AN ABSTRACT OF THE THESIS OF

Ali Moghaddam Vahed for the degree of Master of Science in Civil Engineering presented on March 12, 2015.

Title: Framework for Assessing the Potential Safety Performance of Construction Mechanical and Electrical Field Employees.

Abstract approved:

_____

John A. Gambatese

In the field of construction safety, many researchers have worked to create assessment tools. These tools focus on different aspects of construction safety, such as assessing safety climate, safety culture, etc. Although research indicates that the majority of incidents are caused by unsafe behaviors and acts, there are no comprehensive tools for assessing the potential safety performance of field employees. Knowledge about employee's safety performance is not known to the company before employees start work; thus, such a tool would help to prevent injuries.

This thesis describes a research effort to develop a safety assessment tool and framework to provide information to companies with regards to their employees' knowledge. The tool focuses on

mechanical and electrical construction contractors and was developed using a comprehensive literature review, field surveys, and analysis of personal demographic factors, risk perceptions, hazard identification, and safety knowledge.

The field survey had four different sections that captured demographic factors, risk perceptions, hazard identification, and safety knowledge. Using a survey methodology, a Likert scale was used to measure employees' perception of the effects of different factors. The average frequencies of four severity categories were obtained for eleven mechanical trade-related and eleven electrical trade-related risk scenarios. Employees were asked to identify hazards depicted in picture scenarios and answer safety knowledge questions. Input was provided by mechanical and electrical trade field employees, managers, engineers, and safety professionals. More than 6,500 data points were obtained from the surveys.

The analytical section included response processing that converted the ratings obtained from surveys into unit risks, calculated hazard indices, and graded safety knowledge test questions. The unit risks were calculated for each of the scenarios based on the incident analysis, which was conducted on more than 1,500 OSHA incident records for mechanical and electrical trades.

The data was used to create the weighing for each of the sections in the tool. Moreover, the perceptions among different survey participant groups were compared in each of the main categories. The respondents and expert panel's responses were also compared. The results indicated that there are some differences between the perceptions of different groups. Job Security, Job Level, and Job Number showed the highest number of differences among categories. On the other hand, except for few risk measures, no appreciable differences were observed for risk variables within each demographic factor. Contrary to risk variables, differences were observed within Age, Experience, Job Level, Job security, Local Traveler, and Union Status for the Average Hazard Identification. This relationship may be used to improve occupational safety. Education and Length of Service were among the demographic factors that showed a relationship with test score. In most cases, the expert panel and the survey participants had the same perceptions about the impact of personal variables, risk factors, and hazard identification on the safety performance.

Finally, the researcher compared the ranking of risk scenarios based on unit risk between OSHA records and survey participant responses. A moderate correlation was found between them.

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Framework for Assessing the Potential Safety Performance of Construction Mechanical and Electrical Field Employees

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Ali Moghaddam Vahed

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APPROVED:

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I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Ali Moghaddam Vahed, Author

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1. Introduction

Although construction worker safety has improved since establishment of the Occupational Safety and Health Administration (OSHA), it has not seen any significant improvement in the past decade. The industry has understood that even with safety management systems in place, incidents can still happen. It is apparent through research that field employees are ultimately the workers making decisions regarding the actions taken in the field, thus, rendering them as one of the key elements of safety on job sites. However, most of the safety assessment tools available for contractors are focused at the project level. When it comes to the workers, contractors have a limited number of tools available, such as behavior observations, to make safety assessments.

The primary objective of this thesis was to create an assessment tool for construction companies that focus on individual attributes of the person regardless of the site and work conditions. This tool will ultimately provide contractors with measurable criteria that can be used to correlate their incident trends. In order to achieve this capability, a tool based on personal factors, safety knowledge, hazard identification, and risk perception of activities was created. This

research also provided an opportunity to investigate the relationship between each of these factors and the different demographic groups in the construction industry.

1.1 Research Questions

The following research questions were established to guide the study and achieve the research objective mentioned above:

1. Are there comprehensive commercial or academic tools available to assess the expected safety performance level of current and prospective field employees?
2. What are the personal factors that influence a worker's safety regardless of outside conditions?
3. What are the personal demographic attributes that affect a worker's safety?
4. How can hazard identification and risk perception of employees be objectively evaluated?
5. What are the frequency and probability of incident causes for specialty trade contractors?
6. Are there any correlations between safety knowledge, hazard identification, and risk perception of employees?

7. Do personal demographic factors affect the safety knowledge, hazard identification, and risk perception of employees?
8. Do workers in the construction industry have a higher or lower risk perception of activities compared to the actual risk of injuries recorded by OSHA?

1.2 Organization of the Thesis

In this thesis a section-subsection formatting organization was used. The thesis has seven sections and the following describes each section briefly:

- Section 1 - Introduction
    - The research topic is presented and research questions are discussed.
- Section 2 – Literature Review
    - A comprehensive review of the related literature was conducted as part of the research study and is presented in this section. Injury statistics in the construction industry are presented, followed by the history of OSHA and other occupational safety movements. Then, safety assessment tools currently available commercially or academically in

the construction industry is presented and reviewed. Consequently, the research gaps and need for the current study are demonstrated.

- Section 3 – Methodology
    - The research methodology utilized to conduct the study is shown in this section. Development of surveys, data collection, and the expert panel created for the study are discussed.
- Section 4 – Results
    - This section presents the responses and data obtained from the surveys. Data processing and preparation for the analysis is shown. Furthermore, the data obtained from OSHA is presented and prepared for the comparison with the survey responses.
- Section 5 – Analysis and Discussion
    - In this section, the analyses of the obtained data and the results are discussed.
- Conclusion

- This section presents the conclusions that can be drawn from the research. Moreover, limitations and future recommendations are given as well.

A process flowchart for this research is presented in Figure 1.1.

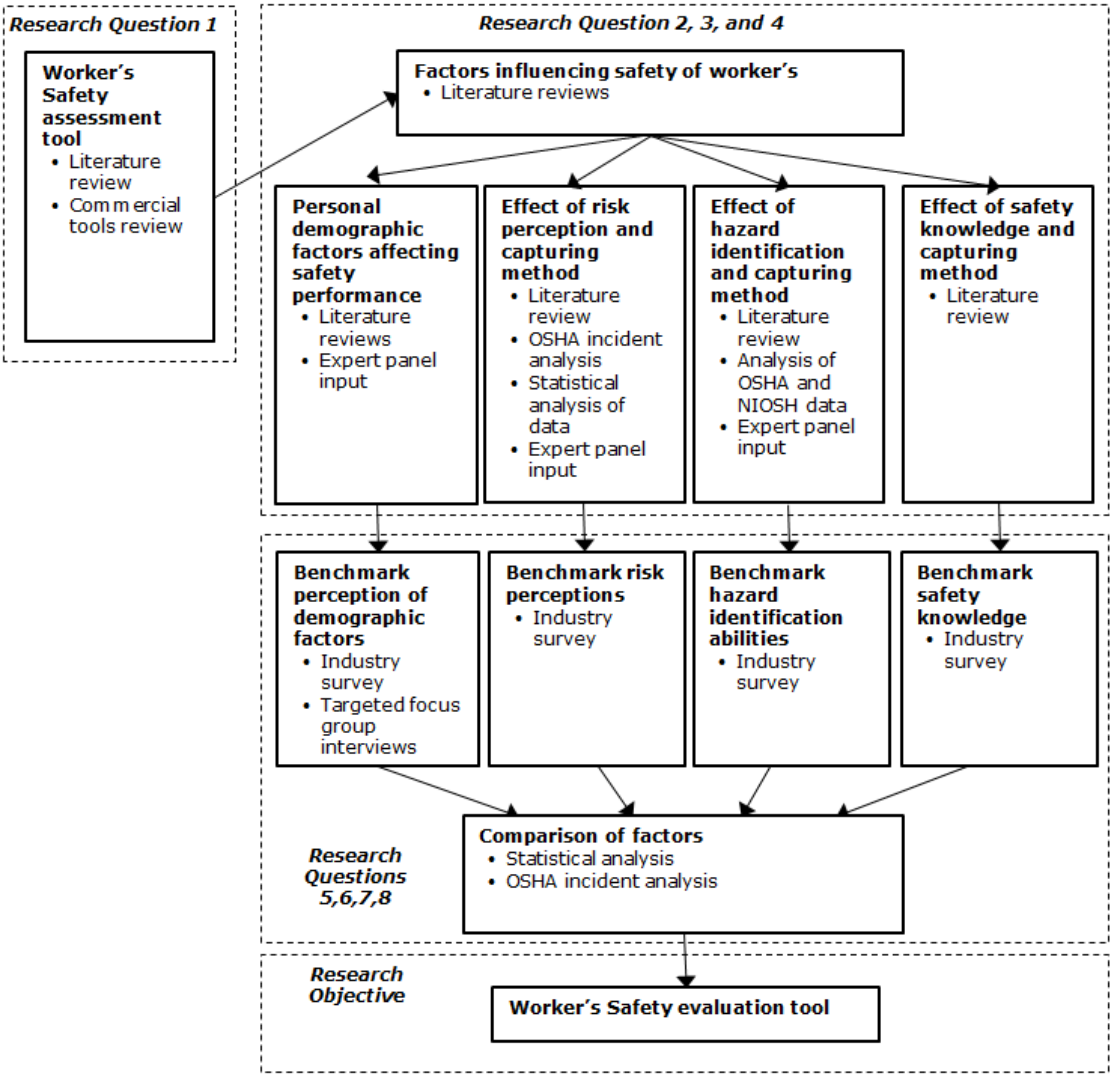

Figure 1.1 Research Process Flowchart

2 Literature Review

Research on construction safety has been conducted in many different areas. Prevention through design (e.g., Gambatese et al. 2014), impact of regulations on safety (e.g., Mohan and Niles 2002), responsibility of the different stakeholders in safety (e.g., Huang and Hinze 2006), safety behavior (e.g., Tam and Fung 2011), and safety risk (e.g., Hallowell and Gambatese 2009) are examples of various research areas in construction safety management.

The goal of this section is to answer the first research question presented in the Introduction to meet the research objectives: "1. Are there comprehensive commercial or academic tools available to assess the expected safety performance level of current and prospective field employees?"

In order to answer this question, a comprehensive literature review of academic and commercial sources was conducted. For commercially available literature, a general search of the Internet with keywords such as safety assessment tool, worker's safety assessment tools, safety evaluation tool, construction safety assessment, evaluating workers safety assessment, measuring worker's safety, and safety measurement tool was conducted. Moreover, the author asked safety professionals who are personal contacts of the author about

available tools that they know of which match the goals of this study. The author then further investigated those tools identified and suggested. In the academic literature, the above-mentioned keywords were used to search in the following databases and search tools:

- Engineering Index (Compendex), which covers a variety of engineering fields
- Web of Science (Science Citation Index, SCI), which is a multidisciplinary database
- American Society of Civil Engineers (ASCE) Library
- Oregon State University Library "1Search"
- Google
- Construction safety related books (e.g., Construction Safety by Hinze 2006)

Furthermore, these searches resulted in finding articles and publications in different journals such as the ASCE Journal of Construction Engineering and Management, ASSE's Professional Safety, Building and Environment, Expert Systems with Application, etc.

The literature review is organized to first describe the incident statistics in the construction industry in order to emphasize the need to focus on improving safety. Next, the history of safety in the

workplace and regulatory bodies are explained, as these regulatory organizations are used as a baseline throughout the current research. This literature is then followed by a summary of related research from both academic and commercial perspectives. Lastly, the research gaps and need are discussed to accentuate the importance of the current study.

The goal of this review is to identify our current understanding of the research topic and the construction safety assessment tools, and determine where additional research is needed.

2.1 Construction Industry Injuries and Fatalities

The construction industry has been identified as one of the high risk industries in the US and around the world. Although there has been extensive focus on construction safety, construction accounted for 16.5% to 22.2% of the total number of fatalities in all industries from 2003 to 2011 (Figure 2.1). Figure 2.1 illustrates that the percentage of fatalities in construction has decreased during the past decade. Despite this fact, construction still remains as one of the top five high fatality industries. As can be seen in Figure 2.2, the construction industry has the fourth highest fatal work injury rate, albeit it ranked second in the number of fatalities (Figure 2.3). In the non-fatal

category, the construction industry has had high injury rates and regularly has one of the six highest injury incident rates among private industry divisions as shown in Figure 2.4 (OSHA 2013a).

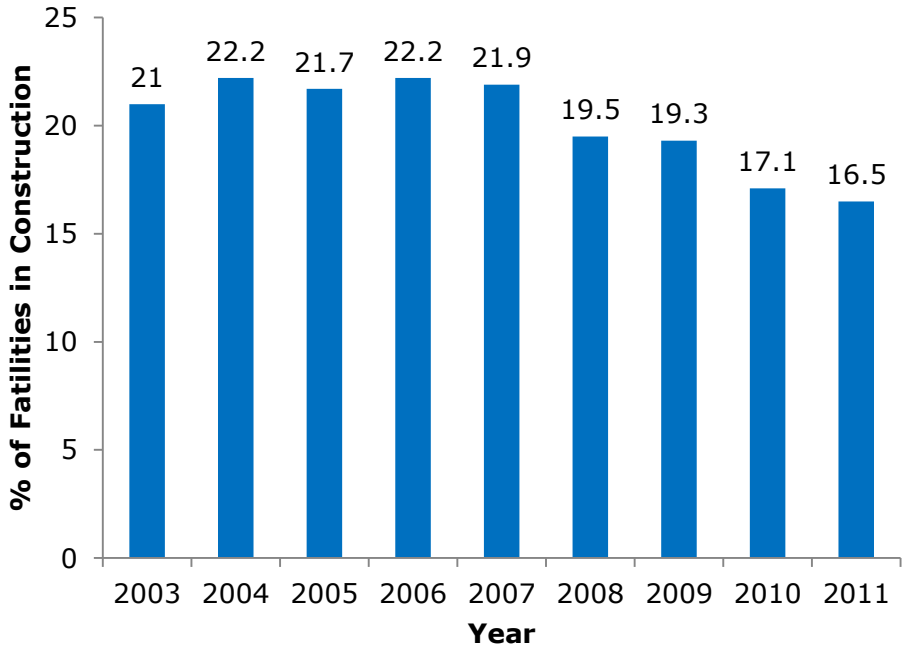

Figure 2.1Percentage of fatalities in the construction industry compared with all industries (OSHA 2013a)

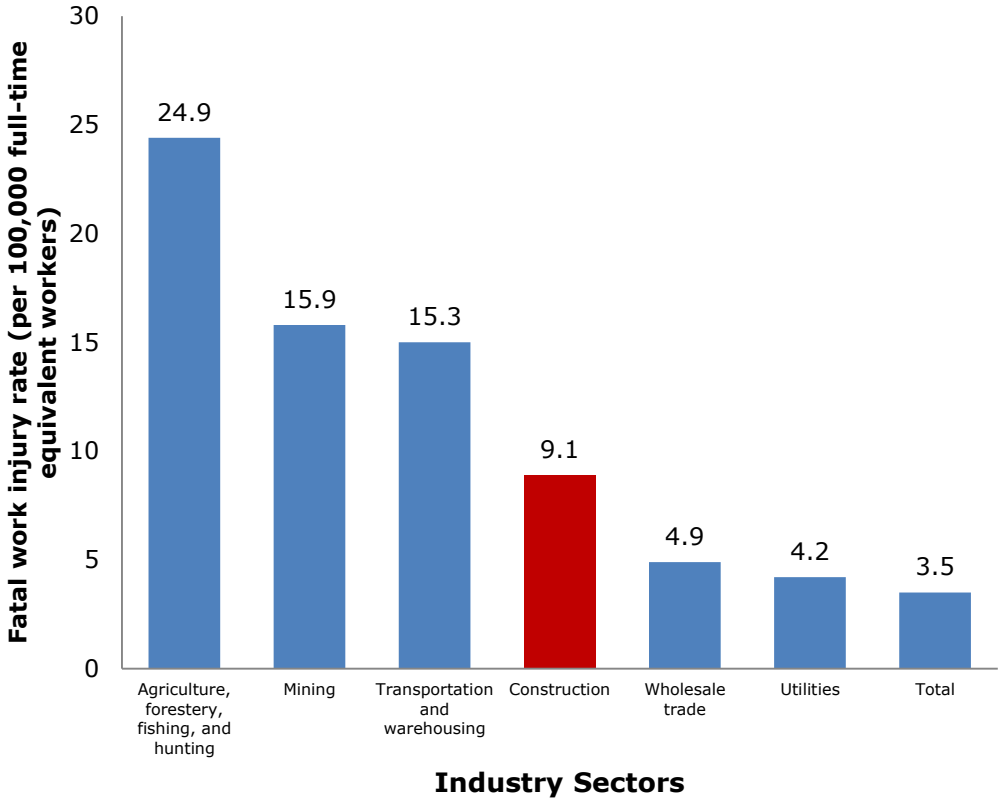

Figure 2.2 Comparison of fatality rates among different industry sectors in 2011 (OSHA 2013a)

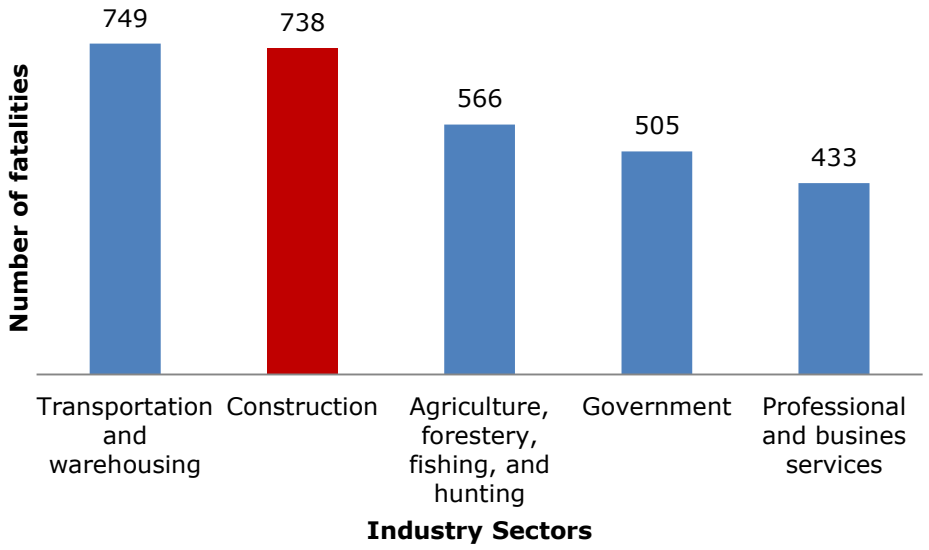

Figure 2.3 Comparison of fatalities among different industry sectors in 2011 (OSHA 2013a)

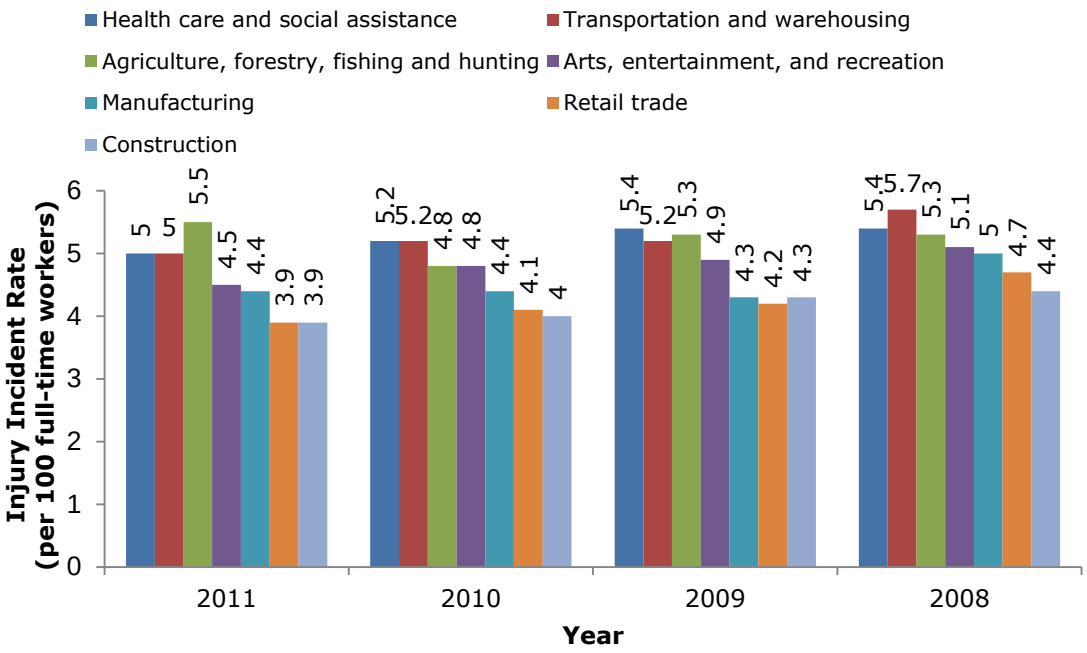

Figure 2.4 Injury incident rate in different private industry sectors (OSHA 2013a)

These statistics reveal the need for more emphasis on safety and finding ways to reduce fatalities in the construction industry. From the industry's perspective, safety has gained attention following the Occupational Safety and Health (OSH) Act, and since then, many tools and controlling measures have been developed. There has also been much academic research in the safety field to examine and develop ways to enhance construction worker safety.

2.2 History of Occupational Safety

In the industrial revolution era, employees bore the responsibility for their injuries due to the following reasons: employees were aware of the hazardous nature of jobs, the worker's actions contributed to the incident, and the employer was not involved in the precipitation of the incident. These reasons are known in common law sense as assumption of risk, contributory negligence, and the fellow worker doctrine. In the early twentieth century, these laws were eventually augmented with worker's compensation laws that placed liability for worker injuries on employers (Hinze 2006).

The first legislation regarding occupational health and safety in the United States goes back to 1877 when the State of Massachusetts passed a law requiring the guarding of equipment and fire exits in factories. Detailed studies on occupational injury and fatality incidents were conducted and first published by the Bureau of Labor in 1903. The Bureau of Labor Standards, founded in 1934, was the first federal agency created to mainly endorse occupational health and safety for American workers. The Occupational Safety and Health Administration (OSHA) came to life on April 28, 1971 when the Occupational Safety and Health Act (OSH Act) became effective. The OSH Act was signed into law on December 29, 1970, after a century of endeavors to

improve occupational safety. Two other independent agencies along with OSHA were established with the passing of the OSH Act: the National Institute for Occupational Safety and Health (NIOSH) and the Occupational Safety and Health Review Commission, which are the research and the administrative trial and appellate review entities, respectively. OSHA focused on five industries in the early years: marine cargo handling, sheet metal and roof work, the meat products industry, transportation equipment, and wood products (OSHA 2009).

