety rules and regulations in the company.

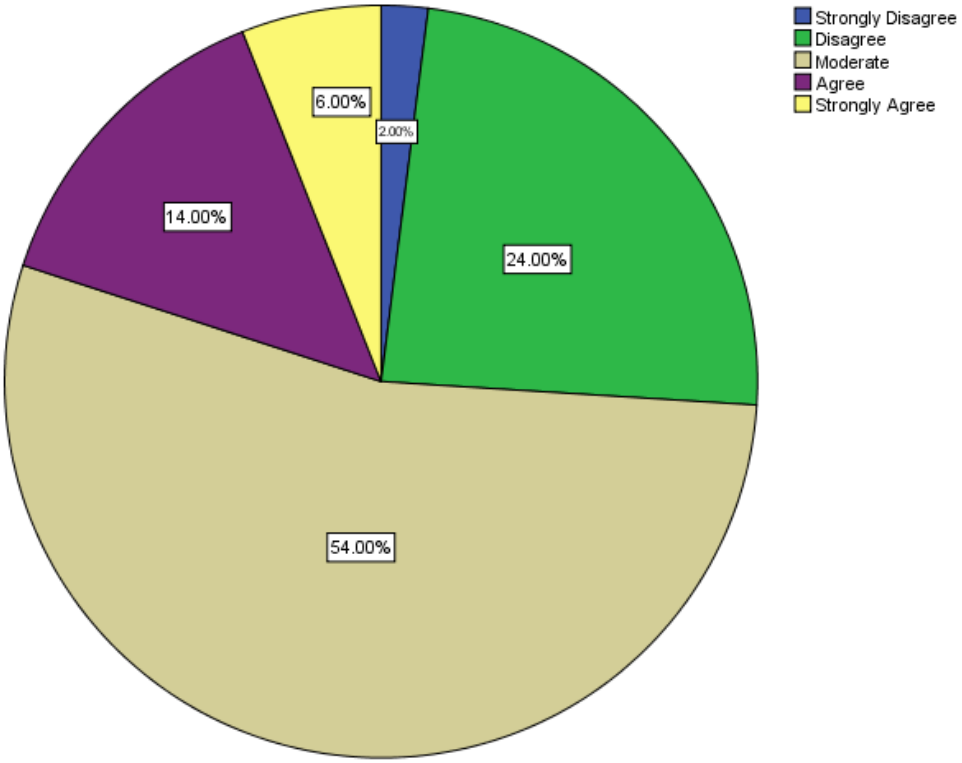

Figure 4.11: Safety Culture - 2

Table 4.11: Safety Culture - 2

	Frequency	Percent
Strongly Disagree	1	2.0
Disagree	12	24.0
Moderate	27	54.0
Agree	7	14.0
Strongly Agree	3	6.0
Total	50	100.0

As shown in Figure 4.11 and Table 4.11, 20% of respondents were agreed that the employees respect safety rules and regulations in the company, while 54% of respondents were given moderate responses and 26% of respondents were disagreed on the above statement.

3. The company employees concern about safety on day to day activities.

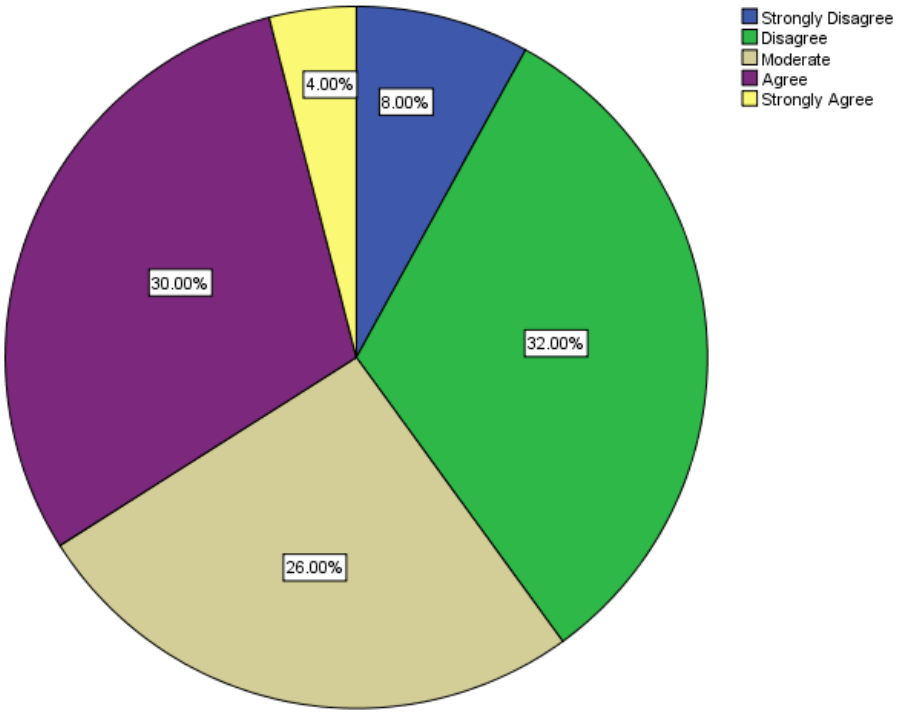

Figure 4.12: Safety Culture - 3

Table 4.12: Safety Culture - 3

	Frequency	Percent
Strongly Disagree	4	8.0
Disagree	16	32.0
Moderate	13	26.0
Agree	15	30.0
Strongly Agree	2	4.0
Total	50	100.0

As shown in Figure 4.12 and Table 4.12, 34% of respondents were agreed that the company employees concern about safety on day to day activities, while 26% of respondents were given moderate responses and 40% of respondents were disagreed on the above statement.

4.2.5 Involvement of HSE Professionals

1. The company gets updated about modern safety requirements by using internet.

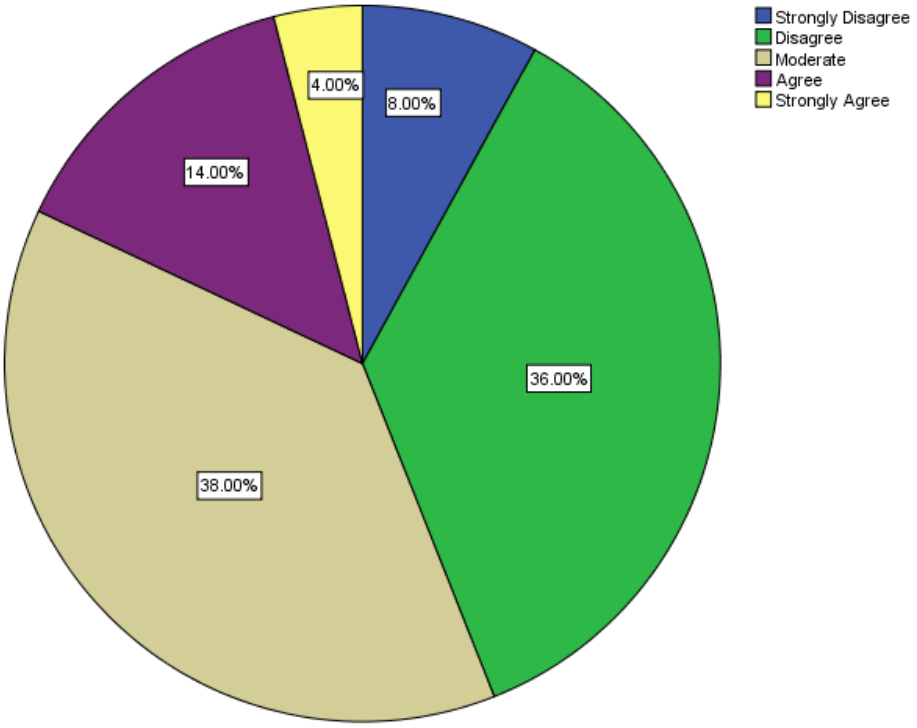

Figure 4.13: Involvement of HSE Professionals - 1

Table 4.13: Involvement of HSE Professionals - 1

	Frequency	Percent
Strongly Disagree	4	8.0
Disagree	18	36.0
Moderate	19	38.0
Agree	7	14.0
Strongly Agree	2	4.0
Total	50	100.0

As shown in Figure 4.13 and Table 4.13, 18% of respondents were agreed that the company gets updated about modern safety requirements by using internet, while 38% of respondents were given moderate responses and 44% of respondents were disagreed on the above statement.

2. The company has HSE professionals to assess their health and safety conditions.

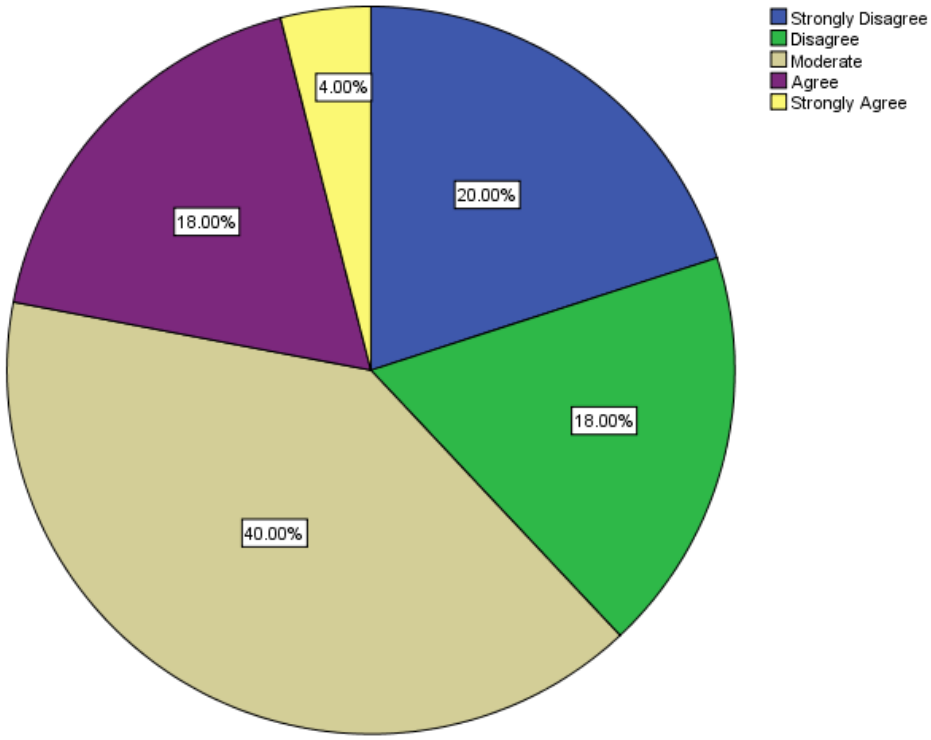

Figure 4.14: Involvement of HSE Professionals - 2

Table 4.14: Involvement of HSE Professionals - 2

	Frequency	Percent
Strongly Disagree	10	20.0
Disagree	9	18.0
Moderate	20	40.0
Agree	9	18.0
Strongly Agree	2	4.0
Total	50	100.0

As shown in Figure 4.14 and Table 4.14, 22% of respondents were agreed that the company has HSE professionals to assess their health and safety conditions, while 40% of respondents were given moderate responses and 38% of respondents were disagreed on the above statement.