Since the signing of the OSH Act in 1970 until 2009, occupational fatalities have reduced by approximately 69% and serious injuries reduced by approximately 67% (OSHA 2013c).

2.3 Safety Assessments

This part provides reviews of the available assessment tools in both academic and industrial fields. The following review presents the assessment tools.

2.3.1 Industry Perspective

The Occupational Safety and Health Administration (OSHA) is the regulatory organization for safety in construction. OSHA determines and enforces the minimum means and methods required for ensuring

safety of workers on construction sites, e.g., 29 CFR 1926 Safety and Health Regulations for Construction. All construction companies must adhere to the regulations. Most of companies consider the OSHA regulations as the baseline (i.e., the minimum requirements). However, regarding safety assessment tools, OSHA only provides sets of questions to verify whether an employer is meeting the minimum safety requirements. The following discussion enumerates and describes several assessment tools that are currently utilized by the construction industry. The researcher used verbal interviews with industry professionals (safety managers, safety engineers, risk and safety directors, risk managers, project managers, and project engineers who are personal contacts of the researcher), and the expert panel (described in section 3.1), and a web search, to identify the tools.

- OSHA

OSHA states its mission as providing safe work environments for employees by setting safety standards and providing means and methods in this direction (OSHA 2013c). According to OSHA (2013b), there are three methods for assessing the effectiveness of safety and health programs; these are document checking, interviews, and checking the site conditions for hazards. OSHA monitors these three

methods in different aspects of safety programs such as leadership and participation, hazard prevention, safety training, and site analysis. Lists of these questions are available online for companies to view (OSHA 2013b). A sample of these questions is given below for more clarification (adopted from OSHA 2013b):

"ASSIGNMENT OF RESPONSIBILITY" in leadership and participation section:

1. Documentation

Are responsibilities written out so that they can be clearly understood?

2. Interviews

Do employees understand their own responsibilities and those of others?

3. Site Conditions and Root Causes of Hazards

Are hazards caused in part because no one was assigned the responsibility to control or prevent them?

Are hazards allowed to exist in part because someone in management did not have the clear responsibility to hold a lower-level manager or supervisor accountable for carrying out assigned responsibilities?

From these questions it is derived that the purpose is to provide a checklist for safety evaluators to assess the overall safety of construction work. The questions are not worker specific. It should be noted that OSHA provides guidelines for safety procedures. However, the guidelines are only knowledge-based and do not address other factors that affect the safety of individual workers such as behaviors, risk taking, etc.

- ConstructSecure

Developed by the Environmental Safety and Health Department of Harvard University, this tool was initially created for the construction purposes of the university as a means to evaluate the safety performance of bidding contractors. Due to its success, it is now commercially available as a tool for other companies as well. This tool has some well-known clients such as Skanska, Turner, MIT, and Harvard (ConstructSecure 2013a).

ConstructSecure utilizes a company's Experience Modification Rating (EMR) along with the company's safety documents, historical data, OSHA citations, insurance documentation, and the safety management system of subs in order to produce a safety rating of the potential contractor. An example of the output of this tool is shown in Appendix A (ConstructSecure 2013a, b).

- SafetyInfo

As a safety oriented company, SafetyInfo represents a typical safety provider company in this field. SafetyInfo provides many services to other companies regarding safety. This company uses the OSHA guidelines and regulations to assess safety on a job site. For instance, questions are asked regarding the OSHA ladder regulations and how much a ladder should be extended on top or whether it needs to be tied off or not (SafetyInfo 2013). This company also provides safety quizzes for workers in order to assess their knowledge regarding safety procedures. For example, a simple question might ask about the evacuation actions to be taken in case of an emergency (SafetyInfo 2013). A sample quiz adopted from SafetyInfo (2013) is available in Appendix B.

- ISNetworld

ISNetworld is a contractor management tool. It assesses contractors based on the following criteria: safety, insurance, quality, and regulatory information. ISNetworld provides a streamlined tool for hiring clients to assure their performance according to any of the mentioned criteria. This assessment tool benefits hiring clients such as owners in the construction industry by helping to make sure contractors meet and maintain the standards required by owner and

regulations. ISNetworld is based on a database used by the ISN company to keep track of the information required by hiring clients. The data in the database is provided by individual contractors seeking to work with the clients. Management system questionnaires, health and safety programs, injury records, audit results, insurance certificates, and workers' compensation and insurance rates are some of the information that are tracked for each contractor. This tool also provides some analysis based on safety data and statistics (e.g., recordable incident rate) for clients and contractors such as benchmarking in the industry and tracking site and company statistics (ISN 2014).

- PICS

PICS, which is also a contractor assessment tool, focusses more on supply chain management. PICS helps owners and hiring clients to implement and maintain a simplified prequalification process. PICS uses an audit system to assess a contractor's safety performance. PICS covers areas such as policy and procedures, documentation, training, equipment inspections, and field audits. PICS is an assessment tool that is useful for contractors. It focuses on identifying the gaps that contractors have in comparison to the client's and owner's needs (PICS 2014).

- PEC

PEC is also a contractor assessment tool similar to some of the above-mentioned tools. This particular tool uses a standardized safety questionnaire to gather a contractor's safety-related information. It also gathers safety documentation such as OSHA logs, EMR information, safety manuals, etc. This tool provides a customized ranking and scoring ability for the client to assess the contractor's safety performance based on the client's customized criteria (PEC 2014).

- Predictive Solutions

Unlike the aforementioned tools, Predictive Solutions takes a different approach to assessing safety performance for contractors and owners. Predictive Solutions uses observation data and audits to predict the possibility of an injury. This tool uses previous incident and observation data (about a hundred million data points) to find the relationships between observation data and incidents. These observations include behavioral observations such as at-risk behaviors, construction site data (audits and inspection), job hazard analysis, risk management plan, incident analysis, and accountability (Predictive Solutions 2014).

- Other industry tools

Other than the tools discussed above, most companies use some sort of auditing and inspections to assess safety on their job sites. The researcher used some of these tools, which were usually developed in-house based on recommendations from OSHA, during his internships with two different companies to assess the safety of the jobsite, contractors, and sub-contractors. These tools, such as Key Performance Indicators (KPI) and weekly jobsite audits, focus on safety elements of jobsites to assure safe working conditions. Some audit tools like the KPI audit are utilized by construction companies which analyze the sites much more meticulously than weekly inspections to ensure all elements of the company's safety policy are met on the jobsites. Copies of these audit tools are available in Appendix C.

2.3.2 Academic Perspective

Much research has been published in the literature regarding safety assessments. The literature can be organized into three categories: assessing safety culture, assessing safety climate, and other safety assessments. A review of the literature in these categories that is relevant to the present study is provided below.

2.3.2.1 Safety Culture Assessment

The concept of safety culture has existed since the 1980s (Kun et al. 2011). There have been many definitions of safety culture developed and discussed in the literature (Boughaba et al. 2014). The multitude of definitions is due to the complex and intangible aspects of safety culture (Lee and Harrison 2000). For instance, the definition of safety culture presented by The Advisory Committee on the Safety of Nuclear Installations (ACSNI) that was adopted for previous research (Lee and Harrison 2000) is:

> "The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to and the style and proficiency of an organization's health and safety management."

Due to the implicit and broad definitions of safety culture, measuring safety culture has been a complex task. This section summarizes some of the safety assessments that were developed in the literature.

Lee and Harrison (2000) surveyed employees of three nuclear power plants with a twenty-item questionnaire. This survey covered the following eight domains: confidence in safety, contractors, job satisfaction, participation, risk, safety rules, stress, and training. The research showed that the survey instrument could be practically implemented to assess the safety culture of the sites.

Grote (2007) investigated the role of safety culture assessment with regards to organizational uncertainty management. Grote (2007) suggested that a pre-assessment of methods used to manage uncertainties and their fitness to types of encountered uncertainties should be conducted. This pre-assessment influences the function and significance of safety culture assessment.

A safety assessment tool for petroleum organizations was developed by Kun et al. (2013) using a fuzzy model. The assessment encompassed safety material, behavior, system, belief, and persistence, and openness of safety in the assessed enterprise. Using the fuzzy model, the cultures of three companies were assessed and

ranked. Similar to the above-mentioned method, Kun et al. (2011) used indicators and an index system to assess the safety culture of coal mines with a fuzzy model. The six main indicators in this system incorporated the following areas: management participation, organization commitment, education and training, rewards and punishment system, and reporting system.

Boughaba et al. (2014) examined the correlation between safety culture and safety performance in petrochemical companies. A survey was conducted as part of this research to measure the safety culture. The survey focused on the following elements: safety policies, safety rules and procedures, incentives, safety managers' attitude and behavior, training, communication, and employees' involvement.

Molenaar et al. (2009) developed a framework to quantify a company's safety culture and its relationship to the safety performance of the company. In order to assess safety culture, the researchers used a questionnaire that focused on safety commitment, accountability, incentives, disincentives, and sub-contractor involvement. These safety culture factors were identified as indicators of a construction company's safety performance.

2.3.2.2 Safety Climate Assessment

In this section, a review of the literature that focuses on assessing safety climate in work places is described. Safety climate was presented by Zohar (1980) as a shared perception of the employees concerning the value of safety in an organization (Huang et al. 2007). However, similar to safety culture, safety climate has been defined using a variety of the definitions in the literature, and in some cases it even overlaps with safety culture (Milijic et al. 2014), thus rendering the measurement of the safety climate difficult.

Milijic et al. (2014) compared the safety climate of different industries in Serbia. This research also measured the correlation between a worker's personal demographics and safety climate. To compare the safety climates among industries and different demographic groups, a questionnaire was developed and used to assess and quantify safety climate. The questionnaire focused on the following seven key indicators: safety awareness and competency, safety communication, organizational environment, management support, risk judgment and management reaction, safety precautions and accident prevention, and safety training.

Brondino et al. (2012) created a model to demonstrate the correlations between different levels of safety climate (Organizational,

Supervisor, Co-workers) and safety performance. Each of the climate levels was assessed by using a questionnaire based on a seven point scale. The questionnaires were organized according to different focus areas. The safety climate questionnaire for an *organization* targets safety communication, training, values, and systems. The *supervisor's* safety climate questionnaire focuses on two domains: supervisor efforts to improve safety, and supervisor reactions to worker behaviors. Lastly, the safety climate of *co-workers* questionnaire assesses four different areas: safety communication, mentoring, values, and systems.

A research study was conducted by Haung et al. (2007) to examine the correlations between work shift, perception of injury risk, injury frequency of the company, and safety climate. In order to assess the safety climate of the company, the researchers used a questionnaire containing questions utilizing a Likert scale. The survey focused on the following domains: management commitment to safety, quality of return-to-work policies and post-injury administration, and safety training. Responses from employees were averaged to quantify the safety climate of the company.

The Nordic Safety Climate Questionnaire (NOSACQ-50) was developed to assess and measure safety climate at different levels

within an organization or an industry, such as a measurement of climate between different groups within a company, or the differences of climates between industries. The assessment tool consisted of 50 questions that were focused on two areas: perceptions of employees on management and on workers. The perception questionnaire for the first domain consisted of management safety priority, commitment, competence, safety empowerment, and safety justice. The second area of the perception survey consisted of employees' safety commitment, priority, communication, learning, and trust in co-workers' safety competence and the effectiveness of safety systems (Kines et al. 2010).

2.3.2.3 Other Assessment Tools

Ng et al. (2005) created a framework to assess the safety performance of construction companies. Using this framework the researchers assessed the safety performance at two levels, project level and organization level, and calculated an overall company safety performance score by combining the scores from each level. At the project level, the following seven factors were included: project level management commitment, management of hazards, implementation, training and information, emergency planning, incident management,

and safety audits and reviews. At the organization level, the framework measures the following six factors: commitment of management, training, subcontractor management, safety audits and reviews, incident records, and safety regulations. As the first step to create the framework, these factors were ranked for each level. For the second step, sub-factors were developed and their level of importance was determined through a survey. The assessment model consisted of utilizing weighted scores to determine the performance index. Consequently, the final safety score was calculated by adding all of the performance index scores of the factors at each level.

Beriha et al. (2012) incorporated a fuzzy logic approach in assessing the safety performance of industries. In this method, expenses related to different aspects of safety in each industry were focused on in comparison to the injury incident rate. The expenses were enumerated in the following groups: health care, safety training, upgrading health and safety tools and processes, and safety equipment. The output for the fuzzy model was accident rates. The accidents were organized into the following five categories: no disability-no lost day, no disability-lost day, temporary disability, permanent partial disability, and permanent full disability or fatality. The study resulted in a tool created to help industry leaders make

more informed decisions in regards to expenses in various aspects and their correlation to incidents.

Li et al. (2011) created a visual interactive safety assessment tool to assess employees. This tool was used to evaluate an employee's knowledge of unsafe conditions, unsafe work behaviors, and unsafe work methods in order to track down an employee's deficiencies related to safety knowledge. In this tool a virtual environment was created that allowed users to be assessed in a virtual environment based on their choices. When the individual taking the test in the virtual environment gets a certain weighted score of wrong answers, they fail the test. The researchers in this study weighted each question only based on the severity of the injury addressed in the question: minor injury, serious injury, and fatality.

Hao and Lili (2010) developed a safety assessment tool for construction sites using an index system and a fuzzy and artificial neural network. In order to evaluate the performance of a project site with regards to safety, an index system was developed that consisted of six primary factors and 25 sub-factors. The primary factors included in this study were: safety production, safety management on site, education publicity, life and health, labor protection, and sub-contractor management.

A hybrid assessment tool was developed by Zhou et al. (2014) for accidents on high risk hydropower construction projects. This assessment tool was comprehensive because it incorporated human factors and risk behaviors in the model using four different layers involved in construction accidents: enterprise influence, safety management, field work related factors, and construction personnel unsafe acts. These layers were then indexed to 18 sub-factors in total. The model created utilized the decision-making trail and evaluation laboratory method, and the analytic network process, to weight the indices.

2.4 Research Gaps and Needs

As presented in the preceding sections, previous safety studies and commercial tools for safety assessments have primarily focused on creating a system to evaluate the safety performance of companies at the organizational and project levels. Although some of these tools has been developed and are used commercially, very few studies (Li et al. 2011; Zhou et al. 2014) have been conducted to develop a system to comprehensively assess individual employees. Zhou et al. (2014) placed emphasis on a comprehensive assessment tool since all of the factors were correlated together and altering one factor could result in the modification of others. Li et al. (2011) discussed the difficulty of managing the safety of all workers simultaneously with limited contractor staff to do so, thus relying on workers as the last resort to manage safety.

The present research study focuses on developing a framework to assess the safety performance of field employees comprehensively. The framework will serve construction companies as an enhanced tool to evaluate their employees with regards to safety. In the construction industry, contractors often have limited information regarding safety prior to the start of a project (Li et al. 2011). This framework will address the factors that will affect an individual's safety performance

regardless of the project or external conditions (for instance, management or peer pressure), giving more information to the employer before the start of the project, and before the worker begins working on the project. As will be discussed in the methodology section, there have been individual research studies on some of these factors; however, no study has been conducted that considers the factors simultaneously. The present research study fills the gap by considering all of the internal factors in one model and provides a quantitative assessment tool to capture these factors.

3 Research Methodology

The objective of this section is to answer the following research questions:

- What are the personal factors that influence a worker's safety regardless of outside conditions? (Question 2)
- What are the personal demographic attributes that affect a worker's safety? (Question 3)
- How can hazard identification and risk perception of employees be objectively evaluated? (Question 4)

In order to answer these questions, a literature review targeting each of the factor categories was conducted, and a survey was conducted to capture the required information from the workers. The process to conduct the survey to assess the safety performance of the employees is thoroughly explained in this chapter. The flowchart shown in Figure 3.1 summarizes the process and flow of the research.

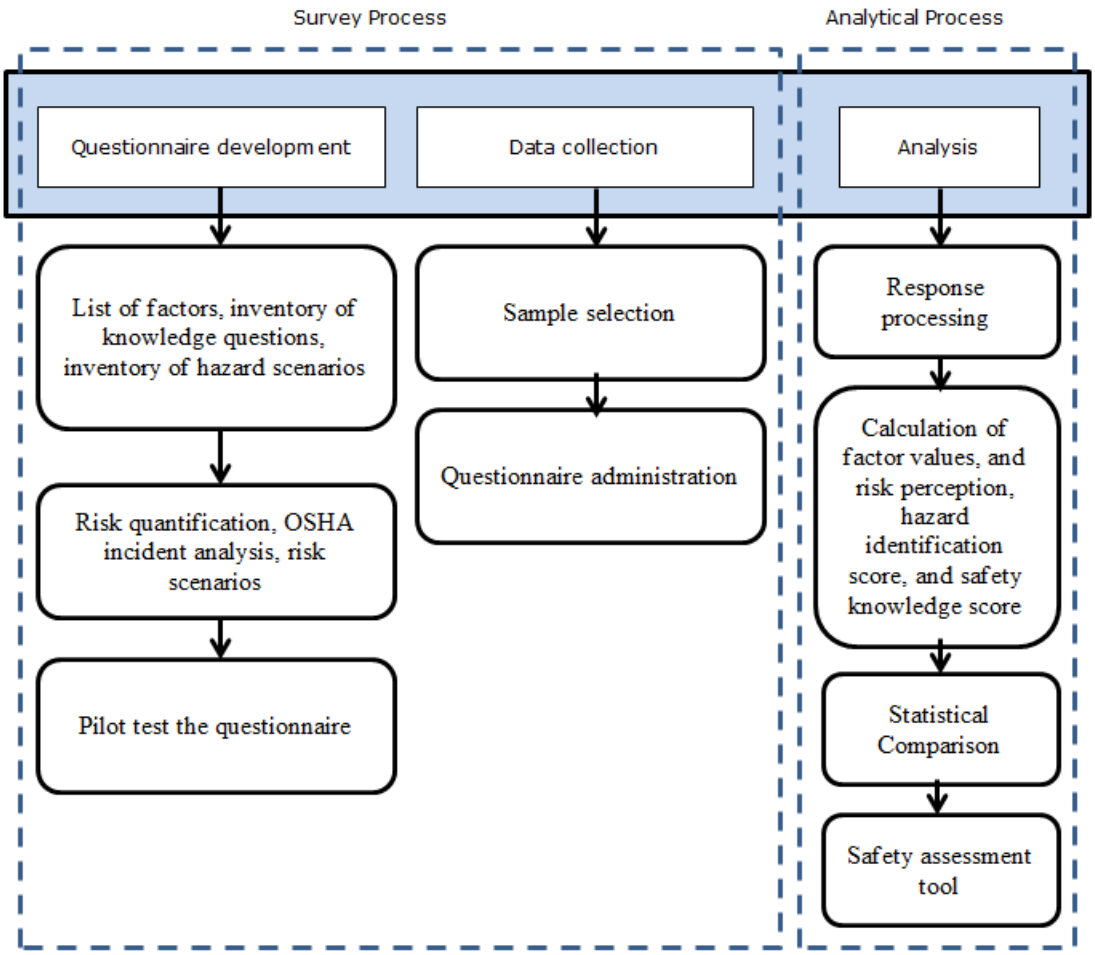

Figure 3.1 Methodology process and flow

3.1 Expert Panel

An expert panel was included in this research in order to incorporate professional opinion and experience when designing the survey questionnaire. Also, the expert panel's responses to the survey questionnaire were compared with those of the field employees and with the analysis of OSHA records. The expert panel consisted of four safety managers, one safety director, one coordinator, and one high level manager involved with safety committees in Pacific Northwest companies with whom the researcher had personal contact. Since the tool is developed for mechanical and electrical trades, panel members were chosen based on their experience with mechanical and electrical trades and their employment with several companies on different project types (e.g. commercial buildings, residential, industrial, etc.) related to mechanical and electrical field. One of the safety managers were selected from a general contractor in order to obtain input from a general contractor's perspective as well. The rest of the panel members were selected from a design-build operate and maintain company in the mechanical and electrical trade. Although it might be argued that selecting majority of expert panel from same company could create bias, the current research is focused on factors with regards to individuals and not the external factors. Moreover, the

members have been working with different companies in the Pacific Northwest with a variety of backgrounds (trade field employee, loss control manager, etc.). Thus, the expert panel selected seems adequate for the purposes of this research.

The following questions were asked of the expert panel with regards to their background:

1. Number of years working in the construction industry
2. Number of years working in safety
3. Certifications in safety and/or construction
4. Types of companies worked for (GC, specialty, etc.)
5. Types of work their companies have completed (mechanical, electrical, etc.)
6. Types of projects on which they have worked (commercial, residential, industrial, manufacturing, etc.)
7. Have you supervised workers who are in the field and exposed to safety hazards?

Table 3.1 presents a summary of the responses to the questions from the expert panel.

Table 3.1 Expert panel's responses

	Construction Experience	Safety Experience	Certifications	Type of Company	Types of Work	Types of Projects	Supervised Workers	Current Role
1	6 years	11 years	CHST, CET	Prime contractor	HVAC, DBOM	Commercial, Manufacturing	Yes	Safety manager
2	30 years	15 years	Train the trainer OSHA	GC, prime contractor	Facility management services	Commercial, R&D, data centers, manufacturing	Yes	Safety manager
3	16 years	10 years	B.Sc. in Safety and Health Management, CHST	GC and sub-contractors	Mechanical, electrical, plumbing	Industrial surface mines, commercial construction, health care, manufacturing	yes	Regional safety manager
4	23 years	8 years	OSHA 510	DBOM	Mechanical, electrical, data, plumbing	Just management experience	Yes	Safety director
5	25	15 years	CSP	GC	General contractor	Commercial, residential	Yes	Safety manager
6	20	3	OSHA 10	Sub-contractor	Mechanical, electrical, plumbing	Commercial, manufacturing	Yes	coordinator
7	35	3	OSHA 30	Prime contractor	Mechanical, electrical, plumbing	Commercial, manufacturing	Yes	Operations Managers

3.2 Influence of Personal Factors on Safety

The objective of this section is to answer research question #4 where the personal factors that affect the safety of the workers are determined. In order to determine these factors, a literature review was initially conducted, which is described below. Following the discussion of the factors, the process to create the survey used to capture the influence of each of the factors is discussed.

Bosak et al. (2013) studied the correlation of risk behavior with factors such as age, function (maintenance and production), contract type (permanent and temporary), and service length in a chemical manufacturing organization in South Africa. Although there was a significant negative correlation of age with risk behavior, and significant positive correlation of function with risk behavior, these correlations were small (-0.09 and 0.12). However, when the researchers used multiple regression models including management commitment to safety, safety priority on plant, and pressure for production and their interactions as predictor variables, and age, function, contract type, and service length as control variables, with risk behavior as the dependent variable, they found a significant positive standardized partial regression coefficient (0.13) in all models.

Contact type was only significant in one model (0.08). When the model included only the control variables, the regression coefficients were as follows: age (-0.16), function (0.10), and service length (0.15).

Siu et al. (2003) investigated the relationship of age with safety performance (accident rates and occupational injuries) among Hong Kong construction workers (n=344, composed of 366 male and 8 female workers) using a Chinese version of the Safety Attitude Questionnaire. Age, age squared, and tenure were entered in the regression model, using safety performance (accident rates and occupational injuries) as the dependent variable, to investigate the effects of tenure and age. Accident rates were not associated with age. However, two safety attitudes (housekeeping and safety equipment; and management/supervisor encouragement and support) were related to age, and older workers had more positive attitudes towards safety. When age, age squared, and tenure were entered in the regression model, using safety performance (accident rates and occupational injuries) as the dependent variable, the effects of tenure and age were not significant. On the other hand, a curvilinear relationship was observed between age and occupational injuries when 12 safety attitude subscales were included in the model (Hierarchical

multiple regression procedure). The occupational injuries increased with age at first and then declined making a U-shaped curve. Furthermore, after controlling age and tenure in the multiple regression model, some attitude scales (pressure from management/supervisor, team leader practice, and team leader knowledge with the safety system for the accident rates; and level of safe working behavior for the occupational injuries) predicted safety performance.

A study was carried out by Vinodkumar and Bhasi (2009) to determine the factors affecting the safety climate in the chemical industry in Kerala, India. In the study, a questionnaire was distributed among 2,536 employers of eight major accident hazard industrial units. The population consisted of workers and first line supervisors at the lowest end of the management personnel. One objective of the study was to assess the relationship of safety climate with personal characteristics such as age, experience, qualification, and job category. The researchers grouped the workers based on age (up to 35 years, between 36 and 50, and above 50 years), education level (up to 10th standard, above 10th standard and up to degree, and degree and above), work experience (10 years, 11-20 years, and above 20 years), and job category (supervisory staff and workmen).

One way analysis of variance (ANOVA) showed significant differences among age groups and also among experience groups for the employees' perception of four safety climate factors (management commitment and actions for safety, workers' knowledge and compliance to safety, workers' participation and commitment to safety, and risk justification). Significant differences were found among qualification groups for all factors (except safeness of work environment and risk justification), and between two types of jobs for all factors (except workers' participation and commitment to safety and risk justification). The results showed that factor scores reduced at first and then increased with age and experience. Age and experience were highly correlated ($r= 0.86$, $p<0.01$). Vinodkumar and Bhasi stated that "it is not possible to say whether it is the age that influences the factor scores or the length of experience in the company". The younger and less experienced group had higher factor scores than the middle group. The researchers indicated that the younger group and those with shorter tenure behave positively toward safety attitudes. Furthermore, the improvement observed in the older group can be attributed to their experience. There was a positive relationship between factor scores and qualification because the highly qualified workers may be more responsive to safety rules and

regulations. Finally, supervisors had better scores than the workmen because the supervisors enforce safety rules.

Zhou et al. (2008) conducted a survey of more than 4,700 employees in a large construction firm in China to establish a safety climate model based on a Bayesian network (BN) model. The analysis showed that safety climate factors may have a larger effect on safety behavior than personal experience factors. However, the researchers concluded that joint control of both safety climate factors and personal experience factors can be regarded as a more effective strategy.

Villanueva and Garcia (2011) conducted an analysis of data from the Spanish Social Security administration (Ministry of Labor) about occupational injuries registered in Spain in 2001 for different industries such as the construction, agriculture, and fishing sectors. The risk of a fatal accident was assessed with age and work shift time. In addition, the risk was evaluated for gender and also for contract type (temporary workers or permanent). Furthermore, the correlation between expected risk and lack of experience and training on safety behaviors was examined. The risk of a fatal accident increased with age and work shift time. Moreover, the risk was higher for males and also for temporary workers. However, because of the low number of women in the sample, the results related to gender were limited. In

addition, workers in the construction, agriculture, and fishing sectors were at higher risk. Increased risk related to inadequate experience and training on safety behaviors was one of the findings.

Feyer et al. (2001), Dimich-Ward et al. (2004), and the European Commission (2004) have also investigated the risk of fatal accidents in men compared to women. These studies showed an increased risk of fatal accident for men compared to women.

Fang et al. (2006) conducted a safety climate survey of employees of a construction company and its subcontractors in Hong Kong. The researchers obtained 4,719 records from 54 sites, and extracted 15 factors by means of factor analysis to explain the dimensions of safety climate. Further, the researchers carried out logistic regression to find out any relationship between safety climate and personal characteristics. A single composite indicator variable, called FSIALL, was used as the dependent variable by summing up the 15 standardized factor scores. However, the researchers changed the FSIALL variable to a dichotomous variable, called FACIALL, in order to use it in the binary logistic regression model. A FACIALL value of 1 was assigned to a good safety climate and a value of 0 indicated a poor safety climate. The relationship of safety climate to gender, marital status, education level, number of family members to support, safety

knowledge, drinking habits, direct employer, and individual safety behavior was investigated. This study revealed that people with more social responsibility (older, married, and children) had a better perception of safety climate. Regarding education level, lower education levels resulted in decreased perception of the safety climate. A drinking habit (alcoholic) was also found to affect perception of the safety climate negatively.

Using a survey questionnaire, Choudhary et al. (2009) conducted a safety climate survey on the construction sites of a leading construction company in Hong Kong and collected 1,120 valid responses from 22 construction projects. The personal characteristics analysis was a secondary and follow up step of the research. The factors investigated included worker age, marital status, and number of family members to support. Factor analysis showed that two factors, "management commitment and safety environment" and "inappropriate safety procedure and work practices", were significant predictors of workers' perceptions of safety performance. Moreover, it was found that perception of safety climate was more positive in older, married employees who had family members to support.

In a review of relevant research on successful occupational safety programs, Cohen (1977) investigated the workforce in

companies with better safety performance to identify characteristics that could have an influence on their safety profile. Employee turnover (decreased risk of job accidents because of new workers' lack of experience), marital status of workers, age of employees, and length of service were investigated in these companies. This research found companies that had older employees, employees who are married, employees having a longer length of service, and lower employee turnover rates had better safety performance.

Kunar and Bhattacherjee (2006) conducted a study on 164 coal miners in southern India and reported the important role of some occupational and individual factors in injury causation. The risk of injury was compared between workers who were and were not consuming alcohol. Moreover, the researchers investigated the effect of formal education of workers on risk of occupational injuries. Smoking habit was included in the research as Chau et al. (2002) have examined the role of smoking in injuries. This study concluded that risk of injury was greater for workers with alcoholic drinking habits. Moreover, it was found that not having formal education would increase the risk of injuries. Smoking habit was not related to injury. However, Chau et al. (2002) have emphasized the role of smoking in injuries.

Four separate studies were conducted by Tucker and Turner (2011) to develop and validate measures of workplace safety-related behaviors relevant to young workers. These behaviors were: considering quitting an unsafe job, speaking out regarding safety issues, adapting to dangerous conditions, neglecting worsening safety conditions, and compliance with safety policies. The analyses in these studies verified the reliability and validity of the abovementioned behaviors.

Sneddon et al. (2013) investigated the relationship of stress, fatigue with work situation awareness (WSA), and safety in offshore drilling crews of UK Continental Shelf (UKCS). To conduct the study the researchers used a self-report scale to measure WSA of 185 drilling personnel. Based on principal component analysis, four sub-scales of WSA (concentration, attention, anticipation, and distraction) were determined. WSA scores were compared between workers who had previously been involved in a work accident and those who had not had an accident. Stress, sleep disruption, and fatigue had negative and significant correlations with WSA. However, based on the regression analysis, only stress remained in the model as a predictor of WSA. Moreover, it was found that lower WSA scores were correlated with increased unsafe behaviors. Also, WSA scores of the workers who

had been involved in injury incidents were lower than for those who had not been involved in an incident.

Wu et al. (2007) studied the effect of individual factors on safety climate in university and college laboratories of Taiwan. The researchers distributed a self-administered questionnaire among employees of 100 universities and colleges. Multivariate analysis of variance was conducted to determine the effect of organizational category of ownership, the presence of a safety manager and safety committee, gender, age, job title, accident experience, job tenure, and safety training on the climate. Among individual factors, job tenure and work site did not influence safety climate significantly. There was a significant difference between male and female employees' perceptions regarding safety climate in emergency response. Males had stronger emergency response than females. Employees of various ages significantly differed in their perceptions regarding safety climate. There was significant difference in safety climate perception among employees of various job titles. Managers had a higher perception of safety climate than faculty and staff. A significant difference was observed among employees with several accident experiences. Employees who had not experienced an accident had a stronger perception of safety climate than employees who experienced an

accident. Finally, employee safety training level was found to be significant. The perceptions of employees having safety training were higher than the employees with no safety training.

Ferguson et al. (1984) investigated the relationship of personal characteristics and occupational factors with risks of accidental injury in naval environments. Age at enlistment, educational level, and mental ability were significantly related to risk of injury. The relationship of age with accidental injury was U-shaped. Personnel who were 21-25 years old had the lowest probability of injury. The 17 year old enlistees (mostly high school dropouts) had the highest risk followed by individuals above 25 years of age. An intermediate probability was obtained for the age of 18-20. Years of education and mental ability (General Classification Test Score) had negative relationships with risk of injury. The injury risk of personnel with less than high school education was twice as much as that of individuals with more than high school education. However, when these factors were considered jointly, only education had a significant effect on injuries. This means that injury risk was generally uniform within educational levels, suggesting the lack of major effect of mental group and age on observed differences in injury.

The relationship of gender, age, and experience with fatal injuries was investigated by Lin et al. (2008) based on 1,890 fatal injury reports in Taiwan. In this study, the researchers found that the fatality rate of males was eight times higher than females, and young males showed higher fatal injury rates than their female counterparts. Furthermore it was found that incidents resulting in a fatality were occurring more during the first year of employment.

Lombardi et al. (2009) determined the factors that influence the decision by workers in the manufacturing, construction, service, and retail industries of Massachusetts of whether to wear personal protective eyewear (PPE). Age and safety training were among the factors affecting the use of PPE.

Lastly, Shendell et al. (2013) studied the safety incidents among working minors in New Jersey. The researchers investigated injuries among male and their female counterparts in CTE programs/courses and cooperative education experiences. Age was also one of the factors evaluated in this study. The research results showed that males in CTE programs/courses and cooperative education experiences get injured more frequently than females. Moreover, the research found more injuries within the 16 years old and younger group than the older group.

A summary of the factors described above and the related research is shown in Table 3.2. These research studies are important to the present study as they help to create the list of personal factors that affect the safety of field employees.

Table 3.2 Personal and demographic factors investigated by previous research

Ref.	Age	Service length/tenure	experience	Education level	Gender	Temporary or permanent	Training	Marital status	Having dependents	Drinking Habits	Smoking Habits	Previous accident experience	Job title
Bosak et al. 2013	X	X											
Siu et al. 2003	X	X											
Vinodkumar and Bhasi 2009	X	X	X	X									
Villanueva and Garcia 2011			X		X	X	X						
Feyer et al. 2001					X								
Dimich-Ward et al. 2004					X								
European Commission 2004					X								
Fang et al. 2006	X							X	X	X			
Choudhary et al. 2009	X							X	X				
Cohen 1977	X	X	X					X					
Kunar and Bhattacherjee 2006				X						X	X		
Sneddon et al. 2013												X	
Wu et al. 2007	X	X			X		X					X	X
Ferguson et al. 1984	X			X									
Lin et al. 2008	X				X							X	
Lombardi et al. 2009	X						X						
Shendell et al. 2013	X				X								

3.2.1 Expert Panel's Review

After presenting the list of factors to the expert panel for their review and input, the following factors were suggested by the panel for further investigation:

3.2.1.1 Being Local or a Traveler

In some cases when multiple large projects are under construction for an extended period of time, the local union halls do not have enough tradespeople to support the many projects. Thus the union halls have to use trade workers from other states which are called travelers. Travelers may not be familiar with the local safety practices and safety culture in the area.

3.2.1.2 Being Part of a Labor Union or Non-union

Depending on the current work environment, in some cases both union members and non-union workers could be working on the same projects. The difference between a union employee, who receives specialized training and must meet certain knowledge and skill requirements in order to advance their level of employment, and a non-union employee was identified as a factor of interest by the panel.

The expert panel also suggested removing the following factors from the survey questionnaire due to the comfort level of employees and the potential lack of honesty when responding to those questions: race, smoking habits, and drinking habits.

For this section of the survey questionnaire, a five-point Likert scale ranging from Completely Disagree to Completely Agree was used to determine the influence of these factors on safety performance. Table 3.3 shows the questionnaire used in the survey.

Table 3.3 Personal factor questionnaire

In this part, the objective is to determine which personal attributes influence the safety performance of a worker. Using your experience and judgment, please indicate whether you agree or disagree with each statement.

Statement regarding influence of personal attributes on safety performance	Completely disagree	Disagree	Neutral	Agree	Completely agree
The **age** of an employee influences the employee's safety performance					
An employee's **gender** influences the employee's safety performance					
An employee's **marital status** influences the employee's safety performance					
Having dependents (e.g., children) influences an employee's safety performance					
An employee's level of **work experience** in the trade influences the employee's safety performance					
An employee's level of **education** influences the employee's safety performance					
An employee's **length of service with the company** influences the employee's safety performance					
Having more than one job influences an employee's safety performance					
An employee's safety performance is influenced by whether or not the employee **has experienced injuries that required more than first aid treatment in the past**					
An employee's safety performance is influenced by whether or not the employee **has observed injuries to other workers that required more than first aid treatment in the past**					
Having **formal safety training** like OSHA 10-hour training influences an employee's safety performance					
An employee's **perception of their job security** influences the employee's safety performance					
Being a **local worker or a traveler** influences an employee's safety performance					
Being a **member of a labor union** influences an employee's safety performance					
The **job level of the employee** (for example, apprentice, foreman, etc.) influences the employee's safety performance					

In the next part of the personal factors section of the survey questionnaire, the goal was to determine the weight of each

subcategory within each category. For instance, the effect of the 18-19 year old age sub-group compared to other sub-groups in the age category was investigated. In order to assess the sub-groups, a five-point Likert scale ranging from "strongly negative" to "strongly positive" was used. The expert panel suggested using a scale from -2 to 2 for ease of answering the survey, where -2 represents Strongly Negative, 0 represents Neutral (not affecting safety performance), and +2 represents Strongly Positive. For age, length of service with the company, and experience in the trade, sub-groups were based on categories used in reports published by the Bureau of Labor Statistics (BLS 2014). For education level, a combination of categories from Kunar and Bhattacherjee (2006), Fang et al. (2006), and the expert panel's comments was utilized. For the job level, the expert panel suggested using the common job titles used in the construction industry (apprentice, journeyman, foreman, superintendent). For the remaining factors, only two sub-groups were used. Figure 3.2 shows the questionnaire used in the survey.

Using your personal judgment and experience, please rate the impact of each of the following personal attributes on the safety performance of an employee. Provide a rating for each individual attribute.

Impact on Safety performance	Strongly Negative	Negative	Neutral (Not Effecting safety performance)	Positive	Strongly Positive
Rating	**-2**	**-1**	**0**	**1**	**2**

For example: Giving an attribute a rating of "-2"indicates that you feel the attribute has a "strongly negative" impact on safety performance on an employee.

Age (years)	18-19	20-24	25-34	35-44	45-54	55-64	65 and over
Rating							

Length of service with the company	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Rating				

Experience in the trade	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Rating				

Education Level	No Formal Education	Elementary School	High School	Higher Education	University
Rating					

Job Level	Apprentice	Journeyman	Foreman/Lead	Supervisors/Superintendent/PM
Rating				

Gender	Male	Female
Rating		

Marital Status	Married or in domestic relationship	Not married
Rating		

Dependents	No dependents	Has at least one dependent
Rating		

Multi-Jobs	One Job	More than one job
Rating		

Employee has had an injury that required more than first aid treatment	Yes	No
Rating		

Employee has observed an injury that required more than first aid treatment	Yes	No
Rating		

Job security perception	Employee feels his/her job is secure	Employee feels that his/her job is not secure
Rating		

Local vs. Traveler	Local	Traveler
Rating		

Union status	Union	Non
Rating		

Figure 3.2 Questionnaire used to capture the sub-groups' weightings

3.3 Risk Perception

3.3.1 Introduction

In this section, the effects and importance of worker risk perception in the construction industry are described. This is followed by an explanation of the quantification of risk perception for different activities, and finally the process used to create the risk scenarios is thoroughly described.

Past research has identified risk perception as one of the key factors affecting a person's safety on a job site. Hallowell (2010) defined risk perception as "subjective judgment that one makes about the frequency and severity of particular risks." Field employees are the people who encounter actual safety risks on job sites and, even with a good safety program in place, it is the worker's choice to take on the risk that could eventually cause injury to him/her (Howell et al. 2002). A worker who inaccurately assesses risk was identified as one of the key factors in risk-taking behaviors (Carter and Smith 2006). In a recent study, Tixier et al. (2014) also emphasized the importance of risk perception and its influence on risk-taking behavior. Floyd et al. (2014) explained the importance of risk perception and how it predicts the worker behavior.

3.3.2 Quantification of Risk

There have been many research studies regarding construction safety risk (Dharmapalan 2011), however not all of the studies pertain to the current study. In the current research the goal is to measure the risk perception of the employee based on the scenarios that include activities, hazard events, and incident types. Hallowell and Gambatese (2008) and Carter and Smith (2006) used user input and expert opinion assessment approaches to measure the risk based on probability and severity factors and activity risk influence factors. In these two studies, incident types and hazard event were the assessment criteria, respectively.

In order to measure risk perception and find its correlation with other factors, an objective method should be used to calculate the risk perception of field employees. Hallowell (2008) developed an objective method to quantify safety risks. In the proposed method, severity was determined based on the impact to the worker. Table 3.4, adopted from Hallowell (2008), shows the different levels of severity and the linear and associated geometric impact factors.

Table 3.4 Impact factors of different injury severities Hallowell (2008)

Severity categories (Injury type)	Linear scale value	Geometric scale value
Near miss	0	0
Negligible	0	1
Temporary discomfort	1	2
Persistent discomfort	2	4
Temporary pain	3	8
Permanent pain	4	16
Minor first aid	5	32
Major first aid	6	64
Medical case	7	128
Lost work time	8	256
Permanent disablement	9	1024
Fatality	10	26214

Hallowell (2008) recommended using a geometric scale because it models the relationship between injury severities properly. In Table 2.3, the numbers indicate the impact of the injury on the injured employee. For instance, a lost work time injury has a value of 256 and a medical case injury has a value of 128, which shows that a lost work time injury has double the impact on an employee compared to a medical case only injury. However, in the present study four levels of the severity were used based on OSHA's categorization of incidents. These categories include: Fatality, Hospitalized Injury, Non-Hospitalized Injury, and Near Miss. In order to calculate the weighted average of impact value for these categories, a method similar to that

developed by Dharmapalan (2011) was used. Equation 3.1 (adopted from Dharmapalan 2011) shows the conversion for the categories:

$$Y_1 = \frac{\sum_1^n x_i y_i}{\sum_1^n x_i} \quad (3.1)$$

In this formula, y corresponds to the geometric value and x corresponds to the linear scale value. For example, assume that the non-hospitalized injury category includes linear values of 1 through 6 which range from the negligible category to the major first aid category. The geometric value is then calculated as follows:

$$y_{nh} = \frac{(1\times2)+(2\times4)+(3\times8)+(4\times16)+(5\times32)+(6\times64)}{1+2+3+4+5+6} = 30.57$$

Impact factors were calculated with the same method for other categories used in the research. Table 3.5 shows the impact factors used for the present study.

Table 3.5 Impact factors for the severity categories in this research

Severity category	**Linear scale categories**	**Geometric impact factor for the current research**
Near miss	0	1
Non-hospitalized injury	1-6	30.57
Hospitalized injury	7-9	506.67
Fatality	10	26,214

In the present research, the value of near miss was set to one instead of zero. The reason for selecting a value of one was to recognize that near misses represent a risk to worker safety and to include this risk in the analysis. Giving a value of zero to near miss

would reduce its impact to zero, thus, neglecting an incident which could have caused an injury with severe impact if the conditions were slightly different.

The next step in calculating the risk was to obtain the probabilities. An objective method used by Gambatese and Hallowell (2008) and Dharmapalan et al. (2014) was incorporated. In this method the probability is calculated based on the frequencies with which an injury occurs while conducting the work. Frequency is defined as incidents per worker hour. A worker is assumed to work 45 hours a week, 50 weeks a year. For the purposes of this research, unit risk (severity per worker-hour) was used in order to measure risk perception. The unit risk was calculated as shown in Equation 3.2 (Hallowell and Gambatese 2008; Hallowell 2010; Dharmapalan 2011):

$$\text{Unit risk(S/w-h)} = \text{Frequency (Incident/w-h)} \times \text{Severity (S/Incident)} \qquad (3.2)$$

3.3.3 Design of Risk Scenarios

In order to create the risk scenarios and compare groups based on risk perception, a baseline value for safety risk while performing construction work was required. To create the baseline, the author used the accidents recorded in the OSHA database (OSHA 2015b) for the years from 2002 to 2012. A sample of an OSHA accident report is shown in Figure 3.3.

Return to Result Page

Accident: 202531497 - Electrical Repair Worker Is Shocked And Burned By Arc Flash

Accident: 202531497 -- Report ID: 0950635 -- Event Date: 07/16/2012

Inspection	Open Date	SIC	Establishment Name
313646804	12/06/2012	1731	Solex Contracting Inc.

At approximately 1:15 p.m. on July 16, 2012, an employee, of Solex Contracting, Inc., an electrical contractor, was replacing a power breaker cover after checking for proper wiring and power to the cell side. As he proceeded to put the panel cover back on, an electric arc flash occurred. The employee suffered severe first and second degree burns to his left arm, left hand, and right hand. The Long Beach Fire Department, which responded to this incident, reported it to Cal/OSHA's Torrance District Office at 16:59 p.m. on July 16, 2012. The employer reported the incident to the Torrance District Office at 10:00 a.m. on July 17, 2012.

Keywords: construction, electric arc, breaker plate, cover, electrician, electric shock, burn, arm, hand

End Use	Proj Type	Proj Cost	Stories	NonBldgHt	Fatality
Commercial building	Maintenance or repair	Under $50,000	2	20	

	Inspection	Age	Sex	Degree	Nature	Occupation	Construction
1	313646804			Hospitalized injury	Burn/Scald(Heat)	Occupation not reported	**FallDist**: **FallHt**: **Cause**: Interior plumbing, ducting, electrical work **FatCause**: Fire/explosion

Figure 3.3 Sample of OSHA accident report from OSHA (2015d)

The focus of this research study is on mechanical and electrical field employees, so the incident reports obtained from OSHA's website were related to these two trades. In order to achieve this goal the Standard Industry Classification (SIC) was used. For incidents related to the mechanical contractors, SIC code 1711 was used. According to SIC, 1711 is for specialty contractors working in the area of Heating, Ventilation, Air Conditioning (HVAC), and Plumbing. A similar method was utilized to extract information from incidents related to electrical

contractors. SIC code 1731 includes specialty contractors involved with electrical work in construction.