3. The company applies international recognized safety precaution.

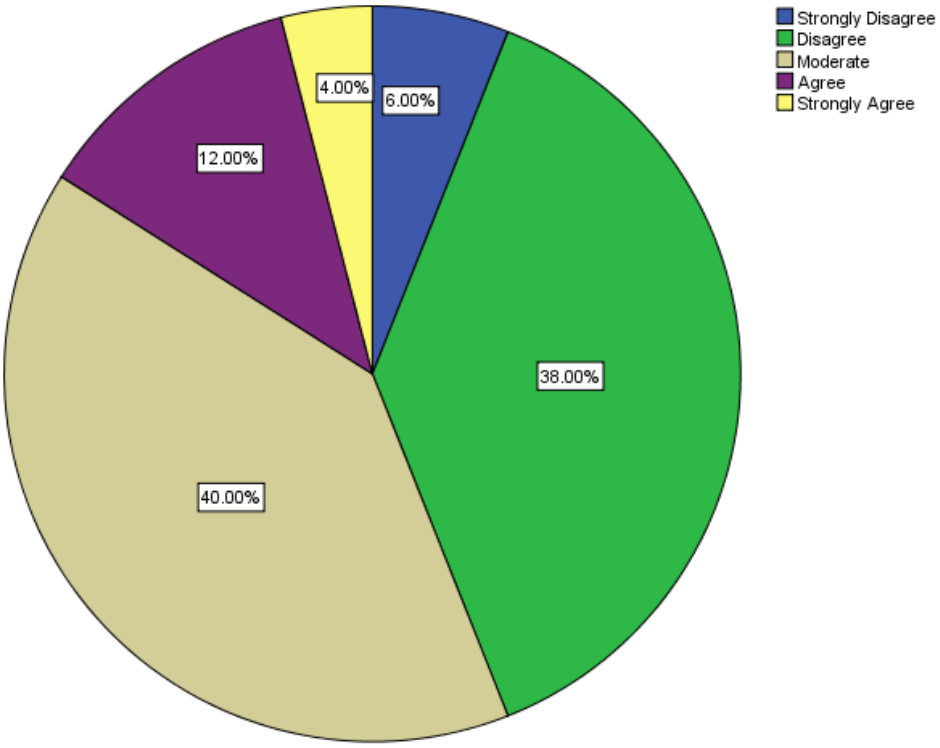

Figure 4.15: Involvement of HSE Professionals - 3

Table 4.15: Involvement of HSE Professionals - 3

	Frequency	Percent
Strongly Disagree	3	6.0
Disagree	19	38.0
Moderate	20	40.0
Agree	6	12.0
Strongly Agree	2	4.0
Total	50	100.0

As shown in Figure 4.15 and Table 4.15, 16% of respondents were agreed that the company applies international recognized safety precaution, while 40% of respondents were given moderate responses and 44% of respondents were disagreed on the above statement.

4.2.6 Health and Safety Related Disaster Resilience

1. The garment has the capacity to lead response and recovery actions or does it depend on external assistance to effectively respond to emergencies.

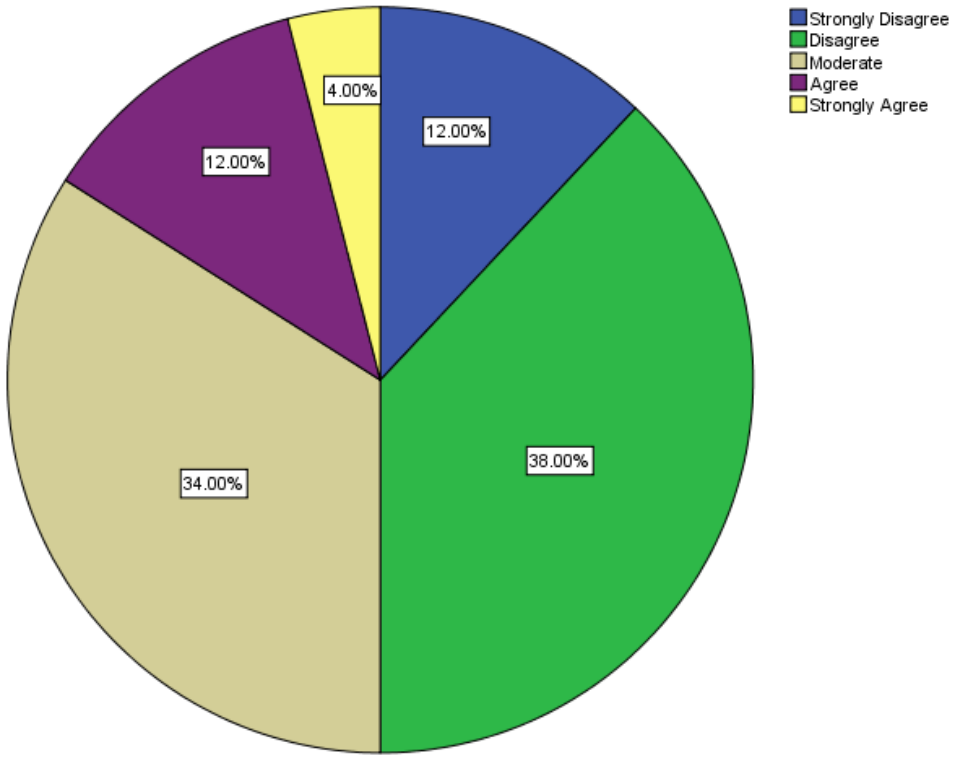

Figure 4.16: Health and Safety Related Disaster Resilience - 1

Table 4.16: Health and Safety Related Disaster Resilience - 1

	Frequency	Percent
Strongly Disagree	6	12.0
Disagree	19	38.0
Moderate	17	34.0
Agree	6	12.0
Strongly Agree	2	4.0
Total	50	100.0

As shown in Figure 4.16 and Table 4.16, 16% of respondents were agreed that the garment has the capacity to lead response and recovery actions or does it depend on external assistance to effectively respond to emergencies, while 34% of respondents were given moderate responses and 50% of respondents were disagreed on the above statement.

2. The garment should train own technical staff to handle emergency management system.

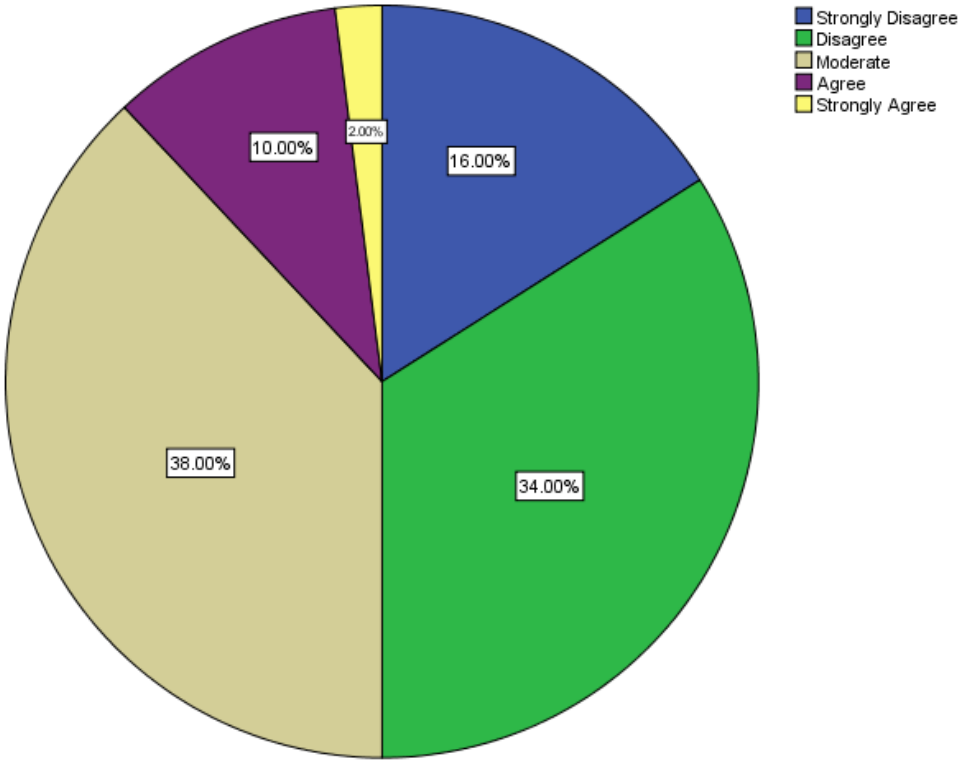

Figure 4.17: Health and Safety Related Disaster Resilience - 2

Table 4.17: Health and Safety Related Disaster Resilience - 2

	Frequency	Percent
Strongly Disagree	8	16.0
Disagree	17	34.0
Moderate	19	38.0
Agree	5	10.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.17 and Table 4.17, 12% of respondents were agreed that the garment should train own technical staff to handle emergency management system, while 38% of respondents were given moderate responses and 50% of respondents were disagreed on the above statement.

3. The garment faces difficult situations, when there are not sufficient materials to the manufacturing process.

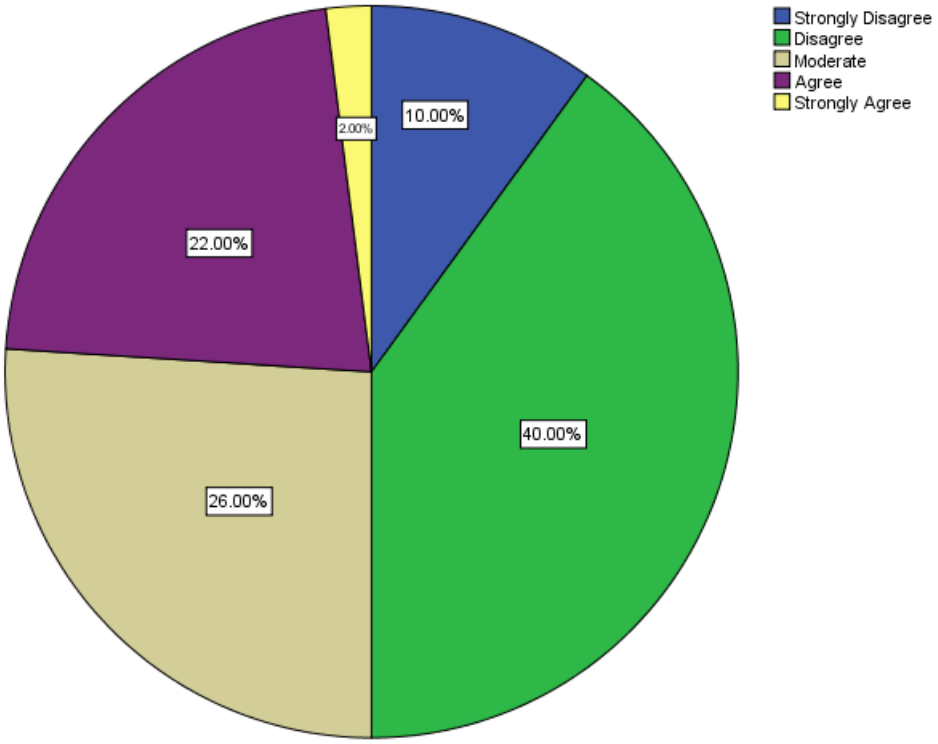

Figure 4.18: Health and Safety Related Disaster Resilience - 3

Table 4.18: Health and Safety Related Disaster Resilience - 3

	Frequency	Percent
Strongly Disagree	5	10.0
Disagree	20	40.0
Moderate	13	26.0
Agree	11	22.0
Strongly Agree	1	2.0
Total	50	100.0

As shown in Figure 4.18 and Table 4.18, 24% of respondents were agreed that the garment faces difficult situations, when there are not sufficient materials to the manufacturing process, while 26% of respondents were given moderate responses and 50% of respondents were disagreed on the above statement.

4. Awareness vs. Accidents

The second data collection has done through social compliance and health and safety audits reports which were conducted as part of social compliance and health and safety audits for Worldwide Responsible Accredited Production (WRAP).

WRAP is a USA based company operates all over the world certifying facilities under 12 principles. The WRAP Principles are based on generally accepted international workplace standards, local laws and workplace regulations, and include the spirit or language of relevant conventions of the International Labor Organization (ILO). The Principles encompass human resources management, health and safety, environmental practices, and legal compliance including import/export and customs compliance and security standards.

There were 50 audits reports analyzed under accidents, and accidents related awareness programs covering 50 apparel manufacturing facilities in Sri Lanka. Audits were conducted by professional health and safety auditors during last 9 months of period.

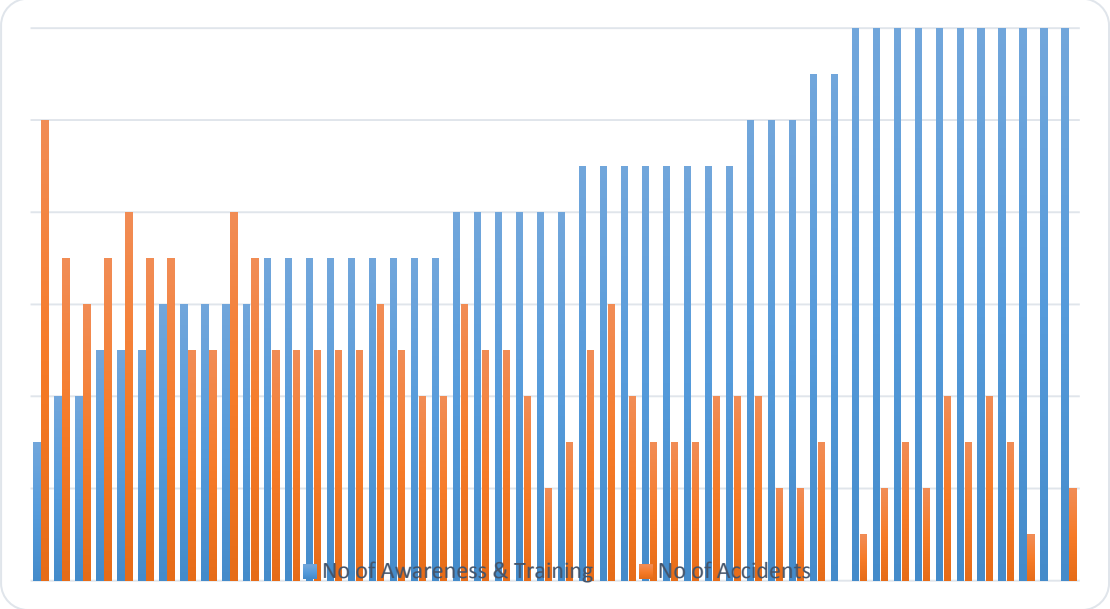

Figure 4.19: Health and Safety Related Disaster Resilience - 4

Table 4.19: Health and Safety Related Disaster Resilience - 4

Factory	No of Awareness & Training	No of Accidents	Factory	No of Awareness & Training	No of Accidents
1	12	1	26	12	3
2	3	10	27	6	5
3	5	7	28	7	5
4	8	6	29	6	8
5	9	5	30	7	6
6	10	4	31	12	4
7	5	8	32	12	3
8	12	2	33	11	0
9	7	5	34	9	4
10	8	5	35	9	3
11	4	7	36	10	2
12	6	7	37	9	3
13	9	6	38	8	4
14	12	3	39	7	5
15	10	2	40	9	3
16	11	3	41	8	2
17	4	6	42	7	4
18	7	5	43	6	7
19	12	2	44	8	3
20	7	5	45	9	4
21	5	7	46	12	1
22	6	5	47	12	0
23	7	5	48	9	4
24	8	5	49	7	4
25	12	4	50	12	2

As shown in Figure 4.19 and Table 4.19, it was noticed that, the companies which were not deployed dedicated health and safety staff were failed to established comprehensive safety and health policies and procedures. It has negative impact on providing health and safety training for new as well as exiting employees. Lack of Health and safety awareness and training has led to accidents and injuries in factories by not giving attention to on right time.

As per the findings of the questionnaire and the 50 audits reports, it was noted that 72% of factories have not fix safety signs visible enough. Factories have not implemented preventive safety systems and shown lack of knowledge of establishing preventive safety systems. Risk assessment is major activity of emergency preparedness but 48% of factories not conducting risk assessment regular basis. It was noted in the audit reports that, risk assessment has not conducted regular basis in factories. Safety is part of day today operational work and safety systems need to be built within operational activities.

As per the audits reports, factories which are focus on safety as part of culture are having less accidents and occupational health issues than others. It was noticed that factories which are deployed qualified and experience safety and health professional are more concern on preventive measures and updated with global requirements. Those were introduced more creative ideas on safety and minimize risk of disaster and non compliance issues.

4.3 Cronbach's Alpha Reliability Testing

The reliability analysis measures the consistency of the selected five independent variables and dependent variable separately. 10 respondents out of 50 respondents were selected to test Cronbach's alpha for all variables, which is 20% from the total sample.

4.3.1 Health & Safety Awareness and Training

Table 4.20: Reliability Statistics - Health & Safety Awareness and Training

Cronbach's Alpha	N of Items
.759	3

Table 4.21: Item-Total Statistics - Health & Safety Awareness and Training

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Health & Safety Awareness and Training - 1	5.10	1.211	.780	.440
Health & Safety Awareness and Training - 2	5.00	2.222	.309	.920
Health & Safety Awareness and Training - 3	5.30	.900	.806	.395

As shown in Table 4.20, Cronbach's alpha of the questions for health & safety awareness and training is 0.759, which is between 0.7 and 0.9. It expresses that there is good consistency between the question statements which measure this variable. Also the measurement of the individual question statements for health & safety awareness and training variable is shown in Table 4.21.

4.3.2 Implementation of Preventive Safety Systems

Table 4.22: Reliability Statistics - Implementation of Preventive Safety Systems

Cronbach's Alpha	N of Items
.753	3

Table 4.23: Item-Total Statistics - Implementation of Preventive Safety Systems

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Implementation of Preventive Safety Systems - 1	5.00	1.778	.796	.350
Implementation of Preventive Safety Systems - 2	5.00	2.222	.277	.920
Implementation of Preventive Safety Systems - 3	5.20	1.511	.757	.318

As shown in Table 4.22, Cronbach's alpha of the questions for implementation of preventive safety systems is 0.753, which is between 0.7 and 0.9. It expresses that there is good consistency between the question statements which measure this variable. Also the measurement of the individual question statements for implementation of preventive safety systems variable is shown in Table 4.23.