Computer code was developed in order to extract information from the OSHA webpages electronically. The goal was to read the webpages and search for specific keywords. Based on the keywords, records related to mechanical and electrical work were identified and the important information was extracted and represented in the appropriate output files. The input of this software was a text file containing the URL of desired webpages. As mentioned above, in the present case the accident reports available on www.osha.gov were of interest, including important information regarding the accidents. In the next step, the computer code was used to read each of the webpages and searched for certain keywords to find important information such as accident ID number, date, SIC, inspection, age, gender of injured worker, degrees attained, nature of the incident, occupation of injured worker, type of construction, etc. Afterwards, the final step was to analyze and organize the data in the appropriate output format. The main output of the computer code was a text file where each line showed one accident and specified the following features for that accident:

- Accident Number

- Title
- Date
- End Use
- Project Type
- Severity
- Nature
- Occupation
- Cause (type of work e.g. electrical work)
- Fatality Cause

Some additional questions were identified based on different outputs from the computer code as well. These questions were:

1. What are the fatality causes reported in the documents?
    a. How many times is each of the causes repeated?
    b. How many of the fatality causes were a part of "Hospitalized Injury", "Non-hospitalized Injury", and "Fatality" conditions?
2. What is the nature of the accidents reported in the documents?
3. What are the causes of the accidents reported in the documents?

These data were represented in the output text files. A sample of an output file showing the tabulated data is presented in Table 3.6.

The frequency of injuries for each severity level was created by the software for each of the injury causes. However, the results had a significant number of data missing for both SIC 1711 and SIC 1731. Thus, the author manually read all of the accident descriptions for the missing information. Table 3.7 shows the total number of records and number of records with missing information for both SIC 1711 and SIC 1731. The code is shown in Appendix D.

Table 3.6 Sample of output file from the code

Case number	Title	Building type	Project type	Severity	Injury or fatality cause
202584702	Employee Falls Through Skylight And Is Killed	Commercial building	New project or new addition	Fatality	Fall from/with structure (other than roof)
200357564	Worker Dies While Using Reciprocating Saw	Commercial building	New project or new addition	Fatality	Unknown
202539896	Employee Dies From Incident Connected With Electrical Shock	Other building	Maintenance or repair	Fatality	Electric shock, other and unknown cause
201073277	Two Workers Burned In An Arc Flash	Commercial building	Maintenance or repair	Hospitalized injury	Electrical burn/Arc flash
201073277	Two Workers Burned In An Arc Flash	Commercial building	Maintenance or repair	Hospitalized injury	Electrical burn/Arc flash
202550216	Employee Amputated Finger While Wire Brushing Rebar	Commercial building	Other	Hospitalized injury	Caught in stationary equipment
200604197	Employee Is Killed In Fall From Tree	Single family or duplex dwelling	New project or new addition	Fatality	Fall, other

Table 3.7 Summary of records obtained by the code

SIC	Total number of incident reports from 2002 to 2012	Reports with missing information	Deleted
1711 (Mechanical)	793	130	10
1731 (Electrical)	1087	139	14

After analyzing the incidents with missing information, additional categories of injury causes were established to include those incidents. Moreover, 14 reports were deleted because of a lack of description of the incident, or the incident was not related to mechanical or electrical contractors. Tables 3.8 and 3.9 show the number of incidents for each severity level for SIC 1711 and SIC 1731, respectively.

Table 3.8 Injury cause counts for each severity category in SIC 1711 (Mechanical)

Injury causes (code output)	Non-hospitalized injury	Hospitalized injury	Fatality
Animal/Insect attack	0	1	0
Asphyxiation/inhalation of toxic vapor	12	12	12
Caught in/Struck/Cut by building equipment	5	9	0
Caught in/Struck/Cut by Tools (Tool Use)	10	19	1
Caught between materials	6	3	0
Caught in stationary equipment	4	8	1
Chemical Burn/Chemical Exposure	0	5	0
Collapse of structure	0	4	5
Crushed/run-over by construction equipment during	0	2	3
Crushed/run-over by highway vehicle	0	1	1
Crushed/run-over of non-operator by operating cons	2	8	8
Crushed/run-over/trapped of operator by operating	0	4	10
Cut/Laceration Other	1	2	0
Cuts by materials	1	2	0
Drown, non-lethal fall	0	1	0
Electric Shock from Faulty Equipment (Building Equipment)	0	4	5
Electric shock, other and unknown cause	5	4	17
Electrical Burn/Arc Flash	1	3	0
Electrocution by equipment contacting wire	0	1	7
Electrocution by touching exposed wire/source	0	1	21
Electrocution from equipment installation/tool use	0	0	10
Fall from roof	4	30	15
Fall from vehicle (vehicle/construction equipment)	0	4	2
Fall from/with bucket (aerial lift/basket)	1	8	7
Fall from/with ladder	5	80	39
Fall from/with platform catwalk (attached to structure	2	3	5

Table 3.8 (Continued)

Injury causes (code output)	Non-hospitalized injury	Hospitalized injury	Fatality
Fall from/with scaffold	0	6	8
Fall from/with structure (other than roof)	2	18	10
Fall on the same level (Slip\Trip)	0	3	0
Fall through opening (other than roof)	3	20	11
Fall, other	3	20	8
Fire/explosion	9	34	17
Heart attack	0	0	16
Heat/hypothermia	0	2	1
Lifting operations	0	1	1
Natural Disaster	0	0	1
Steam/Hot water burn	8	9	0
Struck by falling object/projectile	10	33	21
Trench collapse	5	18	23
Unknown	1	0	6
Unloading-loading equipment/material (except by crane)	0	0	3
Wall (earthen) collapse	0	1	3
Work Place Violence	0	0	1
Total	100	384	299

Table 3.9 Injury cause counts for each severity category in SIC 1731 (Electrical)

Injury causes (code output)	Non-hospitalized injury	Hospitalized injury	Fatality
Animal/Insect attack	0	0	0
Asphyxiation/inhalation of toxic vapor	0	1	7
Caught in/Struck/Cut by building equipment	1	2	2
Caught in/Struck/Cut by Tools (Tool Use)	4	7	0
Caught between materials	4	4	0
Caught in stationary equipment	1	6	3
Chemical Burn/Chemical Exposure	0	0	0
Collapse of structure	2	5	2
Crushed/run-over by construction equipment during	0	3	3
Crushed/run-over by highway vehicle	0	8	14
Crushed/run-over of non-operator by operating cons	0	6	9
Crushed/run-over/trapped of operator by operating	1	5	19
Cut/Laceration Other	1	1	0
Cuts by materials	0	1	0
Drown	0	0	1
Drown, non-lethal fall	0	1	0
Electric Shock from Faulty Equipment (Building Equipment)	0	0	0
Electric shock, other and unknown cause	18	67	22
Electrical Burn/Arc Flash	9	41	5
Electrocution by equipment contacting wire	3	15	22
Electrocution by touching exposed wire/source	3	35	148
Electrocution from equipment installation/tool use	1	18	36
Fall from roof	0	10	7
Fall from vehicle (vehicle/construction equipment)	0	5	5
Fall from/with bucket (aerial lift/basket)	1	16	24
Fall from/with ladder	9	86	45
Fall from/with platform catwalk (attached to structure	1	5	4
Fall from/with scaffold	0	10	9
Fall from/with structure (other than roof)	2	22	7
Fall on the same level (Slip\Trip)	0	1	0

Table 3.9 (Continued)

Injury causes (code output)	Non-hospitalized injury	Hospitalized injury	Fatality
Fall through opening (other than roof)	1	7	3
Fall, other	3	33	18
Fire/explosion	7	54	13
Heart attack	1	0	23
Heat/hypothermia	1	2	1
Lifting operations	1	6	2
Motor vehicle accident	0	0	3
Natural disaster	0	0	0
Other	0	0	0
Steam/Hot water burn	0	1	0
Struck by falling object/projectile	5	25	16
Trench collapse	0	0	4
Unknown	0	0	5
Unloading-loading equipment/material (except by crane	1	0	0
Wall (earthen) collapse	0	0	1
Work Place Violence	0	0	0
Total	81	509	483

For the purpose of creating the scenarios, the frequencies in the tables above were assumed to be for one worker working 40 hours a week. By incorporating the method mentioned above to quantify the risk, the unit risk for each severity level and the total unit risk for each of the causes were calculated. Tables 3.10 and 3.11 show the calculated risk values based on the method described in section 3.2.2 for SIC 1711 and SIC 1731, respectively.

Table 3.10 Calculated risk of injury causes for SIC 1711 (Mechanical)

Injury cause	Unit risk non-hospitalized Injury	Unit risk hospitalized Injury	Unit risk fatality	Total Unit risk
Animal/Insect attack	0.00	0.02	0.00	0.02
Asphyxiation/inhalation of toxic vapor	0.02	0.27	13.98	14.27
Caught in/Struck/Cut by building equipment	0.01	0.20	0.00	0.21
Caught in/Struck/Cut by Tools (Tool Use)	0.01	0.43	1.17	1.61
Caught between Materials	0.01	0.07	0.00	0.08
Caught in stationary equipment	0.01	0.18	1.17	1.35
Chemical Burn/Chemical Exposure	0.00	0.11	0.00	0.11
Collapse of structure	0.00	0.09	5.83	5.92
Crushed/run-over by construction equipment during	0.00	0.05	3.50	3.54
Crushed/run-over by highway vehicle	0.00	0.02	1.17	1.19
Crushed/run-over of non-operator by operating cons	0.00	0.18	9.32	9.50
Crushed/run-over/trapped of operator by operating	0.00	0.09	11.65	11.74
Cut/Laceration Other	0.00	0.05	0.00	0.05
Cuts by Materials	0.00	0.05	0.00	0.05
Drown, non-lethal fall	0.00	0.02	0.00	0.02
Electric Shock from Faulty Equipment (Building Equipment)	0.00	0.09	5.83	5.92
Electric shock, other and unknown cause	0.01	0.09	19.81	19.90
Electrical Burn/Arc Flash	0.00	0.07	0.00	0.07
Electrocution by equipment contacting wire	0.00	0.02	8.16	8.18
Electrocution by touching exposed wire/source	0.00	0.02	24.47	24.49
Electrocution from equipment installation/tool	0.00	0.00	11.65	11.65
Fall from roof	0.01	0.68	17.48	18.16
Fall from vehicle (vehicle/construction equipment)	0.00	0.09	2.33	2.42
Fall from/with bucket (aerial lift/basket)	0.00	0.18	8.16	8.34
Fall from/with ladder	0.01	1.80	45.44	47.25
Fall from/with platform catwalk (attached to structure)	0.00	0.07	5.83	5.90
Fall from/with scaffold	0.00	0.14	9.32	9.46

Table 3.10 (Continued)

Injury cause	Unit risk non-hospitalized Injury	Unit risk hospitalized Injury	Unit risk fatality	Total Unit risk
Fall from/with structure (other than roof)	0.00	0.41	11.65	12.06
Fall on the same level (Slip\Trip)	0.00	0.07	0.00	0.07
Fall through opening (other than roof)	0.00	0.45	12.82	13.27
Fall, other	0.00	0.45	9.32	9.77
Fire/explosion	0.01	0.77	19.81	20.58
Heart Attack	0.00	0.00	18.64	18.64
Heat/hypothermia	0.00	0.05	1.17	1.21
Lifting operations	0.00	0.02	1.17	1.19
Natural Disaster	0.00	0.00	1.17	1.17
Steam/Hot water burn	0.01	0.20	0.00	0.21
Struck by falling object/projectile	0.01	0.74	24.47	25.22
Trench collapse	0.01	0.41	26.80	27.21
Unknown	0.00	0.00	6.99	6.99
Unloading-loading equipment/material (except by crane)	0.00	0.00	3.50	3.50
Wall (earthen) collapse	0.00	0.02	3.50	3.52
Work Place Violence	0.00	0.00	1.17	1.17

Table 3.11 Calculated risk of injury causes for SIC 1731 (Electrical)

Injury cause	Unit risk non-hospitalized Injury	Unit risk hospitalized Injury	Unit risk fatality	Total Unit risk
Animal/Insect attack	0.00	0.00	0.00	0.00
Asphyxiation/inhalation of toxic vapor	0.00	0.02	8.16	8.18
Caught in/Struck/Cut by building equipment	0.00	0.05	2.33	2.38
Caught in/Struck/Cut by Tools (Tool Use)	0.01	0.16	0.00	0.16
Caught between Materials	0.01	0.09	0.00	0.10
Caught in stationary equipment	0.00	0.14	3.50	3.63
Chemical Burn/Chemical Exposure	0.00	0.00	0.00	0.00
Collapse of structure	0.00	0.11	2.33	2.45
Crushed/run-over by construction equipment during	0.00	0.07	3.50	3.56
Crushed/run-over by highway vehicle	0.00	0.18	16.31	16.49
Crushed/run-over of non-operator by operating cons	0.00	0.14	10.49	10.62
Crushed/run-over/trapped of operator by operating	0.00	0.11	22.14	22.25
Cut/Laceration Other	0.00	0.02	0.00	0.02
Cuts by Materials	0.00	0.02	0.00	0.02
Drown	0.00	0.00	1.17	1.17
Drown, non-lethal fall	0.00	0.02	0.00	0.02
Electric Shock from Faulty Equipment (Building Equipment)	0.00	0.00	0.00	0.00
Electric shock, other and unknown cause	0.02	1.51	25.63	27.16
Electrical Burn/Arc Flash	0.01	0.92	5.83	6.76
Electrocution by equipment contacting wire	0.00	0.34	25.63	25.97
Electrocution by touching exposed wire/source	0.00	0.79	172.43	173.22
Electrocution from equipment installation/tool use	0.00	0.41	41.94	42.35
Fall from roof	0.00	0.23	8.16	8.38
Fall from vehicle (vehicle/construction equipment)	0.00	0.11	5.83	5.94
Fall from/with bucket (aerial lift/basket)	0.00	0.36	27.96	28.32
Fall from/with ladder	0.01	1.94	52.43	54.38
Fall from/with platform catwalk (attached to structure)	0.00	0.11	4.66	4.77
Fall from/with scaffold	0.00	0.23	10.49	10.71
Fall from/with structure (other than roof)	0.00	0.50	8.16	8.65
Fall on the same level (Slip\Trip)	0.00	0.02	0.00	0.02
Fall through opening (other than roof)	0.00	0.16	3.50	3.65

Table 3.11 (Continued)

Injury cause	Unit risk non-hospitalized Injury	Unit risk hospitalized Injury	Unit risk fatality	Total Unit risk
Fall, other	0.00	0.74	20.97	21.72
Fire/explosion	0.01	1.22	15.15	16.37
Heart Attack	0.00	0.00	26.80	26.80
Heat/hypothermia	0.00	0.05	1.17	1.21
Lifting operations	0.00	0.14	2.33	2.47
Motor Vehicle Accident	0.00	0.00	3.50	3.50
Natural Disaster	0.00	0.00	0.00	0.00
Other	0.00	0.00	0.00	0.00
Steam/Hot water burn	0.00	0.02	0.00	0.02
Struck by falling object/projectile	0.01	0.56	18.64	19.21
Trench collapse	0.00	0.00	4.66	4.66
Unknown	0.00	0.00	5.83	5.83
Unloading-loading equipment/material (except by cranes)	0.00	0.00	0.00	0.00
Wall (earthen) collapse	0.00	0.00	1.17	1.17
Work Place Violence	0.00	0.00	0.00	0.00

The next step in creating the risk scenarios was to group and categorize the causes based on the calculated unit risk. A cluster analysis using three severity levels (Non-hospitalized injury, Hospitalized injury, and Fatality) was carried out using the Statistical Package for the Social Sciences (SPSS) software to group incidents based on total unit risk. Figures 3.4 and 3.5 present the results of the cluster analysis for total unit risk for SIC 1711 and SIC 1731,

respectively. The results of the cluster analysis for each of the severity levels are available in Appendix E.

var: Unit Risk
Dendrogram using Average Linkage (Between Groups)

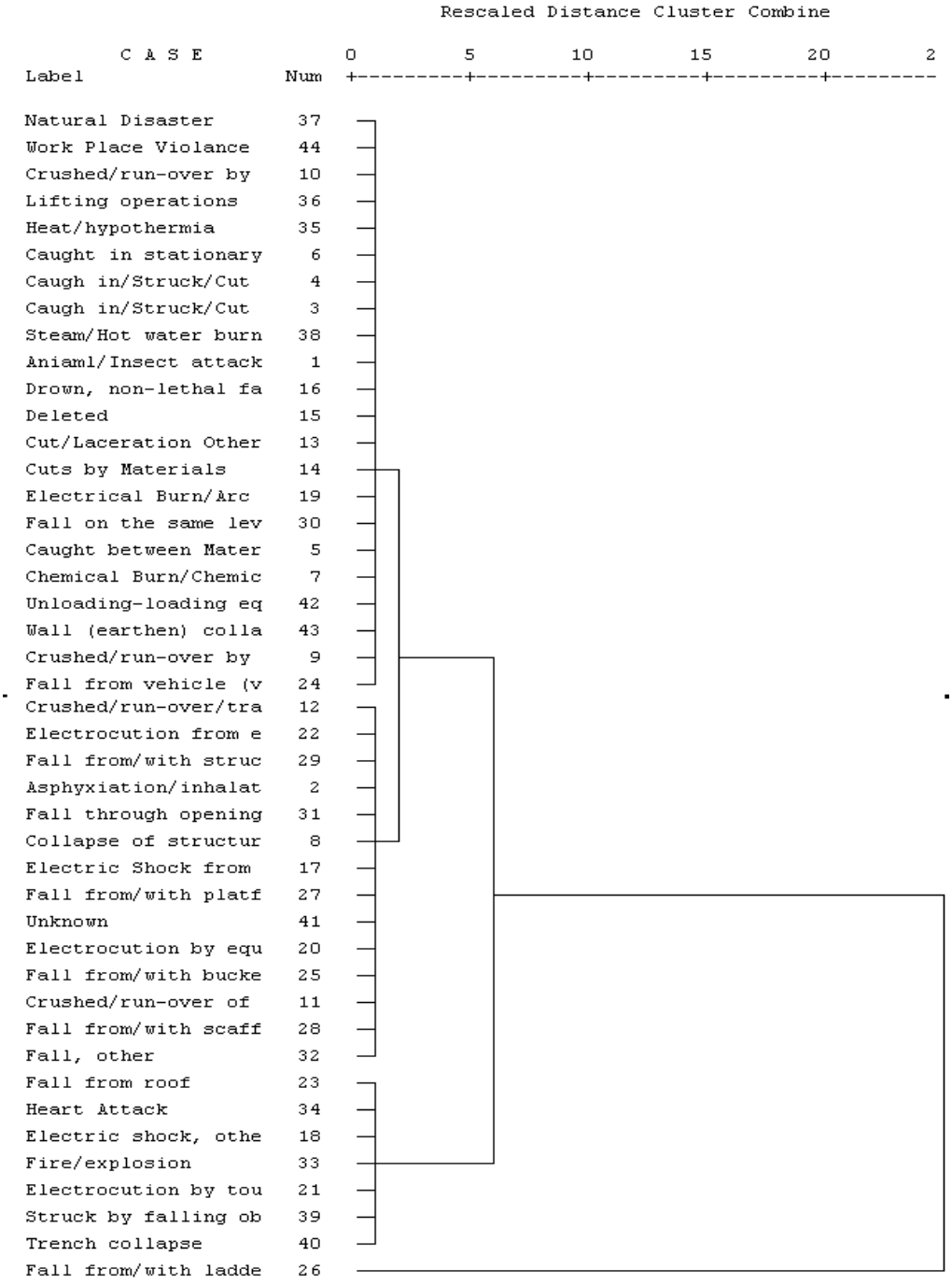

Figure 3.4 Results of cluster analysis for SIC 1711 (Mechanical)

var: Unit Risk ....
Dendrogram using Average Linkage (Between Groups)

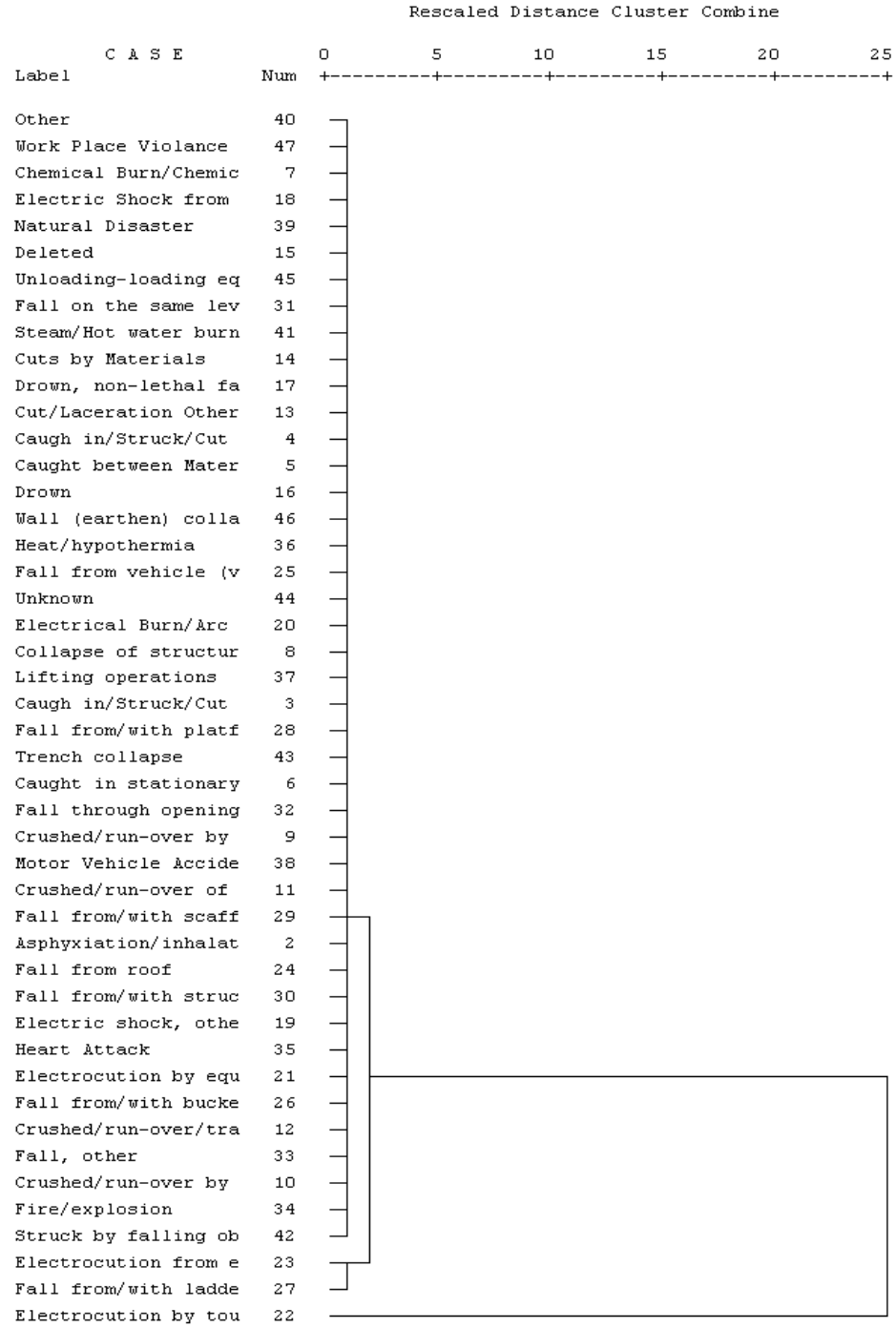

Figure 3.5 Results of cluster analysis for SIC 1731 (Electrical)

Based on the cluster analysis results, three injury causes were chosen in each severity level and also in the total risk level. The three items were chosen to reflect a high risk, medium risk, and low level risk. With the help of the expert panel, scenarios were created to reflect each of these injury causes. For example, the "Fall from/with ladder" category for SIC 1711 was chosen and the following risk scenario was developed:

> "A sheet metal craft employee is installing a control box in a ceiling grid while standing on a 10-ft tall ladder."

The goal in this section was to generate scenarios that would be descriptive of the operation taking place, but not emphasize the risks so that the employees reviewing the scenario will not be biased toward any particular safety risks. Also, the developed scenarios contained activities that are common tasks that the trades, i.e., employees, usually encounter in their daily activities. Furthermore, it should be noted that it was not possible to write all of the scenarios with only one injury cause. Thus, the scenarios could have more than one injury cause associated with them. Tables 3.12 and 3.13 show the developed scenarios for SIC 1711 and SIC 1731, respectively.

Table 3.12 Scenarios developed for mechanical craft work (SIC 1711)

No.	Scenario
1	A sheet metal craft employee is installing a control box in a ceiling grid while standing on a 10-ft tall ladder.
2	A pipefitter is installing unsecured, overhead, 2-inch diameter steel pipe in 10-ft long sections. Work is being done from a scissor lift.
3	A mechanical craft employee is using a Sawzall to cut a hole in a wall to install a chilled water line. The employee did not check whether utilities were present in the wall.
4	A pipefitter installed a 6-inch PVC line with a temporary cap on the end, and now needs to test the system by pressurizing it.
5	A service mechanic is conducting maintenance on a rooftop air handler unit which is located 3 feet from the edge of the roof. The roof has a low parapet.
6	A plumber is using a portable band saw to cut overhead 2-inch steel pipe
7	A pipefitter is working in a 2-ft wide by 6-ft tall tunnel underneath a building. The worker is welding steel pipe to install ammonia lines.
8	A pipefitter is operating a pipe threading machine to thread a 3-inch steel sprinkler line.
9	A plumber is installing an underground sewer line in a 4-ft deep excavation on a small site. A backhoe is working on a trenching operation nearby.
10	A mechanical craft employee is moving pipe on a summer day in a hot climate area.
11	A service technician is repairing a steam pipe hanger on a live line.

Table 3.13 Scenarios developed for electrical craft work (SIC 1731)

No.	Scenario
1	An electrician is diagnosing a heating unit panel (480V) in a ceiling grid while the unit is operating. The work is being done from a scissor lift.
2	An electrician is diagnosing a heating unit panel (480V) in a ceiling grid while the unit is operating. The work is being done from a ladder.
3	An electrician is working on a de-energized panel while other trades are installing conduit overhead from a platform nearby.
4	An owner requests an electrician to secure an old panel cover and door while it is energized. The condition of the panel inside is unknown to the electrician.
5	An electrician is demolishing an old light fixture on a wall and replacing it with a new fixture.
6	An electrician is cutting an unsecured conduit using a portable band saw.
7	An electrician is placing underground conduit while heavy equipment operates nearby in the surrounding area.
8	An electrician is working from a ladder near an elevator shaft opening. The shaft opening has top and mid-guardrails surrounding the opening.
9	An electrician is installing hangers for conduit on roof during the summertime. The weather is hot, and fall protection provided around roof edge
10	A data line installer is moving materials with a cart out of a construction storage unit.
11	A data craft employee is pulling wire for the construction of a data center.

For each work scenario, surveyed participants were asked to indicate the frequency of injury for each of the severity levels. The severity levels are shown in Table 3.14. Figure 2.4 illustrates the instructions page of this section of the survey questionnaire that describes how to input the survey responses.

Table 3.14 Description of severity levels

Severity	Description
Near miss	No injury and impact on work time
Non-hospitalized injury	Injured employee is able to get back to work on the same day (Incident requiring first aid)
Hospitalized injury	Injured employee misses work time more than one day (Incident causing lost work time or hospitalization)
Fatality	Employee does not return to work ever (Incident results in death or long-term disability)

Activity Risk Perception

In this section, please complete **each** of the "Frequency of Injury" fields in the table below. Using your personal experience and judgment, indicate, for a single worker or work crew, in each of the scenarios, what would be the frequency of injury for different severity levels, using the frequency scale below:

Frequency Scale: Average amount of time between incidents per worker										
Impossible	Negligible	50 years	10 years	5 years	1 year	6 months	1 month	1 week	1 day	1 hr
0	1	2	3	4	5	6	7	8	9	10

Severity	Description**
Near Miss	No Injury and impact on work time
Non-Hospitalized Injury	Injured employee is able to get back to work on the same day (Incident requiring first aid)
Hospitalized Injury	Injured employee misses work time more than one day (Incident causing lost work time or hospitalization)
Fatality	Employee does not return to work ever (Incident results in death or long-term disability)

**Please note that an incident refers to an injury caused during that specific scenario

An explanatory sample is shown below for your reference.

A "Fatality" is impossible in this scenario

	Scenarios	Frequency for Severity Levels			
		Near Miss	Non-Hospitalized Injury	Hospitalized Injury	Fatality
1	A sheetmetal craft employee is installing a control box in a ceiling grid while standing on a 10-ft tall ladder.	10	4	4	0
2	A pipefitter is installing unsecured, overhead, 2-inch diameter steel pipe in 10-ft long sections. Work is being done from a scissor lift.	8	9	1	3

A "Near Miss" could happen once every hour in this scenario"

A "Non-Hospitalized Injury" could happen once every 5 years in this scenario

The possibility of a "Hospitalized Injury" is negligible in this scenario

Figure 3.6 Instructions for completing the risk perception section of the survey questionnaire

3.4 Hazard Identification

In this section, the importance of hazard identification will be discussed, and the method which was incorporated to create the survey questionnaire based on the literature review and expert panel's input will be explained.

Abdelhamid and Everett (2000) used an accident root causes tracing model to study safety in the construction industry. This model was based on the assumption that accidents have three root causes: failing to identify an unsafe condition, deciding to proceed with a work activity in an unsafe condition, and deciding to act unsafely. Hazard identification of field employees is crucial to many construction safety management systems (Adbelhamid et al. 2011; Lu et al. 2011; Albert et al. 2014). Albert et al. (2014) stressed the importance of hazard identification abilities of field crews where an unidentified hazard could potentially cause serious injury.

Several research studies in the construction industry have been conducted to measure the hazard identification ability of field crews (Carter and Smith 2006; Bahn 2013; Albert et al. 2014). These studies concluded that employees generally lack the skill to identify the hazards in their work environment. Albert et al. (2014) and Bahn (2013) found that employees only identified 46% and 43% of the

hazards, respectively. There has been research conducted to develop methods to enhance the hazard identification abilities of employees. For instance, Albert et al. (2014) suggest incorporating an augmented virtual reality environment to improve the hazard identification of the employees. Albert et al. (2013) also developed a job safety meeting quality measurement tool (SMQM) to enhance the hazard identification of employees.

The present research aims to investigate the hazard identification of mechanical and electrical field employees and its relationship with safety knowledge, risk perception, and personal factors.

3.4.1 Development of Survey Questionnaire

In order to assess the ability to identify hazards (hazard identification level) of employees, a method similar to that used by Carter and Smith (2006) was utilized for the present study. Carter and Smith introduced a hazard identification index which is the ratio of identified hazards to the total number of hazards present. A similar method was used by Albert et al. (2013) to measure hazard identification of field employees. In their study, Albert et al. calculated a hazard index using the total number of hazards identified by a panel. Subsequently, Albert

et al. (2014) utilized a hazard index method to validate the effectiveness of their method to improve hazard recognition in field employees. The hazard index in this method was slightly modified where the total number of hazards for the baseline was based on the input of field workers and an expert panel.

For the purposes of the present research, based on the literature review and the expert panel's input, an index was created using the hazards present, bad safety practices, and positive safety practices in the scenarios presented. The main focus in adding the positive safety practices was to examine the correlation and influence of having an ability to identify good practices compared to hazards. The Multi-Layer Hazard Index (MLHI) is defined in the following Equation (Equation 3.3):

$$MLHI = \frac{H_H^I + H_{BP}^I + H_{PP}^I}{H_H^T + H_{BP}^T + H_{PP}^T} \qquad (3.3)$$

In Equation (3.3), $H_H^T, H_{BP}^T, and H_{PP}^T$ are the total number of hazards, bad practices, and positive practices, respectively. The total number is obtained from the expert panel's hazard assessment of the scenarios. Consequently, $H_H^I, H_{BP}^I, and\ H_{PP}^I$ are the hazards, good practices, and bad practices identified by the employees. In this method, each hazard and (bad or good) practice identified is given a

score of one. The reason to include the good practices is that missing to identify good practices is a sign that the employee is not familiar with good practices and disregards them, which could affect the safety performance of the person. A high MLHI value indicates that the individual can identify the hazards on the site properly. In contrast low MLHI value will indicate that the employee lacks the ability to identify the hazards in an occupational environment.

In order to create the work scenarios, pictures were used to simulate actual work conditions which were then used to assess the hazard identification level of workers. A database of picture scenarios including more than 60 pictures was created. The resources used for these pictures were from OSHA outreach training documents available on the OSHA website (OSHA 2015C) and the Electronic Library of Occupational Safety and Health (ELCOSH 2015). The pictures were grouped into the four categories of the OSHA Focus Four: Falls, Caught-In or –Between, Struck-By, and Electrocution.

Two scenarios for each OSHA Focus Four category were chosen randomly from the scenario database using the Microsoft Excel random number generator. The expert panel reviewed each of the scenarios and identified the safety hazards, bad safety practices, and good safety practices present in the scenario.

The following figure (Figure 3.7) shows a sample scenario with instructions on how to complete the section in the survey.

Section 3:

In this section, please identify the hazards present, bad safety practices, and good safety practices for the actions/conditions shown in each of the pictures using your own judgment and experience. An example is provided below. Please note that when identifying the hazards, write all of the hazards that you can identify regardless of the practice. For example, the tool is insulated and shown to be used correctly; however, the electrical hazard still exists.

Example:

Hazards Present	• Fall hazard • Electrical hazard • Struck by hazard
Bad Safety Practices	• Incorrect ladder use • No safety glasses
Good Safety Practices	• Proper tool handling (using the tool bag)

Figure 3.7 Sample scenario with instructions

3.5 Safety Knowledge

3.5.1 Introduction

The importance of safety knowledge and training amongst workers has been investigated in several studies. A sample of applicable studies on the topic is provided below:

- Vinodkumar and Bhasi (2009) used safety knowledge and compliance with safety regulations as one of the eight factors affecting the safety climate of workers.
- Fang et al. (2006) conducted a research study to identify the factors influencing safety climate. In this research the importance of safety knowledge and training in a company was emphasized.
- Wallen and Mully (2006) revealed the importance of safety training as a preventative tool for occupational illnesses. The researchers also exposed the significance of understanding the safety training as a key component of safety knowledge.
- Suruda (2003) investigated respirator incidents causing fatalities and identified lack of proper training as the main factor.
- Sari (2009) investigated the significance of employee training on occupational health and safety. This research study found the

positive effect of training on safety. The training elements relevant to safety in the research by Sari were job orientation, first aid, emergency drills, personal protective equipment, ergonomics, and material handling.

- Lombardi et al. (2009) conducted a research study to identify the factors affecting the utilization of personal protective eyewear. Lack of safety training was identified as one of the important factors involving the personal protective eyewear usage.
- Goldenhar et al. (2001) examined safety training in construction companies. Effectiveness of training in the surveyed companies was evaluated by observing job performance, employee's satisfaction, formal testing, workers comp rates, and EMR.

From the literature mentioned above it is derived that safety knowledge is one of the important factors influencing different aspects of safety such as safety climate and safety performance of the workers and employees.

3.5.2 Creating the Test Questionnaire

In order to assess safety knowledge of employees, the formal test method was used. A formal test is commonly used in the industry to

verify the knowledge of workers regarding safety regulations. To create the framework for the test, OSHA 10-hour construction industry training guidelines were used. The OSHA 10-hour construction class is designed for entry-level employees with the goal of ensuring that workers and employees have knowledge regarding the recognition, avoidance, abatement, and prevention of hazards in their workplace and know their rights as workers (OSHA 2015b). The OSHA 10-hour construction test covers seven mandatory sections which are:

- Introduction to OSHA
- OSHA Focus Four hazards:
    - Fall hazards
    - Electrocution
    - Struck-by
    - Caught-in or between
- Personal protective equipment
- Health hazards in construction

The OSHA 10-hour class also has six topics within an elective section. In the present research and for testing the knowledge of employees, all of the six topics were tested. The six topics in the elective section of the OSHA 10-hour construction test include:

- Cranes, derricks, hoists, elevators, and conveyors

- Excavations
- Materials handling, storage, use, and disposal
- Scaffolds
- Stairways and ladders
- Hand and power tools

A database of questions was created based on the following sources: OSHA Focus Four knowledge test (OSHA 2015c), OSHA #510 - Occupational Safety and Health Standards for the Construction Industry Knowledge Test (OSHA Region 10 test), OSHA #500 - Trainer Course in OSHA Standards for Construction (OSHA Region 10 test), Keller's OSHA Construction Safety Handbook (J.J. Keller 2010), and questions provided by the expert panel. The questions were reviewed by the expert panel to assess the level of difficulty of the questions.

Questions with a higher level of difficulty than the OSHA 10-hour class questions were deleted from the database. The list of test questions included more than one hundred questions in total. Using the Microsoft Excel random number generator, one question was randomly selected for each of the 13 sections (7 mandatory sections and 6 elective sections). The followings are the questions used in the survey:

1. One of the main responsibilities employers have under OSHA is to:

a) Provide training required by OSHA standards.

b) Reduce air pollution in the environment.

c) Conduct energy audits.

d) Notify OSHA of any workplace injury or illness.

2. In general, fall protection must be provided to construction workers who are working on surfaces with unprotected sides and edges which are _____ above the lower level:

   a) 3 feet b) 4 feet c) 6 feet d) 10 feet

3. A ground fault circuit interrupter (GFCI):

   a) Detects ground faults and interrupts the flow of electric current, and is designed to protect the worker by limiting the duration of an electrical shock.

   b) Detects ground faults and interrupts the electric source thus, it disables the equipment that is attached; however, the worker is still exposed to electrocution.

   c) A tool used to determine if a power system is properly grounded.

4. A struck-by hazard can be described as anytime a worker _____.

   a) Falls from a height of greater than ten feet

   b) Is hit by a falling, swinging, flying or rolling object

c) Can get any part of his/her body caught in or in between objects

5. To prevent being pinned between equipment or other objects, workers should avoid _____.
   a) Using a trench box or shield during excavation work
   b) Placing themselves between moving vehicles and an immovable structure, vehicle, or staked materials
   c) Removing a safety guard when a tool such as a circular saw or power drill is being used.
6. Some common foot hazard include:
   a) Compression b) Puncture c) Extreme heat or cold d) All the above
7. Asbestos fibers can enter the body by:
   a) Osmosis b) Inhalation c) Ingestion d) b and c
8. Work area control for crane and hoist operations can be recognized by the use of:
   a) Warning lines b) Tag out devices c) Lockout devices d) Fall protection
9. The hazard considered to be the greatest in excavation work is:
   a) Falls
   b) Cave-ins

c) Severing underground utility

d) Equipment falling in trench

10. If a seat belt is provided on equipment, you don't have to use it

a) True b) False

11. Before a suspension scaffold may be used, the connections must be checked by a:

a) Qualified person

b) Competent person

c) Company owner

d) Customer

12. When using a portable ladder, the side rail should extend at least _____ above the upper landing surface

a) 1 foot

b) 3 feet

c) 5 feet

d) 12 feet

13. Machine guards protect operators from:

a) Finished product

b) Stationary parts

c) Flying chips and sparks or flying parts

d) All of the above

3.6 Survey Participants

The current research focuses on mechanical and electrical fields; thus, field employees, supervisors, project engineers, safety engineers, safety managers; and project managers involved with these trades in Pacific Northwest were asked to participate in the research study. The process to distribute the surveys is discussed next.

First, safety managers and project managers of several large ongoing projects in Pacific Northwest were contacted to ask about the possibility of surveying the mechanical and electrical workers on their job sites. Two sites agreed to participate in the survey. The first site was a pre-fabrication shop for a mechanical contractor. A total of fifteen survey questionnaires were distributed in that location. The employees received a copy of the research explanation and recruitment letter approved by the Institutional Review Board (IRB).

Due to the nature of the survey and to put workers at ease, it was explained in detail that the survey was confidential and anonymous, and the results would be stored in a pool of data gathered from other contractors and job sites as well. Moreover, the employees were told that their participation was completely voluntary and if they feel uncomfortable answering any part of the survey they could leave it blank. A sample of the communications is available in Appendix F.

The researcher explained the different parts of the survey questionnaire to participants and answered any questions that the workers had. In the risk perception section, the researcher emphasized to the employees that they should use their own judgment and experience to answer the questions and not base their answers on the company's safety records or what they have heard. This step was crucial as it would reduce the influence of Von Restroff and Recency bias (Hallowell 2009; Dharmapalan 2011). Employees were given a week to complete the questionnaire and a box was provided so employees could turn their responses in anonymously.

The second project was a commercial office space core and tenant improvement. In this project, sheetmetal workers, electricians, pipefitters, and sprinkler fitters were surveyed. A total of 59 workers were surveyed on this project. The distribution process used was similar to that at the previous project location. Although the study participants were surveyed from two different projects, since they were union employees they were temporarily on the projects and have been on many different job sites with many different contractors. Furthermore, the survey was designed to get the responses regardless of the outside project conditions. Consequently, the participant sample was still a good representation of the trades.

In the next step safety engineers and managers, and project engineers and managers, were contacted via email with the survey questionnaire attached. The recruitment email is available on Appendix G. Twenty-two people were contacted in total for the above mentioned group. The sample of distributed surveys is available in Appendix H.

4 Results

In this section, responses from the distributed survey are analyzed and prepared for the analysis. First, the demographic information of participants and a statistical analysis of this information are conducted. Next, the responses and processing the data are discussed. Lastly, the method incorporated to prepare the data for the analysis section is explained.

4.1 Participant Demographics

The last part of the survey questionnaire included questions regarding the demographic information of the survey participants. This section included questions regarding the following: age, length of service with the company, education level, job level, gender, experience in the trade, marital status, dependents, number of jobs, job security, being local or traveler, union status, injury experience, and observing injury experience. This information was consistent with the first section of survey that asked about the influence of personal and demographic factors on safety. The reason for selecting these attributes were thoroughly discussed in Sections 2.1 and 2.5.

In total, 50 responses were collected from the 81 individuals who were contacted and agreed to help. Due to the length of the survey,

partial responses were also considered in the analysis. The number of responses for field and staff employees (engineers, supervisors, etc.) are available in Table 4.1.

Table 4.1 Summary of response rates

	Number of surveys distributed	**Number of responses**	**Response rate**
Field personnel	59	37	62.71 %
Staff (engineers, managers, supervisors, and safety)	22	9	40.9 %
Overall	81	50	61.72 %

Out of the 50 respondents, 41 (82%) responded to the mechanical section, 11 responded to the electrical section, and three participants (two safety engineers and one project managers) responded to both sections.

Figures 4.1 to 4.13 present the demographic information of the respondents.