4.3.3 Emergency Preparedness

Table 4.24: Reliability Statistics - Emergency Preparedness

Cronbach's Alpha	N of Items
.738	3

Table 4.25: Item-Total Statistics - Emergency Preparedness

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Emergency Preparedness - 1	5.00	1.556	.756	.429
Emergency Preparedness - 2	5.00	2.667	.258	.917
Emergency Preparedness - 3	5.00	.889	.849	.250

As shown in Table 4.24, Cronbach's alpha of the questions for emergency preparedness is 0.738, which is between 0.7 and 0.9. It expresses that there is good

consistency between the question statements which measure this variable. Also the measurement of the individual question statements for emergency preparedness variable is shown in Table 4.25.

4.3.4 Safety Culture

Table 4.26: Reliability Statistics - Safety Culture

Cronbach's Alpha	N of Items
.790	3

Table 4.27: Item-Total Statistics - Safety Culture

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Safety Culture - 1	5.30	1.567	.776	.567
Safety Culture - 2	5.20	2.400	.578	.833
Safety Culture - 3	5.50	.944	.765	.659

As shown in Table 4.26, Cronbach's alpha of the questions for safety culture is 0.790, which is between 0.7 and 0.9. It expresses that there is good consistency between the question statements which measure this variable. Also the measurement of the individual question statements for safety culture variable is shown in Table 4.27.

4.3.5 Involvement of HSE Professionals

Table 4.28: Reliability Statistics - Involvement of HSE Professionals

Cronbach's Alpha	N of Items
.748	3

Table 4.29: Item-Total Statistics - Involvement of HSE Professionals

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Involvement of HSE Professionals- 1	4.90	2.322	.666	.574
Involvement of HSE Professionals- 2	4.60	2.267	.456	.824
Involvement of HSE Professionals - 3	4.70	2.233	.635	.597

As shown in Table 4.28, Cronbach's alpha of the questions for involvement of HSE professionals is 0.748, which is between 0.7 and 0.9. It expresses that there is good consistency between the question statements which measure this variable. Also the measurement of the individual question statements for involvement of HSE professionals variable is shown in Table 4.29.

4.3.6 Health and Safety Related Disaster Resilience

Table 4.30: Reliability Statistics - Health and Safety Related Disaster Resilience

Cronbach's Alpha	N of Items
.719	3

Table 4.31: Item-Total Statistics - Health and Safety Related Disaster Resilience

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Health and safety related disaster resilience - 1	5.00	2.000	.713	.311
Health and safety related disaster resilience - 2	4.70	2.900	.301	.966
Health and safety related disaster resilience - 3	4.70	2.011	.643	.421

As shown in Table 4.30, Cronbach's alpha of the questions for health and safety related disaster resilience is 0.719, which is between 0.7 and 0.9. It expresses that there is good consistency between the question statements which measure this variable. Also the measurement of the individual question statements for health and safety related disaster resilience variable is shown in Table 4.31.

4.4 Descriptive Statistical Analysis

This analysis shows descriptive statistics of all variables in this study. It includes mean, standard deviation, variance, skewness of the distribution curve of each variable. The histogram shows normal distribution curve for all variables separately. The behaviour of individual variable can be identified through descriptive statistics.

4.4.1 Health & Safety Awareness and Training

Table 4.32: Descriptive Statistics - Health & Safety Awareness and Training

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Health & Safety Awareness and Training - 1	50	4	1	5	2.86	.118	.833	.694	.273	.337
Health & Safety Awareness and Training - 2	50	4	1	5	2.96	.121	.856	.733	-.125	.337
Health & Safety Awareness and Training - 3	50	4	1	5	2.66	.127	.895	.800	.563	.337
Health & Safety Awareness and Training	50	3.33	1.33	4.67	2.8267	.10952	.77442	.600	.260	.337

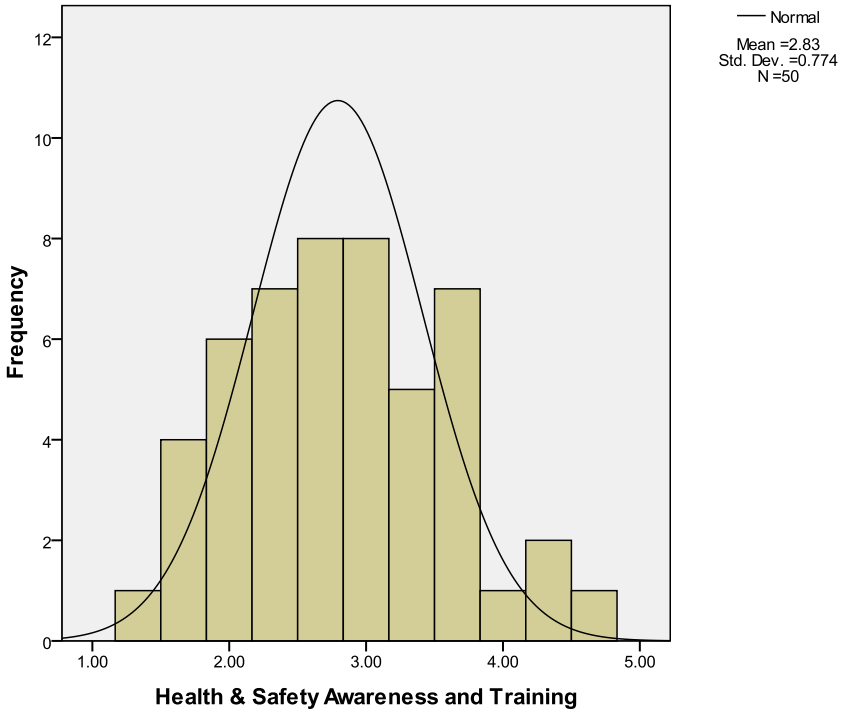

Figure 4.20: Histogram - Health & Safety Awareness and Training

According to Table 4.32 and 4.20, the mean value of the distribution is 2.826. It expresses that health & safety awareness and training is relatively high in the nature. Also the variance and standard deviation are 0.600 and 0.774 respectively. Also the skewness of the distribution is 0.260. Therefore, the data recorded for health & safety awareness and training is normally distributed.

4.4.2 Implementation of Preventive Safety Systems

Table 4.33: Descriptive Statistics - Implementation of Preventive Safety Systems

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Implementation of Preventive Safety Systems - 1	50	4	1	5	2.86	.118	.833	.694	.273	.337
Implementation of Preventive Safety Systems - 2	50	4	1	5	2.84	.172	1.218	1.484	.037	.337
Implementation of Preventive Safety Systems - 3	50	4	1	5	2.66	.127	.895	.800	.563	.337
Implementation of Preventive Safety Systems	50	3.33	1.33	4.67	2.7867	.11219	.79328	.629	.044	.337

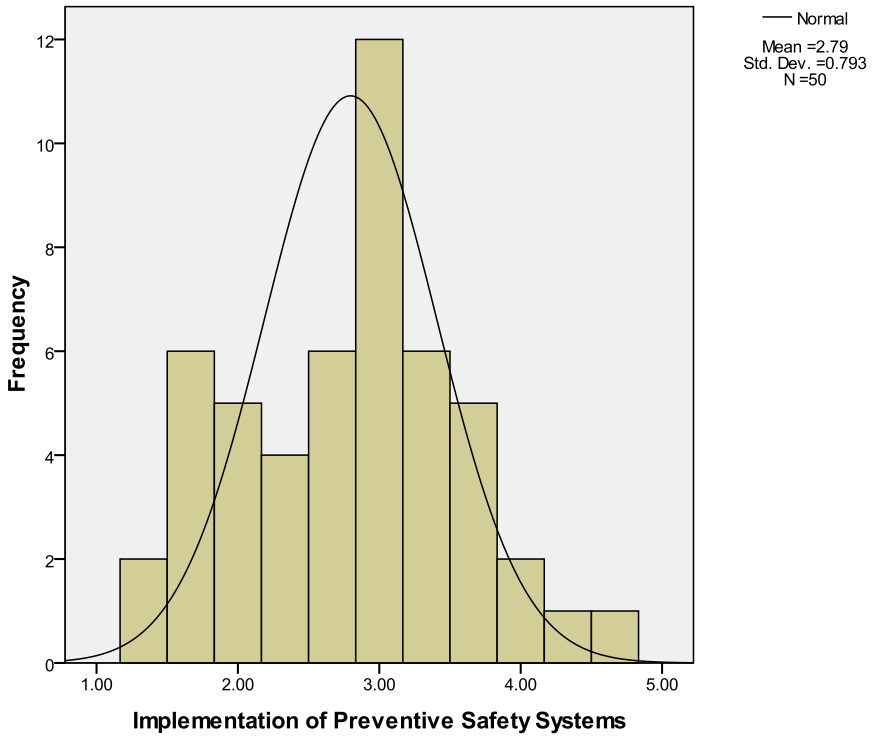

Figure 4.21: Histogram - Implementation of Preventive Safety Systems

According to Table 4.33 and 4.21, the mean value of the distribution is 2.786. It expresses that implementation of preventive safety systems is relatively high in the nature. Also the variance and standard deviation are 0.629 and 0.793 respectively. Also the skewness of the distribution is 0.044. Therefore, the data recorded for implementation of preventive safety systems is normally distributed.