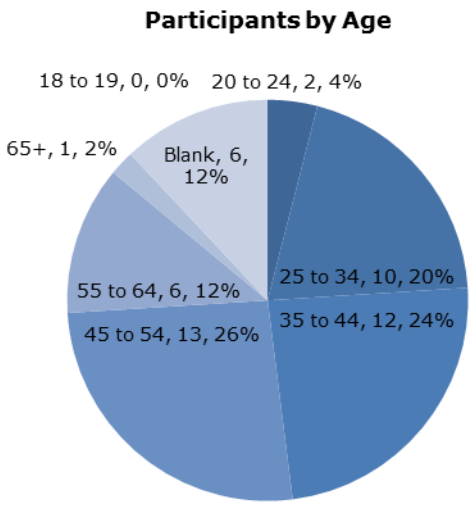

Figure 4.1 Distribution of survey participants by age

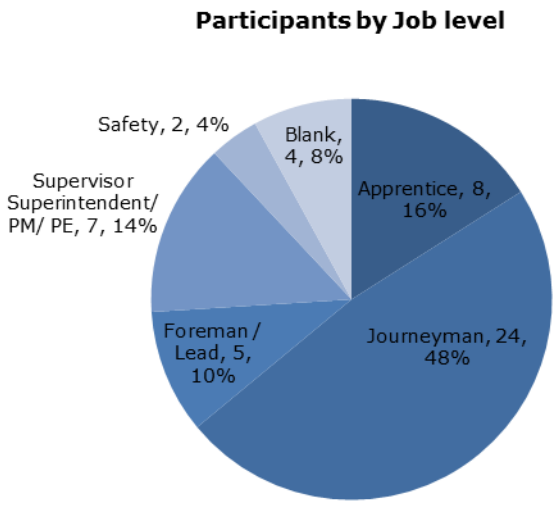

Figure 4.2 Distribution of survey participants by job level

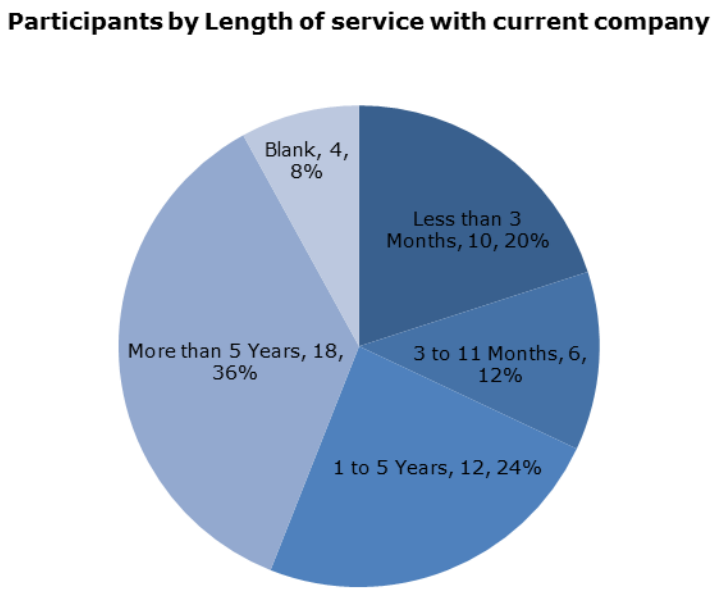

Figure 4.3 Distribution of survey participants by length of service

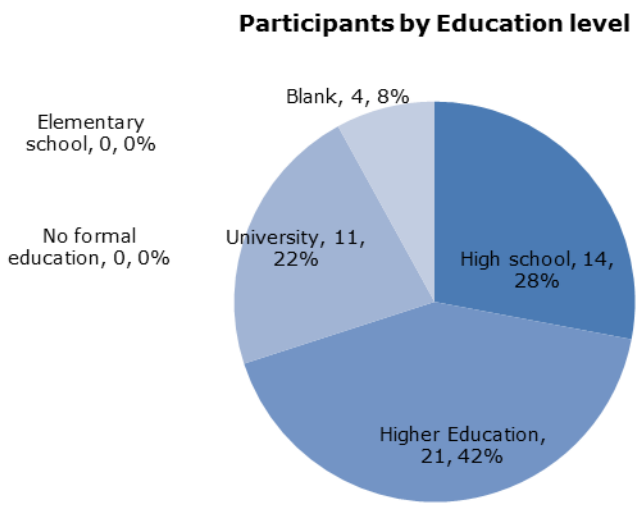

Figure 4.4 Distribution of survey participants by education level

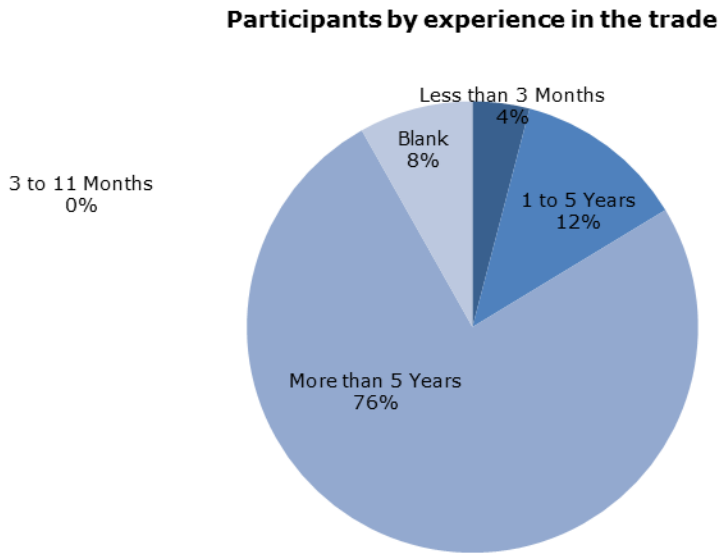

Figure 4.5 Distribution of survey participants by experience

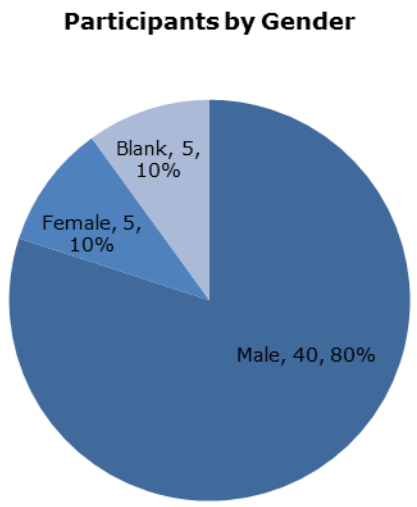

Figure 4.6 Distribution of survey participants by gender

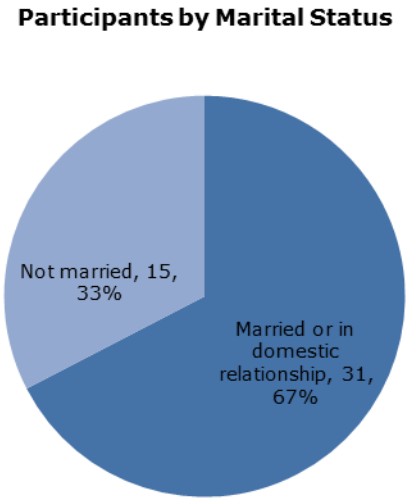

Figure 4.7 Distribution of survey participants by marital status

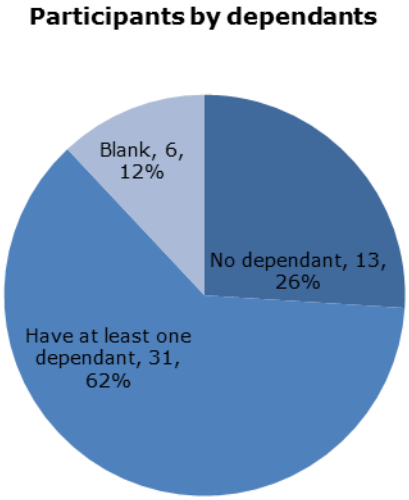

Figure 4.8 Distribution of survey participants by number of dependents

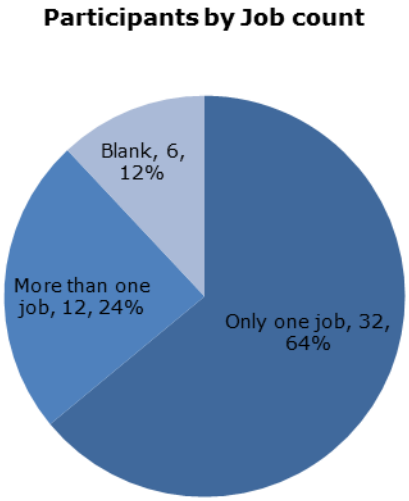

Figure 4.9 Distribution of survey participants by number of jobs

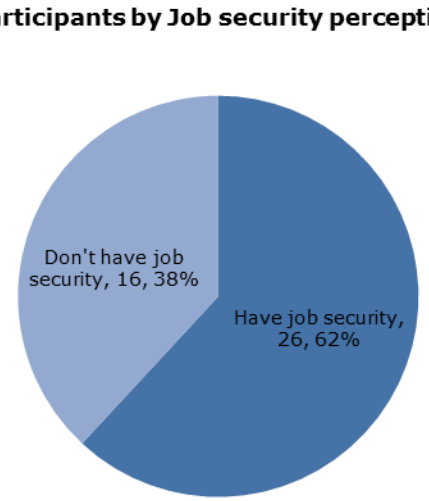

Figure 4.10 Distribution of survey participants by job security perception

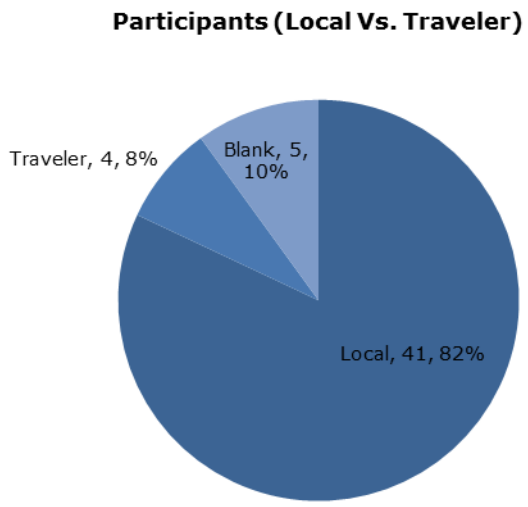

Figure 4.11 Distribution of survey participants by Local Vs. Traveler

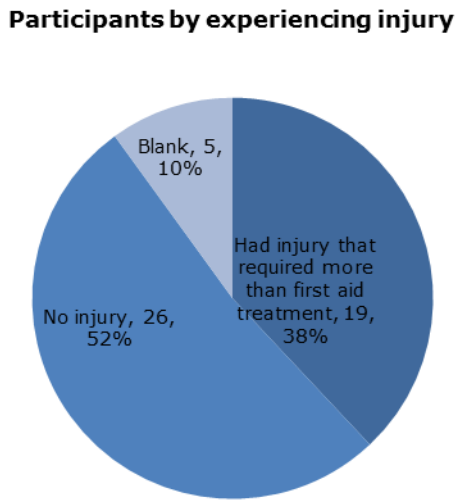

Figure 4.12 Distribution of survey participants by injury experience

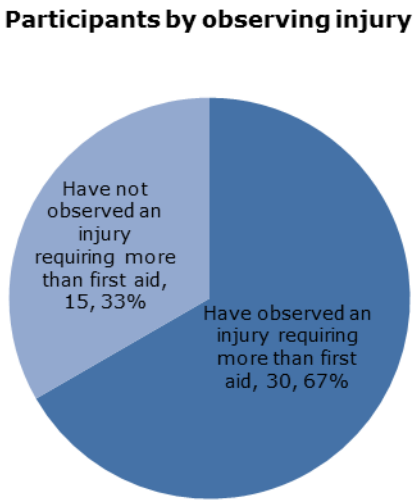

Figure 4.13 Distribution of survey participants by injuries observed

4.2 Response Processing

In this section, the process to prepare the data for analysis is discussed. This section includes the response processing for personal factors (part 1 of the survey), risk perception (part 2 of the survey), hazard identification (part 3 of the survey), and safety knowledge (part 4 of the survey).

4.2.1 Factors Influencing Safety Performance

As mentioned in earlier sections, participants were asked to give their responses in four main sections and demographic information. In the first section parts A and B, participants were asked to give their

opinion about the impact of personal factors on safety performance by choosing any of the following responses (Likert scale):

- Completely Disagree (value = 1)
- Disagree (value = 2)
- Neutral (value = 3)
- Agree (value = 4)
- Completely Agree (value = 5)

As seen above, after the responses were obtained a value one to five was assigned to the categories. A sample response and conversion for analysis is shown in Figure 4.14. and Figure 4.15 for parts A and B, respectively.

Statement regarding influence on employee safety performance	Completely Disagree	Disagree	Neutral	Agree	Completely Agree
Personal and demographic attributes (such as age, gender, experience, etc.) of an employee affects the employee's safety performance				X	
An employee's risk perception affects the employee's safety performance					X
An employee's level of safety knowledge affects the employee's safety performance					X
The ability of an employee to identify safety hazards influences the employee's safety performance					X

Figure 4.14 Sample of response for section 1 part A of the survey

Statement regarding influence of personal attributes on safety performance	Completely Disagree	Disagree	Neutral	Agree	Completely Agree
The **age** of an employee influences the employee's safety performance				X	
An employee's **gender** influences the employee's safety performance			X		
An employee's **marital status** influences the employee's safety performance				X	
Having dependents (e.g., children) influences an employee's safety performance				X	
An employee's level of **work experience** in the trade influences the employee's safety performance					X
An employee's level of **education** influences the employee's safety performance		X			
An employee's **length of service with the company** influences the employee's safety performance			X		
Having more than one job influences an employee's safety performance			X		
An employee's safety performance is influenced by whether or not the employee **has experienced injuries that required more than first aid treatment in the past**					X
An employee's safety performance is influenced by whether or not the employee **has observed injuries to other workers that required more than first aid treatment in the past**					X
Having **formal safety training** like OSHA 10-hour training influences the an employee's safety performance				X	
An employee's **perception of their job security** influences the employee's safety performance		X			
Being a **local worker or a traveler** influences an employee's safety performance		X			
Being a **member of a labor union** influences an employee's safety performance		X			
The **job level of the employee** (for example, apprentice, foreman, etc.) influences the employee's safety performance				X	

Figure 4.15 Sample of responses for section 1 part B of the survey

In part C of the personal factors section, employees were asked to give their opinion regarding the influence of each personal factor. For instance, job level factor had five sub-categories: apprentice, journeyman, foreman/lead, supervisors/superintendents/project managers/engineers, and safety personnel. Employees were asked to use the scale shown in Table 4.2. To prepare the data for the analysis, this scale was changed to the original five point Likert scale ranging from one to five. The conversion is shown in the Table 4.2.

Table 4.2 Conversion of rating for analysis

Impact on safety performance	**Strongly Negative**	**Negative**	**Neutral (Not affecting safety performance)**	**Positive**	**Strongly Positive**
Rating	**-2**	**-1**	**0**	**1**	**2**
Converted rating for analysis	**1**	**2**	**3**	**4**	**5**

Figure 4.6 presents a sample response from the survey.

Age (years)	18-19	20-24	25-34	35-44	45-54	55-64	65 and over
Rating	-2	-1	0	1	2	2	2

Length of service with the company	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Rating	0	0	0	0

Experience in the trade	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Rating	-2	-1	0	1

Education Level	No Formal Education	Elementary School	High School	Higher Education	University
Rating	0	0	0	0	0

Job Level	Apprentice	Journeyman	Foreman/Lead	Supervisors/Superintendent/PM
Rating	-2	1	2	2

Gender	Male	Female
Rating	0	1

Marital Status	Married or in domestic relationship	Not married
Rating	1	-1

Dependents	No dependents	Has at least one dependent
Rating	-1	2

Multi-Jobs	One Job	More than one job
Rating	0	0

Employee has had an injury that required more than first aid treatment	Yes	No
Rating	2	-1

Employee has observed an injury that required more than first aid treatment	Yes	No
Rating	1	-1

Job security perception	Employee feels his/her job is secure	Employee feels that his/her job is not secure
Rating	0	0

Local vs. Traveler	Local	Traveler
Rating	0	0

Union status	Union	Non
Rating	0	0

Figure 4.16 Sample response of survey for section 1 part c

4.2.2 Risk Perception

In the risk perception part of the survey, the goal was to evaluate the perception of the employees with regards to risk of selected work scenarios. For this purpose, an objective method to quantify risk, described in the methodology section, was incorporated. In order to capture the employee's risk perception, frequencies of incidents for different severity levels were solicited. The frequency scale was adopted from Dharmapalan (2011) and is shown in Table 2.5. This scale assumes 45 hours of work per week and 50 weeks per year in order to calculate the incidents per worker hour.

Table 4.3 Frequency value conversion adopted from Dharmapalan (2011)

Frequency scale value	Original range	Worker-hours per incident	Incidents per worker-hour
10	1hr	1	1.00E+00
9	1day	9	1.11E-01
8	1week	45	2.22E-02
7	1month	189	5.29E-03
6	6month	1134	8.82E-04
5	1year	2250	4.44E-04
4	5years	11250	8.89E-05
3	10years	22500	4.44E-05
2	50years	112500	8.89E-06
1	Negligible	Negligible	0.00E+00

For the above mentioned table, Hallowell (2010) emphasized the importance of consistent frequency and severity scales for an objective evaluation of risk.

Severity levels for this research and the values associated with each level were calculated and explained in the methodology section. These values are shown in Table 4.4.

Table 4.4 Geometric impact factor for the current research

Severity category	Geometric impact factor for the current research
Near Miss	1
Non-hospitalized injury	30.57
Hospitalized injury	506.67
Fatality	26,214

Consequently, unit risk is calculated by multiplying the severity values (S/incident) to the corresponding frequency values (incident/w-h). The total risk for each scenario is the sum of the unit risks from each severity level. This process can be summarized in the following Equation:

$$Scenario\ total\ Risk = \sum_{Nearmiss}^{Fatality} Frequency_i \times Severity_i \qquad (4.1)$$

A sample response for the response (mechanical scenarios) is shown in Figure 4.17 and calculation of risk for one severity (non-hospitalized injury) is demonstrated in Table 4.5 respectively.

No.	Scenario	Frequency of Injury			
		Near Miss	Non-Hospitalized Injury	Hospitalized Injury	Fatality
1	A sheetmetal craft employee is installing a control box in a ceiling grid while standing on a 10-ft tall ladder.	5	3	2	2
2	A pipefitter is installing unsecured, overhead, 2-inch diameter steel pipe in 10-ft long sections. Work is being done from a scissor lift.	5	3	2	2
3	A mechanical craft employee is using a Sawzall to cut a hole in a wall to install a chilled water line. The employee did not check whether utilities were present in the wall.	5	2	2	1

Figure 4.17 Sample response for mechanical trade scenarios

Table 4.5 Calculation of risk for non-hospitalized severity injury

Scenario #	**Input frequency**	**Incident per worker hour (F)**	**Severity for non-hospitalized injury (S)**	**Risk (S*F)**
1	3	4.44E-05	30.57	1.36E-03
2	3	4.44E-05	30.57	1.36E-03
3	2	8.89E-06	30.57	2.72E-04

In order to validate the results with objective data, risk scenarios should be calculated based on an objective source. For this research, as shown in the methodology section, frequency levels were obtained from OSHA's incident records (OSHA 2015b). As shown in Table 3.8 and 3.9, the injury causes and their frequency in the past ten years were obtained. Next, the worker hours for the mechanical and

electrical trade was obtained from OSHA and are presented in Table 4.6 (OSHA 2015C)

Table 4.6 Hours worked for mechanical and electrical trade obtained from OSHA (2015C)

	Mechanical Trade	**Electrical Trade**
Year	Hours worked (in millions)	Hours worked (in millions)
2012	1692	1502
2011	1690	1502
2010	1810	1502
2009	1759	1502
2008	2005	1763
2007	2241	1849
2006	2170	1778
2005	2372	1917
2004	2219	1757
2003	2126	1742
2002	2036	1940

Thus, total number of hours worked in the ten years under consideration for the mechanical and electrical trades are 22,119,500,000 and 18,753,250,000 respectively. When developing the risk scenarios with the expert panel, each scenario was associated with one or more injury cause. The injury causes and their risk based on the actual worked hours are presented in Tables 4.7 and 4.8 (SIC 1711 and SIC 1731).

Table 4.7 Number of injury causes and their calculated risk for each severity level (SIC1711)

#	Injury cause	Non-hospitalized injury	Hospitalized injury	Fatality	Risk non-hospitalized Injury	Risk hospitalized injury	Risk fatality	Risk total
1	Animal/Insect attack	0	1	0	0.00E+00	2.29E-08	0.00E+00	2.29E-08
2	Asphyxiation/inhalation of toxic vapor	12	12	12	1.66E-08	2.75E-07	1.42E-05	1.45E-05
3	Caught in/Struck/Cut by building equipment	5	9	0	6.91E-09	2.06E-07	0.00E+00	2.13E-07
4	Caught in/Struck/Cut by Tools (Tool Use)	10	19	1	1.38E-08	4.35E-07	1.19E-06	1.63E-06
5	Caught between Materials	6	3	0	8.29E-09	6.87E-08	0.00E+00	7.70E-08
6	Caught in stationary equipment	4	8	1	5.53E-09	1.83E-07	1.19E-06	1.37E-06
7	Chemical Burn/Chemical Exposure	0	5	0	0.00E+00	1.15E-07	0.00E+00	1.15E-07
8	Collapse of structure	0	4	5	0.00E+00	9.16E-08	5.93E-06	6.02E-06
9	Crushed/run-over by construction equipment during	0	2	3	0.00E+00	4.58E-08	3.56E-06	3.60E-06
10	Crushed/run-over by highway vehicle	0	1	1	0.00E+00	2.29E-08	1.19E-06	1.21E-06
11	Crushed/run-over of non-operator by operating cons	2	8	8	2.76E-09	1.83E-07	9.48E-06	9.67E-06
12	Crushed/run-over/trapped of operator by operating	0	4	10	0.00E+00	9.16E-08	1.19E-05	1.19E-05
13	Cut/Laceration Other	1	2	0	1.38E-09	4.58E-08	0.00E+00	4.72E-08
14	Cuts by Materials	1	2	0	1.38E-09	4.58E-08	0.00E+00	4.72E-08
16	Drown, non-lethal fall	0	1	0	0.00E+00	2.29E-08	0.00E+00	2.29E-08
17	Electric Shock from Faulty Equipment (Building Equipment)	0	4	5	0.00E+00	9.16E-08	5.93E-06	6.02E-06
18	Electric shock, other and unknown cause	5	4	17	6.91E-09	9.16E-08	2.01E-05	2.02E-05
19	Electrical Burn/Arc Flash	1	3	0	1.38E-09	6.87E-08	0.00E+00	7.01E-08
20	Electrocution by equipment contacting wire	0	1	7	0.00E+00	2.29E-08	8.30E-06	8.32E-06
21	Electrocution by touching exposed wire/source	0	1	21	0.00E+00	2.29E-08	2.49E-05	2.49E-05
22	Electrocution from equipment installation/tool use	0	0	10	0.00E+00	0.00E+00	1.19E-05	1.19E-05
23	Fall from roof	4	30	15	5.53E-09	6.87E-07	1.78E-05	1.85E-05

Table 4.7 (Continued)

#	Injury cause	Non-hospitalized injury	Hospitalized injury	Fatality	Risk non hospitalized Injury	Risk hospitalized injury	Risk fatality	Risk total
24	Fall from vehicle (vehicle/construction equipment)	0	4	2	0.00E+00	9.16E-08	2.37E-06	2.46E-06
25	Fall from/with bucket (aerial lift/basket)	1	8	7	1.38E-09	1.83E-07	8.30E-06	8.48E-06
26	Fall from/with ladder	5	80	39	6.91E-09	1.83E-06	4.62E-05	4.81E-05
27	Fall from/with platform catwalk (attached to structure)	2	3	5	2.76E-09	6.87E-08	5.93E-06	6.00E-06
28	Fall from/with scaffold	0	6	8	0.00E+00	1.37E-07	9.48E-06	9.62E-06
29	Fall from/with structure (other than roof)	2	18	10	2.76E-09	4.12E-07	1.19E-05	1.23E-05
30	Fall on the same level (Slip\Trip)	0	3	0	0.00E+00	6.87E-08	0.00E+00	6.87E-08
31	Fall through opening (other than roof)	3	20	11	4.15E-09	4.58E-07	1.30E-05	1.35E-05
32	Fall, other	3	20	8	4.15E-09	4.58E-07	9.48E-06	9.94E-06
33	Fire/explosion	9	34	17	1.24E-08	7.79E-07	2.01E-05	2.09E-05
34	Heart Attack	0	0	16	0.00E+00	0.00E+00	1.90E-05	1.90E-05
35	Heat/hypothermia	0	2	1	0.00E+00	4.58E-08	1.19E-06	1.23E-06
36	Lifting operations	0	1	1	0.00E+00	2.29E-08	1.19E-06	1.21E-06
37	Natural Disaster	0	0	1	0.00E+00	0.00E+00	1.19E-06	1.19E-06
38	Steam/Hot water burn	8	9	0	1.11E-08	2.06E-07	0.00E+00	2.17E-07
39	Struck by falling object/projectile	10	33	21	1.38E-08	7.56E-07	2.49E-05	2.57E-05
40	Trench collapse	5	18	23	6.91E-09	4.12E-07	2.73E-05	2.77E-05
41	Unknown	1	0	6	1.38E-09	0.00E+00	7.11E-06	7.11E-06
42	Unloading-loading equipment/material (except by crane)	0	0	3	0.00E+00	0.00E+00	3.56E-06	3.56E-06
43	Wall (earthen) collapse	0	1	3	0.00E+00	2.29E-08	3.56E-06	3.58E-06
44	Work Place Violence	0	0	1	0.00E+00	0.00E+00	1.19E-06	1.19E-06

Table 4.8 Number of injury causes and their calculated risk for each severity level (SIC1731)

#	Injury cause	Non-hospitalized injury	Hospitalized injury	Fatality	Risk non hospitalized Injury	Risk hospitalized injury	Risk fatality	Risk total
1	Animal/Insect attack	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	Asphyxiation/inhalation of toxic vapor	0	1	7	0.00E+00	2.70E-08	9.78E-06	9.81E-06
3	Caught in/Struck/Cut by building equipment	1	2	2	1.63E-09	5.40E-08	2.80E-06	2.85E-06
4	Caught in/Struck/Cut by Tools (Tool Use)	4	7	0	6.52E-09	1.89E-07	0.00E+00	1.96E-07
5	Caught between Materials	4	4	0	6.52E-09	1.08E-07	0.00E+00	1.15E-07
6	Caught in stationary equipment	1	6	3	1.63E-09	1.62E-07	4.19E-06	4.36E-06
7	Chemical Burn/Chemical Exposure	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	Collapse of structure	2	5	2	3.26E-09	1.35E-07	2.80E-06	2.93E-06
9	Crushed/run-over by construction equipment during	0	3	3	0.00E+00	8.11E-08	4.19E-06	4.27E-06
10	Crushed/run-over by highway vehicle	0	8	14	0.00E+00	2.16E-07	1.96E-05	1.98E-05
11	Crushed/run-over of non-operator by operating cons	0	6	9	0.00E+00	1.62E-07	1.26E-05	1.27E-05
12	Crushed/run-over/trapped of operator by operating	1	5	19	1.63E-09	1.35E-07	2.66E-05	2.67E-05
13	Cut/Laceration Other	1	1	0	1.63E-09	2.70E-08	0.00E+00	2.86E-08
14	Cuts by Materials	0	1	0	0.00E+00	2.70E-08	0.00E+00	2.70E-08
16	Drown	0	0	1	0.00E+00	0.00E+00	1.40E-06	1.40E-06
17	Drown, non-lethal fall	0	1	0	0.00E+00	2.70E-08	0.00E+00	2.70E-08
18	Electric Shock from Faulty Equipment (Building Equipment)	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19	Electric shock, other and unknown cause	18	67	22	2.93E-08	1.81E-06	3.08E-05	3.26E-05
20	Electrical Burn/Arc Flash	9	41	5	1.47E-08	1.11E-06	6.99E-06	8.11E-06
21	Electrocution by equipment contacting wire	3	15	22	4.89E-09	4.05E-07	3.08E-05	3.12E-05
22	Electrocution by touching exposed wire/source	3	35	148	4.89E-09	9.46E-07	2.07E-04	2.08E-04
23	Electrocution from equipment installation/tool use	1	18	36	1.63E-09	4.86E-07	5.03E-05	5.08E-05
24	Fall from roof	0	10	7	0.00E+00	2.70E-07	9.78E-06	1.01E-05

Table 4.8 (Continued)

#	Injury cause	Non-hospitalized injury	Hospitalized injury	Fatality	Risk non hospitalized Injury	Risk hospitalized injury	Risk fatality	Risk total
25	Fall from vehicle (vehicle/construction equipment)	0	5	5	0.00E+00	1.35E-07	6.99E-06	7.12E-06
26	Fall from/with bucket (aerial lift/basket)	1	16	24	1.63E-09	4.32E-07	3.35E-05	3.40E-05
27	Fall from/with ladder	9	86	45	1.47E-08	2.32E-06	6.29E-05	6.52E-05
28	Fall from/with platform catwalk (attached to structure	1	5	4	1.63E-09	1.35E-07	5.59E-06	5.73E-06
29	Fall from/with scaffold	0	10	9	0.00E+00	2.70E-07	1.26E-05	1.29E-05
30	Fall from/with structure (other than roof)	2	22	7	3.26E-09	5.94E-07	9.78E-06	1.04E-05
31	Fall on the same level (Slip\Trip)	0	1	0	0.00E+00	2.70E-08	0.00E+00	2.70E-08
32	Fall through opening (other than roof)	1	7	3	1.63E-09	1.89E-07	4.19E-06	4.38E-06
33	Fall, other	3	33	18	4.89E-09	8.92E-07	2.52E-05	2.61E-05
34	Fire/explosion	7	54	13	1.14E-08	1.46E-06	1.82E-05	1.96E-05
35	Heart Attack	1	0	23	1.63E-09	0.00E+00	3.22E-05	3.22E-05
36	Heat/hypothermia	1	2	1	1.63E-09	5.40E-08	1.40E-06	1.45E-06
37	Lifting operations	1	6	2	1.63E-09	1.62E-07	2.80E-06	2.96E-06
38	Motor Vehicle Accident	0	0	3	0.00E+00	0.00E+00	4.19E-06	4.19E-06
39	Natural Disaster	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
40	Other	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00
41	Steam/Hot water burn	0	1	0	0.00E+00	2.70E-08	0.00E+00	2.70E-08
42	Struck by falling object/projectile	5	25	16	8.15E-09	6.75E-07	2.24E-05	2.30E-05
43	Trench collapse	0	0	4	0.00E+00	0.00E+00	5.59E-06	5.59E-06
44	Unknown	0	0	5	0.00E+00	0.00E+00	6.99E-06	6.99E-06
45	Unloading-loading equipment/material (except by cr	1	0	0	1.63E-09	0.00E+00	0.00E+00	1.63E-09
46	Wall (earthen) collapse	0	0	1	0.00E+00	0.00E+00	1.40E-06	1.40E-06
47	Work Place Violence	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00

As discussed previously, each scenario was associated with one or more of the injury causes identified by the expert panel. Thus, it was possible to calculate the risk of each scenario using the actual available data. The following equation shows the calculation of the risk based on the values that were calculated in the previous tables:

$$Risk\ Scenario = \sum_i Total\ Unit\ Risk_i \qquad (4.2)$$

where i is the associated injury cause.

Tables 4.9 and 4.10 show the associated injury causes' number from Tables 4.8 and 4.7 for each scenario and the calculated risk.

Table 4.9 Risk scenarios and associated injury causes for mechanical trade

No.	Scenario	Associated injury causes	Calculated risk based on OSHA
1	A sheetmetal craft employee is installing a control box in a ceiling grid while standing on a 10-ft tall ladder.	4,14,26	4.97E-05
2	A pipefitter is installing unsecured, overhead, 2-inch diameter steel pipe in 10-ft long sections. Work is being done from a scissor lift.	25,39,36,4	3.70E-05
3	A mechanical craft employee is using a Sawzall to cut a hole in a wall to install a chilled water line. The employee did not check whether utilities were present in the wall.	4,20	9.95E-06
4	A pipefitter installed a 6-inch PVC line with a temporary cap on the end, and now needs to test the system by pressurizing it.	39,4,	2.73E-05
5	A service mechanic is conducting maintenance on a rooftop air handler unit which is located 3 feet from the edge of the roof. The roof has a low parapet.	23,17,3	2.47E-05
6	A plumber is using a portable band saw to cut overhead 2-inch steel pipe	4	1.63E-06
7	A pipefitter is working in a 2-ft wide by 6-ft tall tunnel underneath a building. The worker is welding steel pipe to install ammonia lines.	2 ,33	3.55E-05
8	A pipefitter is operating a pipe threading machine to thread a 3-inch steel sprinkler line.	6	1.37E-06
9	A plumber is installing an underground sewer line in a 4-ft deep excavation on a small site. A backhoe is working on a trenching operation nearby.	9, 40, 4	3.29E-05
10	A mechanical craft employee is moving pipe on a summer day in a hot climate area.	35,36,5	2.52E-06
11	A service technician is repairing a steam pipe hanger on a live line.	38,4	1.85E-06

Table 4.10 Risk scenarios and associated injury causes for electrical trade

No.	Scenario	Associated injury causes	Calculated risk based on OSHA
1	An electrician is diagnosing a heating unit panel (480V) in a ceiling grid while the unit is operating. The work is being done from a scissor lift.	18,22,20	2.49E-04
2	An electrician is diagnosing a heating unit panel (480V) in a ceiling grid while the unit is operating. The work is being done from a ladder.	18,22,27,19	3.06E-04
3	An electrician is working on a de-energized panel while other trades are installing conduit overhead from a platform nearby.	42,4,	2.32E-05
4	An owner requests an electrician to secure an old panel cover and door while it is energized. The condition of the panel inside is unknown to the electrician.	22,18,20,19	2.16E-04
5	An electrician is demolishing an old light fixture on a wall and replacing it with a new fixture.	4, 5.22,14	2.08E-04
6	An electrician is cutting an unsecured conduit using a portable band saw.	4,13, 5	3.39E-07
7	An electrician is placing underground conduit while heavy equipment operates nearby in the surrounding area.	9,11,5	1.71E-05
8	An electrician is working from a ladder near an elevator shaft opening. The shaft opening has top and mid-guardrails surrounding the opening.	27,33	9.13E-05
9	An electrician is installing hangers for conduit on roof during the summertime. The weather is hot, and fall protection provided around roof edge	36,42,4	2.47E-05
10	A data line installer is moving materials with a cart out of a construction storage unit.	45,5,	1.16E-07
11	A data craft employee is pulling wire for the construction of a data center.	42	2.30E-05

4.2.3 Hazard Identification

This section presents the results of the survey in which participants were presented with different pictures and asked to write down the hazards (H_H^I), bad safety practices (H_{BP}^I), and good safety practices (H_{PP}^I). In order to obtain the Multi-Layer Hazard Index (MLHI), which was defined in the methodology section and is shown below in Equation 4.3, the total number of items in each category was developed based on the expert panel's input

$$MLHI = \frac{H_H^I + H_{BP}^I + H_{PP}^I}{+H_H^T + H_{BP}^T + H_{PP}^T} \qquad (4.3)$$

Table 4.11 presents the baseline scores of expert panel for the hazard identification section of the survey.

Table 4.11 Number of identified hazards, bad practices, and good practices based on expert panel's input

No.	Type	Identified items	Number of items
Scenario 1	**Hazards Present**	Struck by, caught in or between	2
	Bad Safety Practices	No spotter, no warning lines, limited egress, limited swing area	4
	Good Safety Practices	Barricade	1
Scenario 2	**Hazards Present**	Trip hazard, puncture hazard, ergonomic hazard (lifting), fall hazard	4
	Bad Safety Practices	Poor housekeeping, improper cable fix, open hole, bad storage area	4
	Good Safety Practices	Cables wrapped up	1
Scenario 3	**Hazards Present**	Fall hazard, struck by hazard, electrical hazards, slip hazard	4
	Bad Safety Practices	Improper ladder location setup, no toe boards, wet floor, cables are left hanging with no sign, no netting for openings	5
	Good Safety Practices	Guardrails, danger tapes, good housekeeping, ladder setup(fully open)	4
Scenario 4	**Hazards Present**	Strain sprain hazard, caught in , struck by, fire hazard, trip hazard, electrical hazard, cut hazard	7
	Bad Safety Practices	Improper posture, unsecured material, no fire extinguisher, housekeeping	4
	Good Safety Practices	PPE, saw guard, tool belt	3
Scenario 5	**Hazards Present**	Electrical hazard, fall hazard, struck by hazard, caught in ore between	4
	Bad Safety Practices	No spotter, no barricade, working close to overhead power line, no tag lines, worker on the crane	5
	Good Safety Practices	Outrigger setup, rigging setup, PPE	3

Table 4.11 (Continued)

No.	Type	Identified items	Number of items
Scenario 6	**Hazards Present**	Fall hazard, struck by hazard, slip trip hazard	3
	Bad Safety Practices	Improper scaffold, no fall protection, to guardrail, no PPE, no warning lines, housekeeping , standing under the work area	7
	Good Safety Practices	Spotter, tool belt	2
Scenario 7	**Hazards Present**	Electric hazard, fire hazard, caught between, trip hazards, cuts	5
	Bad Safety Practices	Exposed wiring, improper box setup, no covers, no GFCI	4
	Good Safety Practices	Fire protection, extension cord is a proper type	2
Scenario 8	**Hazards Present**	Caught in, cut, struck by, electrical inhalation, trip hazard, heavy objects (lifting)	6
	Bad Safety Practices	No wet method, no guard on pulley, guard not locked in place, poor housekeeping, no face shield is visible	5
	Good Safety Practices	PPE, using a table work station, disconnect switch	3

The researcher examined all of the participant responses and, after comparing them with those from the expert panel, the number identified in each category for each scenario was obtained. In the next step the hazard index introduced in the methodology is calculated for each response to be used in the analysis section.

4.2.4 Safety Knowledge

In this part of the survey, safety questions were presented to the employees. The author graded each response and a score (percentage of correct answers to all questions) was associated with each participant. The correct answer for each question is available in Appendix I. Thirteen multiple choice questions were contained within the knowledge test. When grading, the total number of correct answers was recorded and divided by 13 (total number of questions) to obtain their test scores. A sample response from field is shown in Figure 4.18.

1. **One of the main responsibilities employers have under OSHA is to:**
   a) Provide training required by OSHA standards.
   b) Reduce air pollution in the environment.
   c) Conduct energy audits.
   d) Notify OSHA of any workplace injury or illness.
2. **In general, fall protection must be provided to construction workers who are working on surfaces with unprotected sides and edges which are ____ above the lower level:**
   a) 3 feet b) 4 feet c) 6 feet d) 10 feet
3. **A ground fault circuit interrupter (GFCI):**
   a) Detects ground faults and interrupts the flow of electric current, and is designed to protect the worker by limiting the duration of an electrical shock.
   b) Detects ground faults and interrupts the electric source thus, it disables the equipment that is attached; however, the worker is still exposed to electrocution.
   c) A tool used to determine if a power system is properly grounded.

Figure 4.18 A sample of safety knowledge test responses and grading

5 Analysis and Discussion

This section presents the analysis of the processed data in the Results section and has two primary goals. First, it aims to answer the following research questions:

1. What are the frequency and probability of incident causes for specialty trade contractors?
2. Are there any correlations between safety knowledge, hazard identification, and risk perception of employees?
3. Do personal demographic factors affect the safety knowledge, hazard identification, and risk perception of employees?
4. Do workers in the construction industry have a higher or lower risk perception of activities compared to the actual risk of injuries recorded by OSHA?

The second goal is to create the assessment tool as one of the primary objectives of this thesis. To achieve these goals, first a statistical analysis of the data was conducted to compare the different factors and responses of different demographic groups. Next, these results were discussed and compared to previous studies. Lastly, the assessment tool is presented and the applications are discussed.

5.1 Statistical Analysis and Discussion

For exploration purposes, data were processed in Microsoft Excel® to show the average value of responses for each factor and sub-factor for the expert panel and survey respondents. Next, in order to check the statistical significant differences between the demographic groups, SPSS® was used. The following sections explain the analysis and summarize the results.

5.1.1 Exploratory data analysis

In the first section of the survey, participants were asked to give their responses regarding the influence of the following factors: Personal characteristics, Risk perception, Safety knowledge, and Hazard identification. Figure 5.1 shows the responses based on a Likert scale.

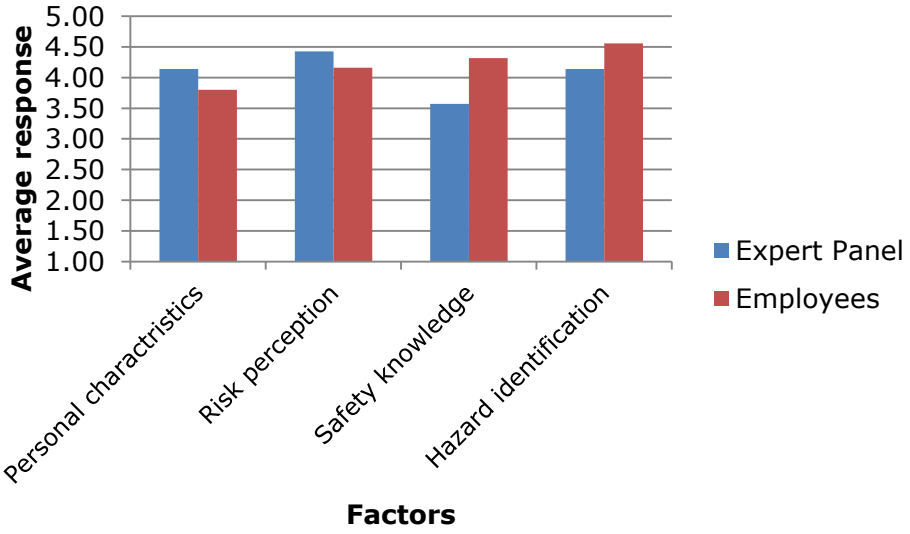

Figure 5.1 Influence of factors on safety performance of individuals based on survey

In this Figure it can be seen that all of the factors have a value of at least three and close to four which indicates the importance of these factors on impacting the safety performance of individuals. It is evident from this graph that Hazard identification and risk perception had the highest scores. This indicates that the perception of field employees are in line with previous research that emphasizes the importance of hazard identification (Adbelhamid et al. 2011; Lu et al. 2011; Albert et al. 2014) and risk perception (Howell et al. 2002; Carter and Smith 2006; Tixier et al. 2014; Floyd et al. 2014).

Next, Figure 5.2 shows the average of the responses (using a Likert scale) for the sub-categories of personal factors.

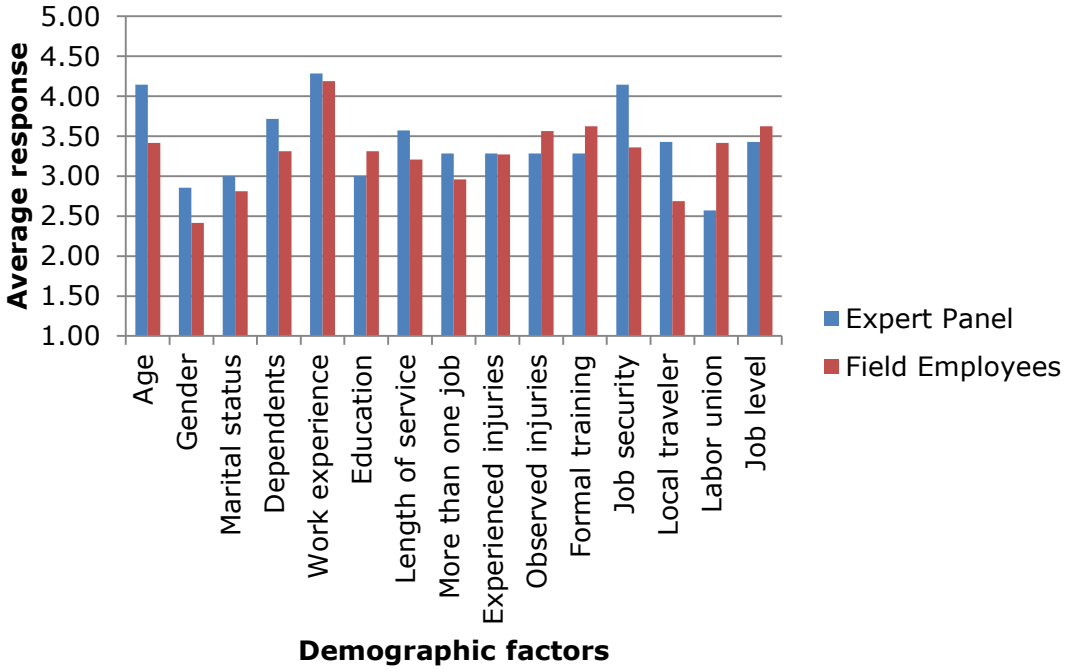

Figure 5.2 Average of responses (Likert scale) on influence of sub-categories in personal factors

Based on the data, three factors were rated lower than the others, which meant that survey participants think that those factors do not affect the safety of individuals as much as the others. These factors were Gender, Marital Status, and Local vs Travelers (field perception only). Moreover, Union Status was dropped from the analysis due to not having participants from non-union shops. There is no unanimous finding on the influence of age on safety. For instance, Bosak et al. (2013) found a small correlation between age and risk behavior; however, Cohen (1977) found that employers with older

employees have better safety performance, and Siu et al. (2003) did not find a relationship between safety, age, and incident rates. Although the respondents believe that gender has an insignificant effect on safety, previous research concluded that female employees have lower incident rates and better safety performance (Villanueva and Garcia 2011; Feyer et al. 2001; Dimich-Ward et al. 2004; European Commission 2004; Lin et al. 2008; Shendell et al. 2013).

Figures 5.3 to 5.8 show the mean responses from the survey respondents regarding the effect of each category of personal sub-factors on safety.