4.4.3 Emergency Preparedness

Table 4.34: Descriptive Statistics - Emergency Preparedness

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Emergency Preparedness - 1	50	4	1	5	2.78	.115	.815	.665	.433	.337
Emergency Preparedness - 2	50	4	1	5	2.72	.111	.784	.614	.547	.337
Emergency Preparedness - 3	50	4	1	5	2.70	.144	1.015	1.031	.158	.337
Emergency Preparedness	50	3.33	1.33	4.67	2.7333	.10817	.76488	.585	.378	.337

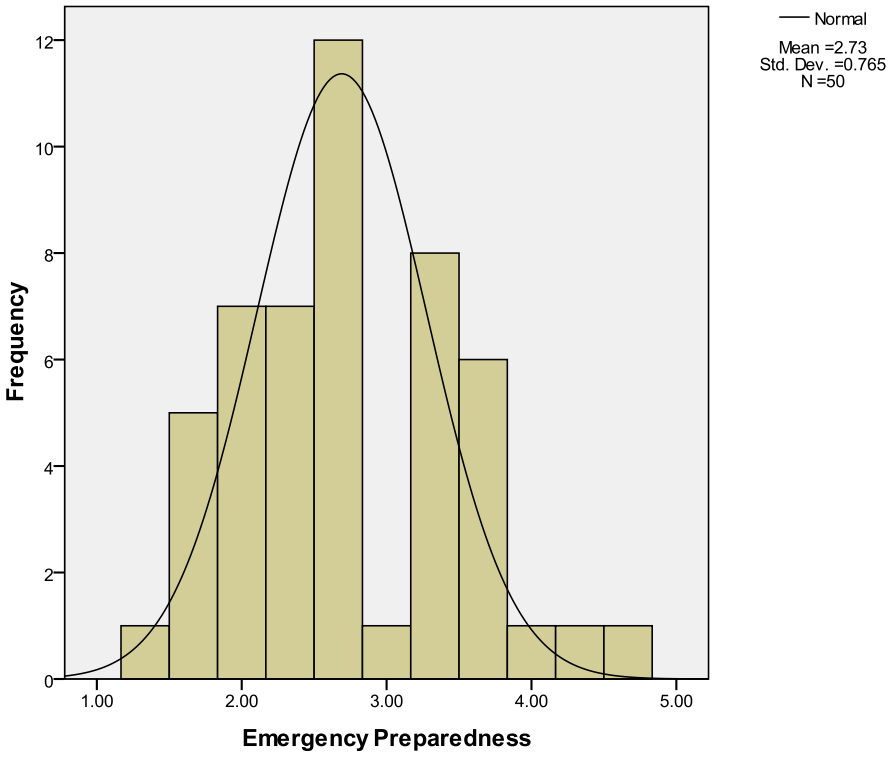

Figure 4.22: Histogram - Emergency Preparedness

According to Table 4.34 and 4.22, the mean value of the distribution is 2.733. It expresses that emergency preparedness is relatively high in the nature. Also the

variance and standard deviation are 0.585 and 0.765 respectively. Also the skewness of the distribution is 0.378. Therefore, the data recorded for emergency preparedness is normally distributed.

4.4.4 Safety Culture

Table 4.35: Descriptive Statistics - Safety Culture

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Safety Culture - 1	50	4	1	5	2.96	.124	.880	.774	-.108	.337
Safety Culture - 2	50	4	1	5	2.98	.119	.845	.714	.462	.337
Safety Culture - 3	50	4	1	5	2.90	.149	1.055	1.112	-.011	.337
Safety Culture	50	3.67	1.33	5.00	2.9467	.12023	.85013	.723	.125	.337

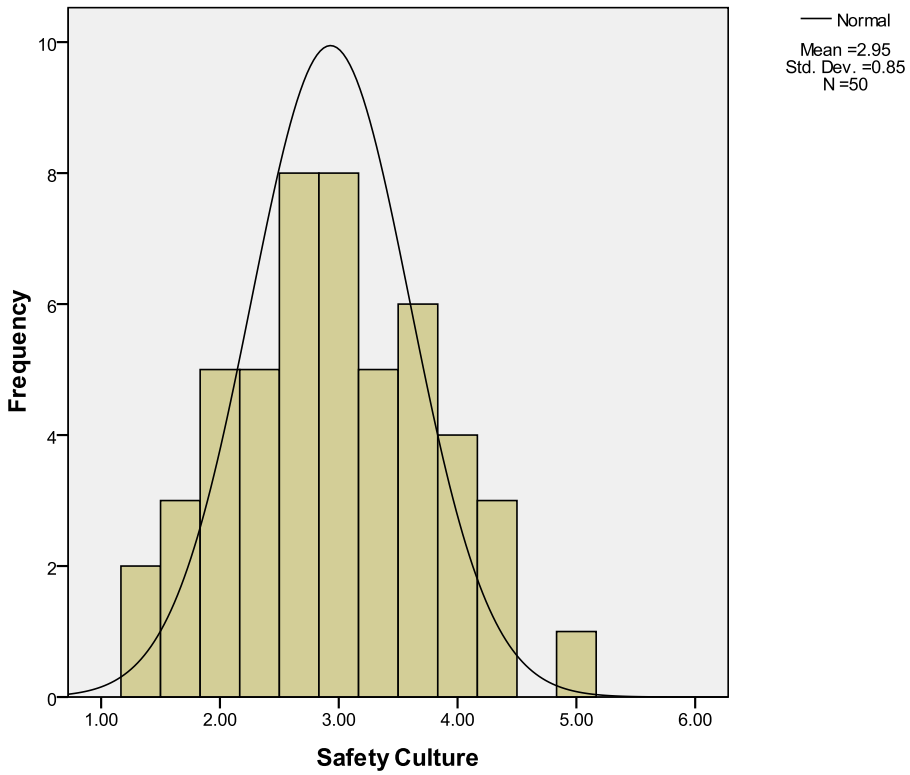

Figure 4.23: Histogram - Safety Culture

According to Table 4.35 and 4.23, the mean value of the distribution is 2.946. It expresses that safety culture is relatively high in the nature. Also the variance and standard deviation are 0.723 and 0.850 respectively. Also the skewness of the

distribution is 0.125. Therefore, the data recorded for safety culture is normally distributed.

4.4.5 Involvement of HSE Professionals

Table 4.36: Descriptive Statistics - Involvement of HSE Professionals

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Involvement of HSE Professionals - 1	50	4	1	5	2.74	.135	.953	.908	.354	.337
Involvement of HSE Professionals - 2	50	4	1	5	2.78	.158	1.115	1.242	-.060	.337
Involvement of HSE Professionals - 3	50	4	1	5	2.76	.129	.909	.827	.475	.337
Involvement of HSE Professionals	50	4.00	1.33	5.33	2.7600	.12636	.89351	.798	.595	.337

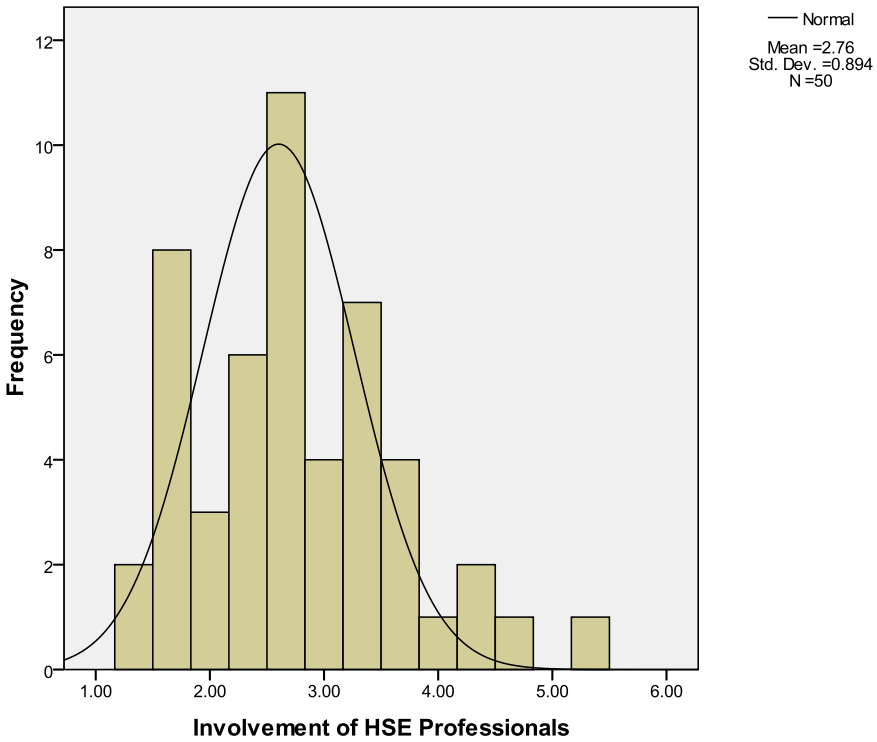

Figure 4.24: Histogram - Involvement of HSE Professionals

According to Table 4.36 and 4.24, the mean value of the distribution is 2.760. It expresses that involvement of HSE professionals is relatively high in the nature. Also

the variance and standard deviation are 0.798 and 0.893 respectively. Also the skewness of the distribution is 0.595. Therefore, the data recorded for involvement of HSE professionals is normally distributed.

4.4.6 Health and Safety Related Disaster Resilience

Table 4.37: Descriptive Statistics - Health and Safety Related Disaster Resilience

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error
Health and safety related disaster resilience - 1	50	4	1	5	2.58	.140	.992	.983	.423	.337
Health and safety related disaster resilience - 2	50	4	1	5	2.48	.135	.953	.908	.207	.337
Health and safety related disaster resilience - 3	50	4	1	5	2.66	.142	1.002	1.004	.236	.337
Health and safety related disaster resilience	50	3.00	1.33	4.33	2.5733	.10215	.72230	.522	.352	.337

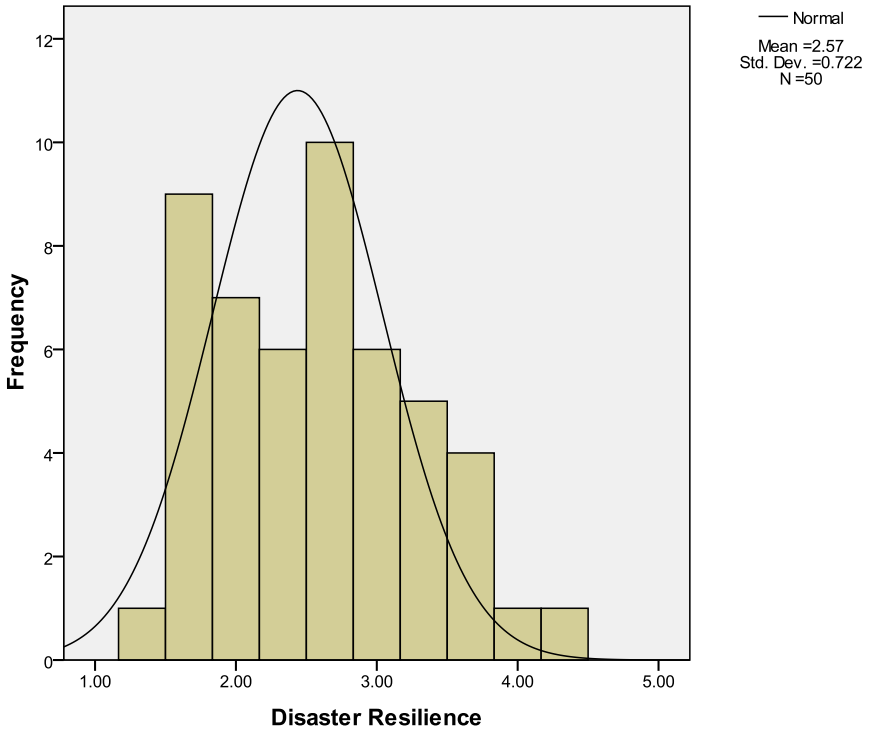

Figure 4.25: Histogram - Health and Safety Related Disaster Resilience

According to Table 4.37 and 4.25, the mean value of the distribution is 2.573. It expresses that health and safety related disaster resilience is relatively high in the

nature. Also the variance and standard deviation are 0.522 and 0.722 respectively. Also the skewness of the distribution is 0.352. Therefore, the data recorded for health and safety related disaster resilience is normally distributed.

4.5 Correlation Analysis

The correlation of coefficient shows the level of relationship between each independent variable with dependent variable. Therefore, it helps to identify the numerical representation of strengths and the direction of the each relationship.

Table 4.38: Correlations

		Health & Safety Awareness and Training	Implementation of Preventive Safety Systems	Emergency Preparedness	Safety Culture	Involvement of HSE Professionals
Health & Safety Awareness and Training	Pearson Correlation	1	.917**	.969**	.971**	.794**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	50	50	50	50	50
Implementation of Preventive Safety Systems	Pearson Correlation	.917**	1	.906**	.884**	.716**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	50	50	50	50	50
Emergency Preparedness	Pearson Correlation	.969**	.906**	1	.916**	.764**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	50	50	50	50	50
Safety Culture	Pearson Correlation	.971**	.884**	.916**	1	.759**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	50	50	50	50	50
Involvement of HSE Professionals	Pearson Correlation	.794**	.716**	.764**	.759**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	50	50	50	50	50
Health and Safety Related Disaster Resilience	**Pearson Correlation**	**.830****	**.819****	**.878****	**.749****	**.746****
	Sig. (2-tailed)	**.000**	**.000**	**.000**	**.000**	**.000**
	N	**50**	**50**	**50**	**50**	**50**

4.5.1 Health & Safety Awareness and Training

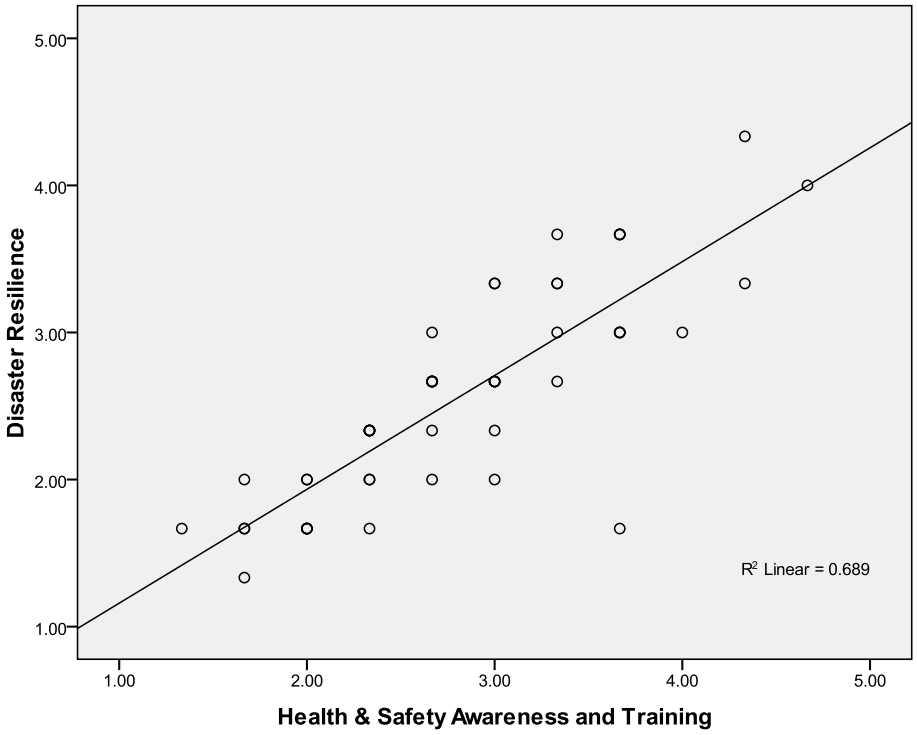

Figure 4.26: Scatter plot diagram between health & safety awareness and training, and health and safety related disaster resilience

According to Table 4.38 and Figure 4.26, the Pearson correlation between health & safety awareness and training, and health and safety related disaster resilience is 0.830 and that is positive value. It shows that there is a strong positive relationship between these two variables. Also the relationship is statistically significant at 0.000 levels (2-tailed). Hence it proves that health & safety awareness and training, and health and safety related disaster resilience is positively correlated.

4.5.2 Implementation of Preventive Safety Systems

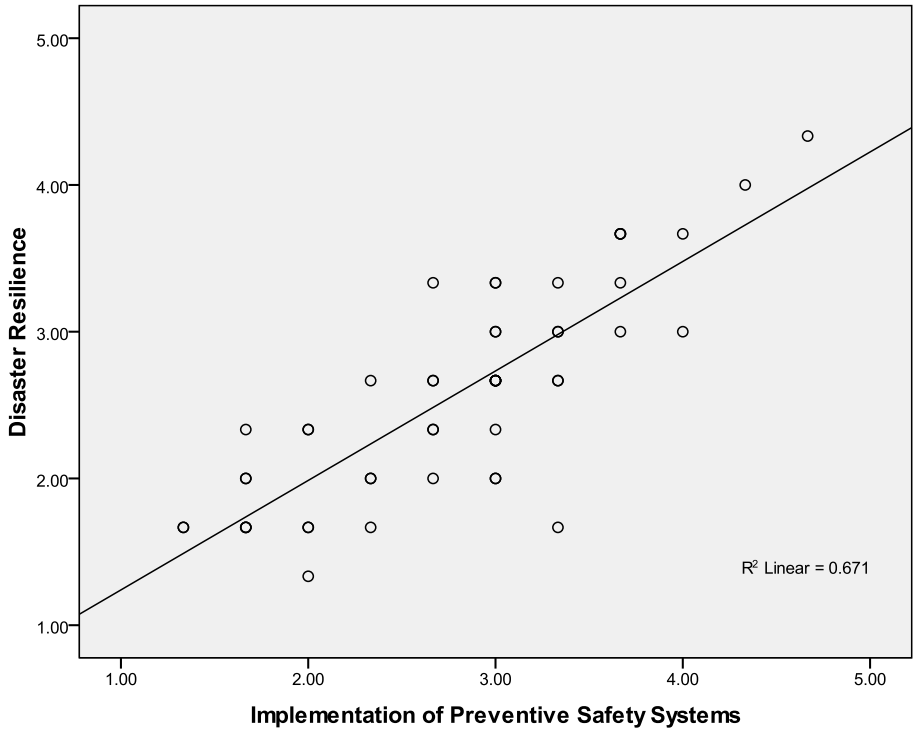

Figure 4.27: Scatter plot diagram between implementation of preventive safety systems, and health and safety related disaster resilience

According to Table 4.38 and Figure 4.27, the Pearson correlation between implementation of preventive safety systems, and health and safety related disaster resilience is 0.819 and that is positive value. It shows that there is a strong positive relationship between these two variables. Also the relationship is statistically significant at 0.000 levels (2-tailed). Hence it proves that implementation of preventive safety systems, and health and safety related disaster resilience is positively correlated.

4.5.3 Emergency Preparedness

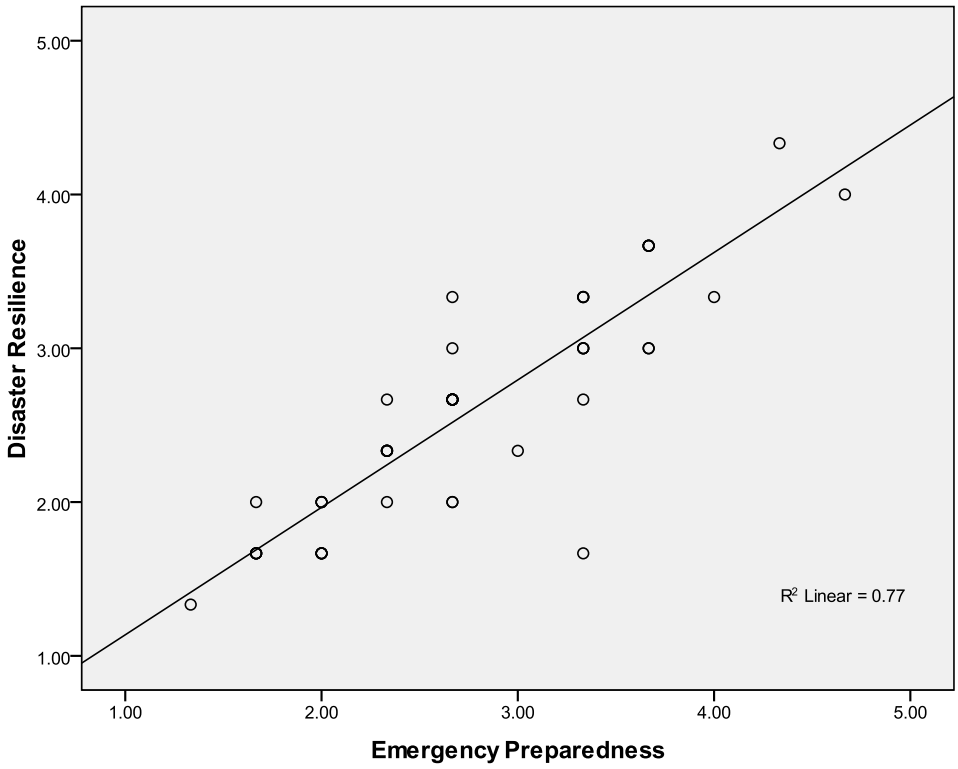

Figure 4.28: Scatter plot diagram between emergency preparedness, and health and safety related disaster resilience

According to Table 4.38 and Figure 4.28, the Pearson correlation between emergency preparedness, and health and safety related disaster resilience is 0.878 and that is positive value. It shows that there is a strong positive relationship between these two variables. Also the relationship is statistically significant at 0.000 levels (2-tailed). Hence it proves that emergency preparedness, and health and safety related disaster resilience is positively correlated.

4.5.4 Safety Culture

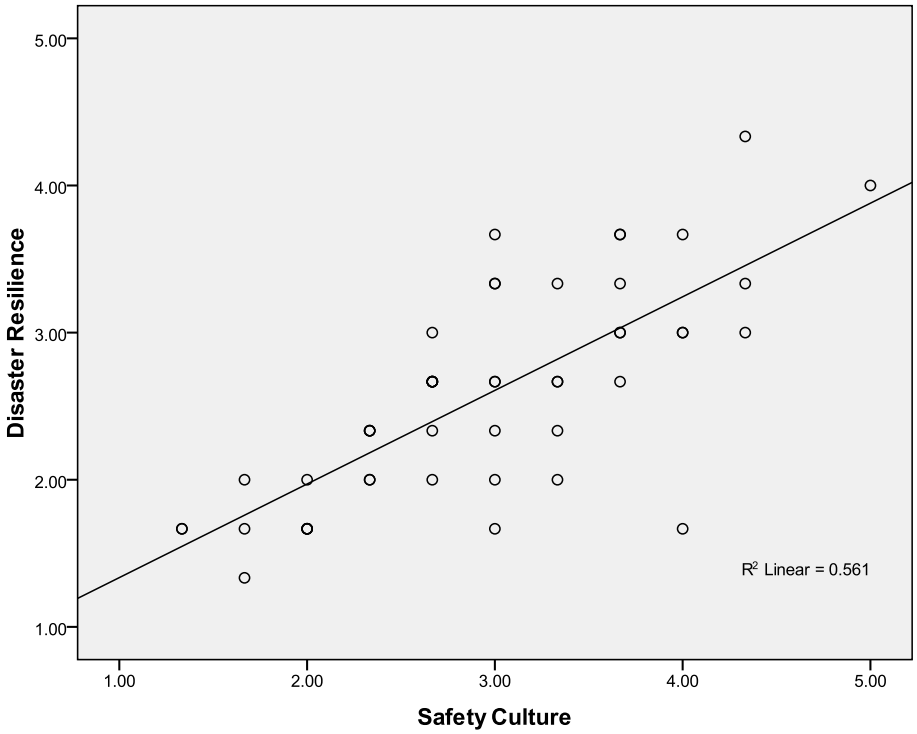

Figure 4.29: Scatter plot diagram between safety culture, and health and safety related disaster resilience

According to Table 4.38 and Figure 4.29, the Pearson correlation between safety culture, and health and safety related disaster resilience is 0.749 and that is positive value. It shows that there is a good positive relationship between these two variables. Also the relationship is statistically significant at 0.000 levels (2-tailed). Hence it proves that safety culture, and health and safety related disaster resilience is positively correlated.

4.5.5 Involvement of HSE Professionals

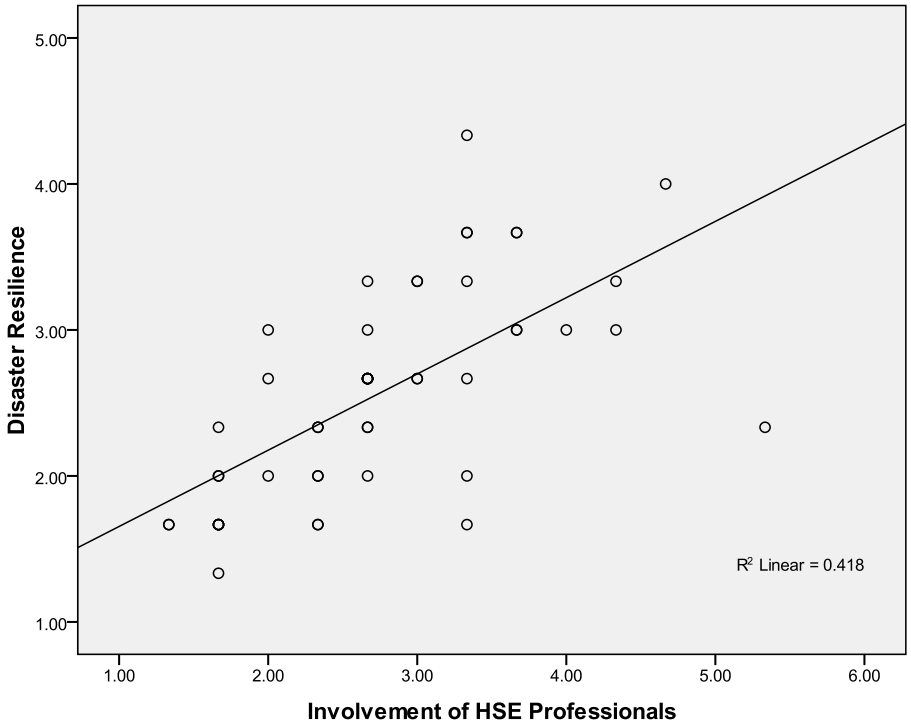

Figure 4.30: Scatter plot diagram between involvement of HSE professionals, and health and safety related disaster resilience

According to Table 4.38 and Figure 4.30, the Pearson correlation between involvement of HSE professionals, and health and safety related disaster resilience is 0.746 and that is positive value. It shows that there is a good positive relationship between these two variables. Also the relationship is statistically significant at 0.000 levels (2-tailed). Hence it proves that involvement of HSE professionals, and health and safety related disaster resilience are positively correlated.

4.6 Multiple Regression Analysis

Multiple regression analysis identifies the impact of the variance as a percentage on dependent variable when there is one or more independent variable(s). Significance values give the most significant and least significance variable in this study.

Table 4.39: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.895[a]	.802	.779	.33938	.802	35.590	5	44	.000

a. Predictors: (Constant), Involvement of HSE Professionals, Implementation of Preventive Safety Systems, Safety Culture, Emergency Preparedness, Health & Safety Awareness and Training

Table 4.40: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	20.496	5	4.099	35.590	.000[a]
	Residual	5.068	44	.115		
	Total	25.564	49			

a. Predictors: (Constant), Involvement of HSE Professionals, Implementation of Preventive Safety Systems, Safety Culture, Emergency Preparedness, Health & Safety Awareness and Training

b. Dependent Variable: Health and Safety Related Disaster Resilience

Table 4.41: Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	.305	.186		1.643	.108	-.069	.679
Health & Safety Awareness and Training	.298	.500	.319	.595	.555	-.710	1.306
Implementation of Preventive Safety Systems	.224	.156	.246	1.439	.157	-.090	.537
Emergency Preparedness	.846	.290	.896	2.920	.005	.262	1.430
Safety Culture	.489	.264	.576	1.852	.071	.021	.643
Involvement of HSE Professionals	.025	.090	.031	.280	.781	-.206	.156

a. Dependent Variable: Health and Safety Related Disaster Resilience

As shown in above three tables, the multiple regression equation of five independent variables and dependent variable is:

Health and Safety Related Disaster Resilience = 0.305 + 0.319(HSAT) + 0.246(IPSS) + 0.896(EP) + 0.576(SC) + 0.031(IHSEP)

The gradient of the multiple regression equation, which is b value is 0.305 and that is significant at 1% (significant = 0.000). As shown by Adjusted R Squared, 77.9% of variance of health and safety related disaster resilience is defined by five independent variables with the standardized beta value of 0.319, 0.246, 0.896, 0.576 and 0.031 respectively. The results from data analysis show that emergency preparedness variable is the main factor which impact on dependent variable, while involvement of HSE professionals variable gives the least impact on dependent variable.

4.7 Hypotheses Testing

Table 4.42: Chi-Squared Test

	Health & Safety Awareness and Training	Implementation of Preventive Safety Systems	Emergency Preparedness	Safety Culture	Involvement of HSE Professionals
Chi-Square	18.200	22.160	31.840	11.160	27.280
Df	10	10	10	10	11
Asymp. Sig.	.042	.014	.000	.034	.004

Chi-Squared test was used to validate the five hypotheses of the study.

4.7.1 Hypothesis 1 - Health & Safety Awareness and Training vs. Health and Safety Related Disaster Resilience

H_1: There is a positive relationship between health & safety awareness and training, and health and safety related disaster resilience.

H_0: There is no relationship between health & safety awareness and training, and health and safety related disaster resilience.

As shown in Table 4.42, P-value, which is the significant value of health and safety related disaster resilience is 0.042 ($P<0.05$), so the P-value is under 0.05. Hence the null hypothesis is rejected. Also the test insights is measurably shown as an important.

Therefore, there is a positive relationship between health & safety awareness and training, and health and safety related disaster resilience.

4.7.2 Hypothesis 2 - Implementation of Preventive Safety Systems vs. Health and Safety Related Disaster Resilience

H_2: There is a positive relationship between implementation of preventive safety systems, and health and safety related disaster resilience.

H_0: There is no relationship between implementation of preventive safety systems, and health and safety related disaster resilience.

As shown in Table 4.42, P-value, which is the significant value of health and safety related disaster resilience is 0.014 ($P<0.05$), so the P-value is under 0.05. Hence the null hypothesis is rejected. Also the test insights is measurably shown as an important. Therefore, there is a positive relationship between implementation of preventive safety systems, and health and safety related disaster resilience.

4.7.3 Hypothesis 3 - Emergency Preparedness vs. Health and Safety Related Disaster Resilience

H_3: There is a positive relationship between emergency preparedness, and health and safety related disaster resilience.

H_0: There is no relationship between emergency preparedness, and health and safety related disaster resilience.

As shown in Table 4.42, P-value, which is the significant value of health and safety related disaster resilience is 0.000 ($P<0.05$), so the P-value is under 0.05. Hence the null hypothesis is rejected. Also the test insights is measurably shown as an important. Therefore, there is a positive relationship between emergency preparedness, and health and safety related disaster resilience.

4.7.4 Hypothesis 4 - Safety Culture vs. Health and Safety Related Disaster Resilience

H_4: There is a positive relationship between safety culture, and health and safety related disaster resilience.

H_0: There is no relationship between safety culture, and health and safety related disaster resilience.

As shown in Table 4.42, P-value, which is the significant value of health and safety related disaster resilience is 0.034 (P<0.05), so the P-value is under 0.05. Hence the null hypothesis is rejected. Also the test insights is measurably shown as an important. Therefore, there is a positive relationship between safety culture, and health and safety related disaster resilience.

4.7.5 Hypothesis 5 - Involvement of HSE Professionals vs. Health and Safety Related Disaster Resilience

H_5: There is a positive relationship between involvement of HSE professionals, and health and safety related disaster resilience.

H_0: There is no relationship between involvement of HSE professionals, and health and safety related disaster resilience.

As shown in Table 4.42, P-value, which is the significant value of health and safety related disaster resilience is 0.004 (P<0.05), so the P-value is under 0.05. Hence the null hypothesis is rejected. Also the test insights is measurably shown as an important. Therefore, there is a positive relationship between involvement of HSE professionals, and health and safety related disaster resilience.

CHAPTER 5 - CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

In this research study, final outcomes and conclusion demonstrated from previous research studies continue extensively offered in literature review chapter of this nicely arranged research report, by the main objective of this research understanding of into the linked point of focused. In present complex business situation in the Sri Lankan apparel industry, health and safety related disaster resilience is a significant and essential concept when controlling production system in apparel factories and most of the apparel factories in Sri Lankan apparel industry are not using proper health and safety related disaster resilience strategies for their internal business operations. In addition to this may be suggested to the important of health and safety related disaster resilience practices in the present business scenario's apparel factories in Sri Lanka. Furthermore, in this research study, the researcher was also selected a sample size of both top level management and normal employees of the apparel factories in Sri Lanka.

5.2 Conclusion of the study

The main aim of the research is about the adaptive capacities in apparel industry towards health and safety related disaster resilience in Sri Lanka. The researcher is achieved 1st research objective, which is "to identify the concepts associated with health and safety related disaster resilience in Sri Lanka's apparel industry" by briefly reviews the available literature of different authors' works that is related to the adaptive capacities towards health and safety related disaster resilience in apparel industry in Sri Lanka.

The researcher is achieved the 2nd research objective which is "to identify how well the Sri Lanka's apparel industry is applied the disaster management strategies and practices" by conducting survey for Sri Lanka's apparel industry and analyzing collected data through the surveys. According to the data analysis, the researcher is gained strong positive correlation values for five independent variables with dependent variable from the correlation analysis. According to the hypotheses validation, P-value, which is the significant values of dependent variable is less than

0.05 for all five hypotheses. Therefore, all five null hypotheses are being rejected in this research.

Finally, the researcher is achieved 3rd research objective, which is "to give recommendations that can be taken up from the concept of health and safety related disaster resilience in order to apply for Sri Lankan's apparel industry" by derived the final results from the analysis and suggesting the appropriate recommendations for health and safety related disaster resilience to Sri Lankan's apparel industry.

5.3 Recommendations

The apparel industry is one of the main significant industry in the Sri Lankan business situation, and it is a significant industry in Sri Lanka's export trade. Therefore, Sri Lankan apparel industry is encompassing many types of apparel product manufacturers and they are manufacturing export quality ladies and gents' apparels. Most of these apparel factories are doing their apparel manufacturing actions in special industrial zones. Moreover, many apparel factories are taking appropriately succeeded management and administrative system.

In Sri Lankan apparel industry, apparel manufacturing companies need to provide proper and industry standard health and safety awareness training to all managers, supervisors, employees, contractors and suppliers. Also, as one of the leading high quality apparel product manufacturing sector, Sri Lankan apparel industry need to reinforce organizational employees, managers and supervisors' knowledge of their job related responsibilities under the occupational health and safety act and the industrial sector employees' rights guaranteed by the act.

Also, Sri Lankan apparel industry apparel manufacturing companies need to train there each and every level staff member on techniques for identifying organizational job related safety issues, such as job hazard analysis. Moreover, organization needs to provide proper information on the safety and health related risk of the workplace and the controls for those risks.

Apparel manufacturing sector is one of the significant manufacturing industry in many Asian countries. In most of the times, apparel industry faces different types of natural and man-made disasters and emergency situations. It can be face long-term

profit of the apparel manufacturing company. Therefore, Sri Lankan apparel manufacturing companies need to implement new computerized health and safety administration system and company need to handle every organizational employee's health status records in computerized system.

When facing present world disaster situations, apparel industry in Sri Lanka needs to develop well planned emergency management system and regularly company need to implement up-to-date equipment's to the organizational emergency preparedness procedure.

In Sri Lankan apparel manufacturing industry, every apparel manufacturer should establish organizational culture as a safe and healthiest work environment to each and every employee those who are employees' in the company. Also, they need to manage workforce friendly factory environment and office environment with health and safety management equipments (including fire protection system, eco-friendly ventilation system and etc).

Apparel manufacturing industry is one of the highly knowledge based sector and in many times, apparel industry needs to use innovative knowledge to handle health and safety related disaster resilience in apparel industry in Sri Lanka. Therefore, apparel manufacturing companies in Sri Lanka need to provide industry related practical knowledge to the HSE professionals involvement procedure to the health and safety related disaster resilience in apparel industry in Sri Lanka.

5.4 Suggestions for Further Research

Sri Lankan apparel industry is containing diversified apparel product manufacturing businesses and that are having many levels of market segments in Sri Lanka and foreign countries. Because of the health and safety related disaster resilience practices, Sri Lanka's apparel industry apparel factories is facing several types of positive and negative disaster impacts business performance. Therefore, this research is based on the study about the adaptive capacities in apparel industry towards health and safety related disaster resilience in Sri Lanka.

For further research studies, the researcher recommends that use a bigger sample size of apparel businesses entrepreneurs covers extensive sequence in the social structure. Use of the larger sample size there would continue lesser scientific issues and there

would endure superior probability on the limitation the consequences to the present business situation at a greater level. Novel stylish questionnaire over the physiologist would endure used to entry greatly reliable information on the study of the influence of health and safety related disaster resilience in Sri Lanka's apparel industry. In the analysis, the step of accomplishment of the industry records of the business from apparel factories in Sri Lanka would sustain used in order to creating an additional constant place for apparel industry businesses health and safety related disaster resilience in Sri Lanka's apparel manufacturing companies. Health and safety awareness and training, implementation of preventive safety systems, emergency preparedness, safety culture and involvement of HSE professionals capable above health and safety related disaster resilience in apparel industry can moreover sustain kept into reproduction through task further research studies.

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APPENDICES

Appendix I - Questionnaire

Based on the relevance of each question for the given factor, below scale is weighted.

Strongly Disagree	1
Disagree	2
Moderate	3
Agree	4
Strongly Agree	5

#	Questions	Strongly Disagree	Disagree	Moderate	Agree	Strongly Agree
1	The garment is providing an applicable training on health and safety procedures for new employees.					
2	The garment periodically evaluates and updates its safety policies and procedures.					
3	There are dedicated full time safety and health staff who manage the program.					
4	The company has a safety and health management system that assigns roles and responsibilities to all employees and management.					
5	Safety signs are visible for everyone to see in the company.					
6	Health and safety warnings provided to the suppliers if the materials are defect.					
7	Regular maintenance is important factor for effective emergency management.					

8	Inspectors impose fines and penalties when the employer is non-compliant.					
9	Risk assessment is regularly carried out on the employer's premises by SHE representatives.					
10	Supervisors hold regular safety meetings with employees.					
11	The employees respect safety rules and regulations in the company.					
12	The company employees concern about safety on day to day activities.					
13	The company gets updated about modern safety requirements by using internet.					
14	The company has HSE professionals to assess their health and safety conditions.					
15	The company applies international recognized safety precaution.					
16	The garment has the capacity to lead response and recovery actions or does it depend on external assistance to effectively respond to emergencies.					
17	The garment should train own technical staff to handle emergency management system.					
18	The garment faces difficult situations, when there are not sufficient materials to the manufacturing process.					

THANKS FOR YOUR COOPERATION!!!