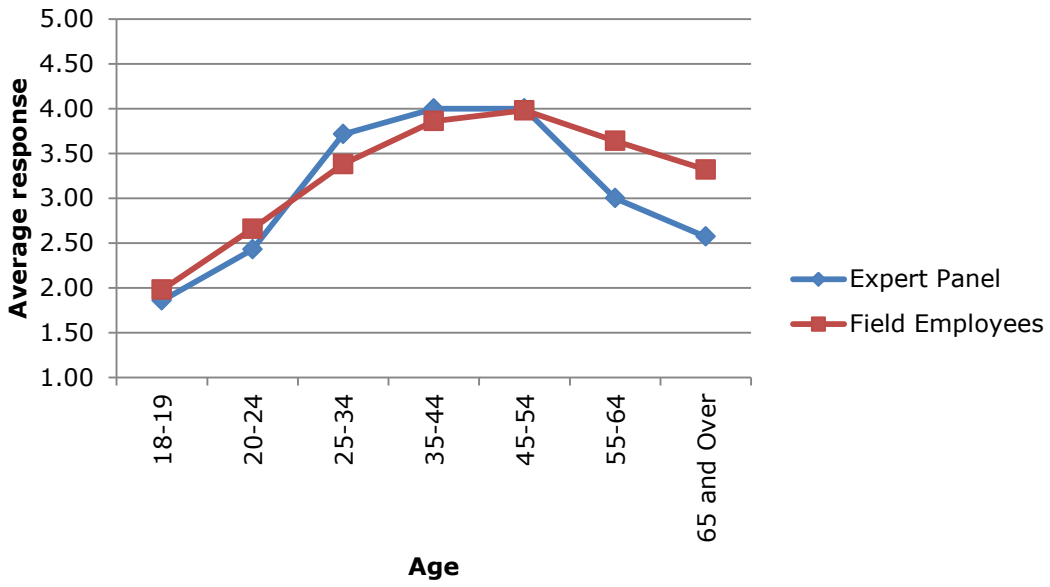

Figure 5.3 Respondent rating of different Age categories

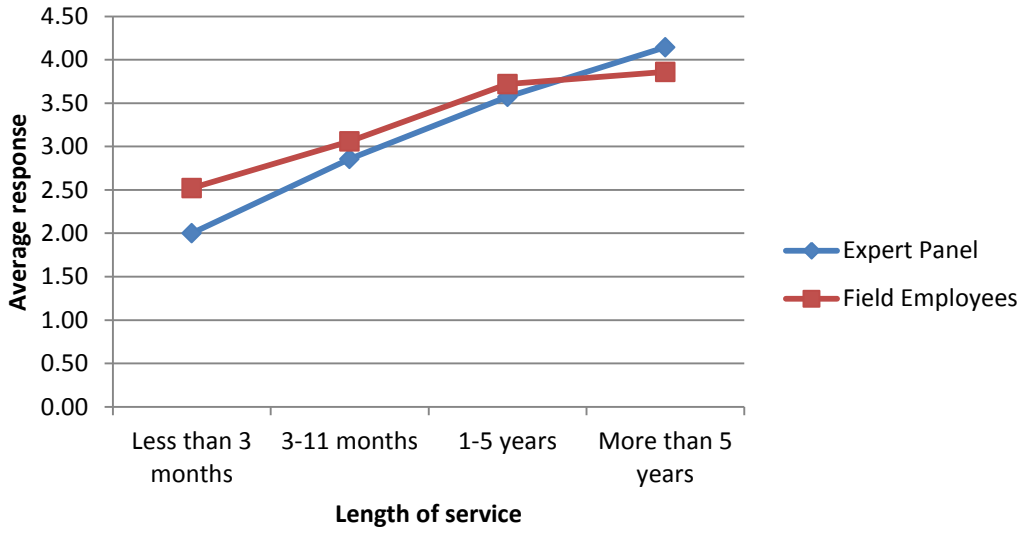

Figure 5.4 Respondent rating of different Length of service categories

From Figure 5.4 it is derived that employees think that workers with shorter tenure would more likely get hurt. A study conducted by Lin et al. (2008) concluded that fatalities were more common in the first year of employment which is in line with the findings of the present research.

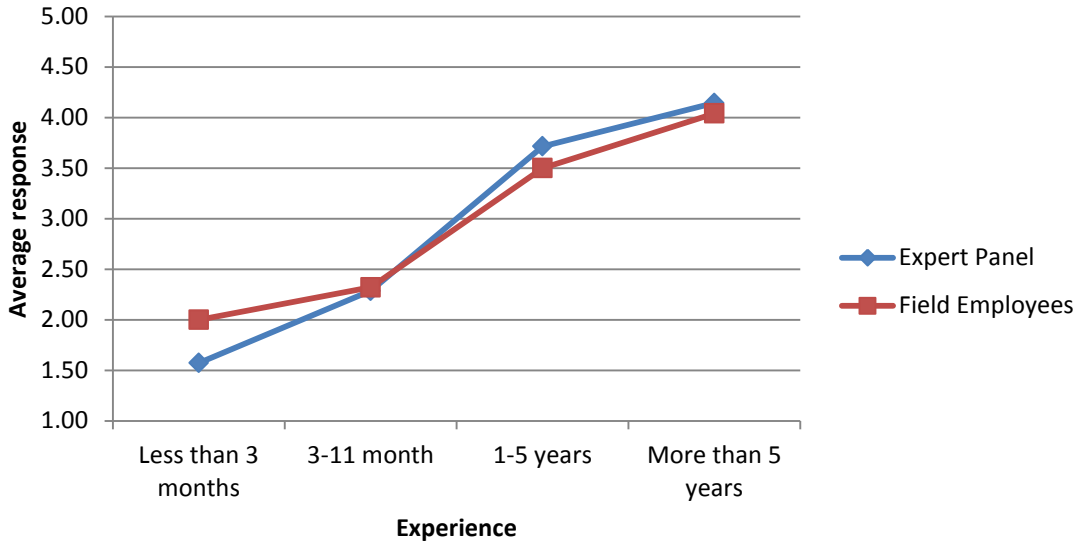

Figure 5.5 Respondents rating of different level of Experience categories

With regards to the level of experience, the findings of Vinodkumar and Bhasi (2009) were not conclusive as the level of experience was correlated with the age. In the present research, since the majority of respondents had more than five years of experience, the responses may contain bias. The author recommends expanding the survey sample in the future to a broader range of participants.

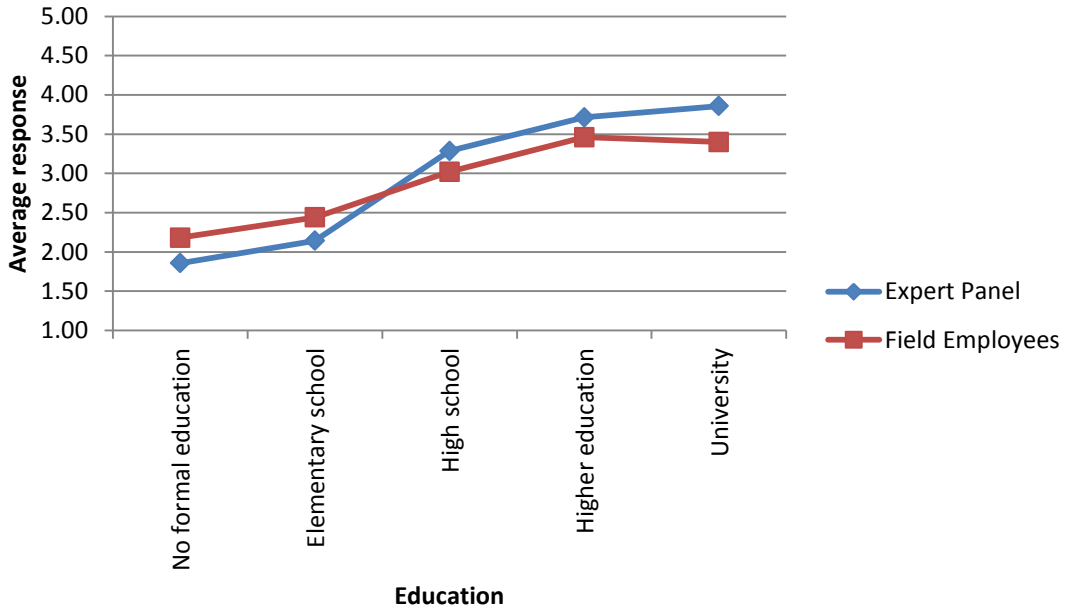

Figure 5.6 Respondent rating of different Education level categories

Fang et al. (2006), Kunar and Bhattacherjee (2006), and Ferguson et al. (1984) found that lack of formal education could result in higher risk and injury rates. These conclusions are similar to the perception of the participants regarding the influence of formal education on safety can be seen in Figure 5.6.

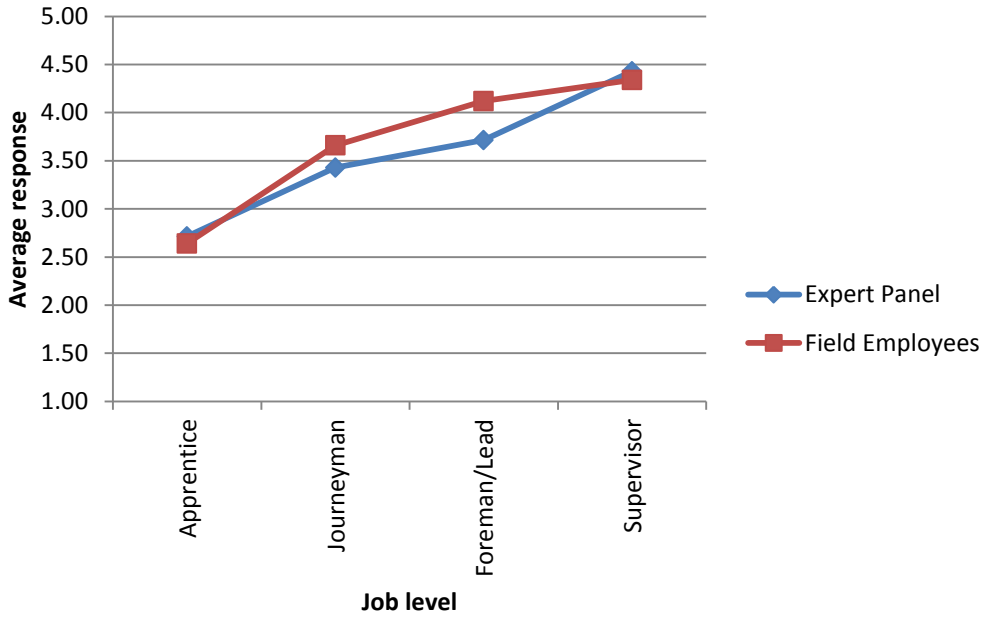

Figure 5.7 Respondent rating of different Job level categories

Studies carried out by Vinodkumar and Bhasi (2009) and Wu et al. (2007) found that higher level employees have a better attitude toward and perception of safety climate. Similarly, in the present research it was observed that employees think that higher level employees have better safety performance. This result could be due to a couple of reasons. First, usually higher level employees have more experience and training with regards to safety and have been previously exposed to several hazards. Second, employees at higher levels have more responsibility and try to set an example for the other

employees, thus people see them as more safety-conscious than other groups.

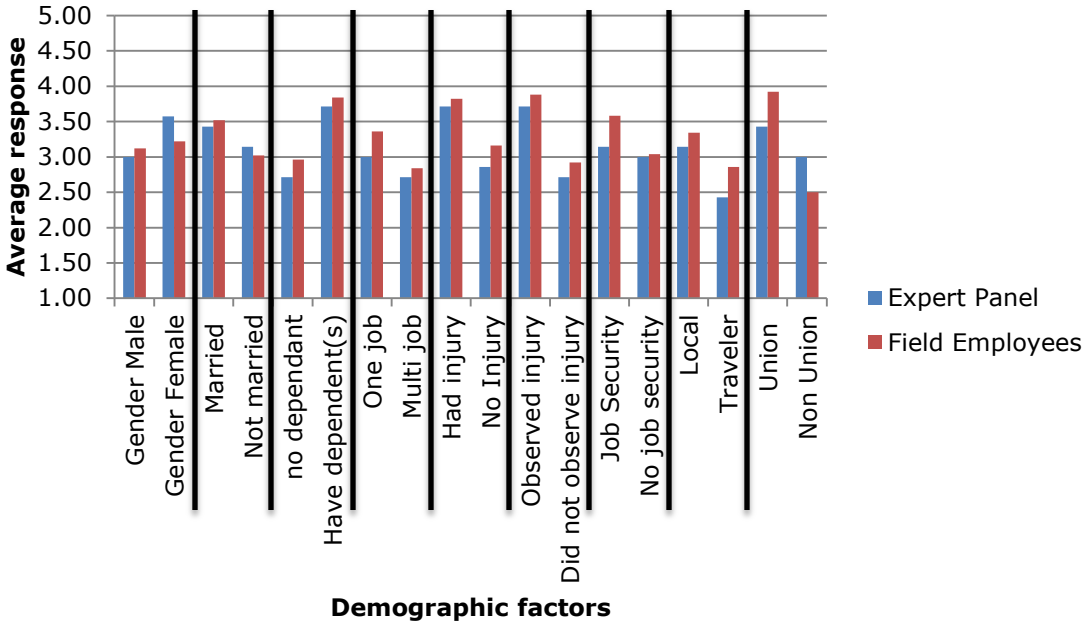

Figure 5.8 Respondent rating of different demographic categories

According to Figure 5.8, employees rated married people slightly higher than not married (respondents rate the married people slightly safer). However, both categories have values close to 3.5 or lower which indicates that it has a small contribution to potential safety performance based on the perception of respondents. In the literature, marital status, age, and having dependents have been grouped together when responding to the safety impact of these factors (Fang et al. 2006; Coudhary et al. 2009; Cohen 1977). In the mentioned

literature, it was concluded that being married, older, and having dependents are indicators of more positive attitude toward safety and people with these characteristics (more social responsibility) have better safety performance. When combining the results of this study (Figures 5.3 and 5.8) it can be concluded that employees with these three characteristics have a higher rating (safer) than their counterpart group.

5.1.2 Statistical Analysis

In order to compare the perception of different demographic groups within each of the personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test (182 dependent variables), the Kruskal Wallis test was carried out. The non-parametric method was used because the assumption of normality was not correct for some variables and there was uncertainty regarding the equality of the distances along the ordering of Likert scores. In case of the existence of any evidence for differences among categories, a non-parametric Mann-Whitney test was utilized for the dependent variable being studied. The results of the Kruskal Wallis test are presented in Appendix J1-J14. The results of the Mann-Whitney tests, which compare all possible pairs within a demographic factor, are shown in Tables 5.1 through 5.4 for four personal sub-factors (age, length of service, education, and job level). The remaining tables for the other sub-factors are available in Appendix J1-J14. In the tables below only p-values equal to or lower than 0.10 (showing some evidence of difference between sub-groups) are presented. The comparisons for which the p-values are greater than 0.10 were left blank since the higher p-values indicate that there is no evidence of a difference between sub-factors. For instance, for age group pair 2 (age 20-24)

versus age group 3 (age 25-34) there was moderate evidence (p-value =0.019) that the responses in those age groups have different perceptions about the effect of having more than 5 years of experience on safety.

Table 5.1 Comparison of the medians between age group's perception for each factor based on Mann Whitney test.

		Dependent Variable							
Factor	**Group Pairs***	**Age**	**Job Level**	**Length of service 3-11 Months**	**Experience > 5 Years**	**Level Forman Lead**	**Level Supervisor**	**Mechanical risk scenario #5 (Hospitalized Injury)**	**Hazard identification Total , Hazard Scenarios 5**
Age	2 versus 3		.024+		.019	039			
	2 versus 4		.038						
	2 versus 5								.061
	2 versus 6		.068						
	3 versus 4							.072	.012
	3 versus 5	.008	.009		.007	004	.078	.016	.007
	3 versus 6			.018	.005			.009	
	3 versus 7			.019					
	4 versus 5	.042	.010	.040			.086		
	4 versus 6			.016					.087
	5 versus 6								.028
	5 versus 7			.085			.084		

+P-value
P- value =0 - 0.01(Convincing evidence); P- value =0.011 - .05 (Moderate evidence); P- value =0.051 - .010 (Suggestive, but inconclusive evidence);

*Group 1: 18-19; Group 2: 20-24; Group 3: 25-34; Group 4: 35-44; Group 5:45-54; Group 6: 55-64; Group 7: 65 and over

Table 5.2 Comparison of the medians between Length of service group's perception for each factor based on Mann Whitney test.

Factor	Group Pairs*	Dependent Variable									
		Risk Perception	More than One Job	Age 35-44	Length 1-5 Years	Length >5 Years	Non-Injury	Local	4 Total**	7 Total**	Safety Knowledge
Length	1 versus 2		.091	.071					.045		.096
	1 versus 3	.002		.001	.017	.008	.06	.000	.001		
	1 versus 4	.044									.024
	2 versus 3	.012	.057		.011	.053	.037	.003			
	2 versus 4										
	3 versus 4	.033	.032	.046	.026	.047	.010	.000	.036	.005	

+P-value
P- value =0 - 0.01(Convincing evidence); P- value =0.011 - .05 (Moderate evidence); P- value =0.051 - .010 (Suggestive, but inconclusive evidence);

*Group 1: Less than 3 months; Group 2: 3 to 12 months; Group 3: 1 to 5 years; Group 4: More than 5 years
**4 Total and 7 Total: Hazard Identification score for hazard scenario 4 and 7

Table 5.3 Comparison of the medians between education group's perception for each factor based on Mann Whitney test.

Factor	Group Pairs*	Dependent Variable										
		Gender	Marital Status	Experienced injuries	Observed Injury	Exp. 3-11 Months	Not Married	No Dependent	Non-Injury	Local	7 Total**	Test
Education	3 versus 4					.029	.006	.004	.025	.025		.088
	3 versus 5	.016	.013	.000	.000		.019	.046	.023	.002	.001	.047
	4 versus 5	.099	.087	.000	.000	.047					.010	.002

+P-value
P- value =0 - 0.01(Convincing evidence); P- value =0.011 - .05 (Moderate evidence); P- value =0.051 - .010 (Suggestive, but inconclusive evidence);

*Group 1: No formal education; Elementary school; Group 3: High school; Group 4: Higher Education; Group 5:University;
**7 Total: Hazard Identification score for hazard scenario 7

Table 5.4 Comparison of the medians between Job Level' group's perception (part a)for each factor based on Mann Whitney test

Factor	Group Pairs*	Dependent Variable							
		Job Security	Age 45-54	Age 55-64	Level Supervisor	Married	No Injury	Did Not Observe Injury	Local
Job Level	1 versus 2	.007				.013	.035	.015	
	1 versus 3				.043				
	1 versus 4		.060	.020		.019	.032	.010	.080
	1 versus 5		.040	.035		.047			
	2 versus 3	.013					.072		.047
	2 versus 4	.042	.077	.016				.004	.058
	2 versus 5	.099	.037	.055					
	3 versus 4		.073				.052	.052	.006
	3 versus 5		.042						
	4 versus 5								.061

+P-value
P- value =0 - 0.01(Convincing evidence); P- value =0.011 - .05 (Moderate evidence); P- value =0.051 - .010 (Suggestive, but inconclusive evidence);

*Group 1: Apprentice; Group 2: Journeyman; Group 3: Forman/Lead; Group 4: Supervisor/Superintendent/Project Manager/Project Engineer; Group 5: Safety Professionals

Table 5.5 Comparison of the medians between Job Level' group's perception (part b)for each factor based on Mann Whitney test

Factor	Group Pairs*	Dependent Variable							
		1Total **	2 Total **	3 Total **	5 Total **	6 Total **	7 Total **	8 Total **	Test
Job Level	1 versus 2								
	1 versus 3								.075
	1 versus 4		.007	.001	.046	.010		.034	
	1 versus 5	.023	.032		.060				
	2 versus 3				.093				.070
	2 versus 4	.089	.019	.000	.002	.001	.032	.002	
	2 versus 5	.032	.037		.028	.093	.061		
	3 versus 4			.069			.059		
	3 versus 5	.042					.068		
	4 versus 5	.068							

+P-value
P- value =0 - 0.01(Convincing evidence); P- value =0.011 - .05 (Moderate evidence); P- value =0.051 - .010 (Suggestive, but inconclusive evidence);

*Group 1: Apprentice; Group 2: Journeyman; Group 3: Forman/Lead; Group 4: Supervisor/Superintendent/Project Manager/Project Engineer; Group 5: Safety Professionals
**# Total: Hazard Identification score for hazard scenario #

Based on the above-mentioned comparisons, there was no evidence that perception of various categories within each demographic factor differ for most of the 182 dependent variables. However, for 7 to 26 variables, depending on the demographic factor, there was evidence [including convincing (p-value 0-0.01), moderate (p-value 0.011-0.05), and suggestive (0.051-0.10) evidence] that the perception of worker groups within each factor were not similar. Job Security, Job Level, and Job Number showed the highest number of differences among categories (26, 21, and 19 variables, respectively).

The Mechanical and Electrical Risk measures and Hazard Identification of different groups of respondents within each demographic factor were compared by using the non-parametric Median Test. The non- parametric method was used because normality assumptions of the dependent variables were not met. Mood's median test verifies the null hypothesis that the medians of the populations from which two or more samples are drawn are the same. Mood's median test is more robust against outliers than the Kruskal-Wallis test (de Smith, 2015). Within most of the mechanical and electrical risk measures, one or two data points were extremely different than the rest. The summary of results is shown in Table 5.6. As an example, the data in the first row can be interpreted as there being moderate evidence (p-value = 0.031) that different age groups have different H total partial 4 score (MLHI score without the good practices' score). Evidence of differences among mechanical respondents was only found for Total Partial11 (Unit risk for scenario 11 with no near miss risk) in relation to Education and Total Partial 1 (Unit risk for scenario 11 with no near miss risk) relative to Observed Injury, Length of Service, and Marital Status. Evidence of differences among electrical respondents was only found for three variables, E Total Partial 2 (Risk of Scenario 2 for electrical trade –No Near Miss), E Total 2 (Risk of

Scenario 2 for electrical trade), and E Total 9 (Risk of Scenario 9 for electrical trade) within the Job Number factor. For hazard identification, some variables showed evidence of differences within all demographic variables except Observed Injury, Gender, and Job Number. No evidence of differences between males and females were observed for all risk and hazard variables. However, for the Average Hazard, the existence of differences within Age, Experience, Job Level, Job security, Local Traveler, and Union Status was noticed. This result indicates that hazard identification seems to have some relationship with some of the demographic factors, which should be considered for a thorough investigation. In the case of safety knowledge, the results reveal that employees with different education level and length of service have different safety knowledge test scores.

For the Test Score, evidence of a difference within demographic factors was only found for Education and Length of Service. It can be concluded that in general, demographic factors do not affect risk perception of employees. This result was in line with previous research conducted by Hallowell (2010) who found no significant correlation between demographic factors and risk perception.

Table 5.6 Comparison of risk and/or hazard between respondent groups of demographic factors

Demographic factor	Risk and /or Hazard Variable	Statistical Strength	Statistical Conclusion
Age	H Total Partial 4	P= 0.031	Moderate Evidence
	H Total 4	P= 0.018	Moderate Evidence
	H Total Partial 5	P= 0.003	Convincing Evidence
	H Total 5	P= 0.025	Moderate Evidence
	Hazard Average	P= 0.039	Moderate Evidence
Dependents	H Total Partial 6	0.007	Convincing Evidence
	H Total 6	0.024	Moderate Evidence
Education	M Total Partial 11	0.023	Moderate Evidence
	H Total Partial 7	0.004	Convincing Evidence
	H Total 7	0.006	Convincing Evidence
	Test Score	0.009	Convincing Evidence
Experience	H Total 1	0.004	Convincing Evidence
	H Total 4	0.013	Moderate Evidence
	H Total Partial 5	0.005	Convincing Evidence
	H Total 5	0.029	Moderate Evidence
	Hazard Average	0.019	Moderate Evidence
Had Injury	H Total Partial 6	0.026	Moderate Evidence
Observed Injury	M Total Partial 1	0.019	Moderate Evidence
Gender	All 62 Variables		No Evidence
Job Level	H Total 2	0.046	Moderate Evidence
	H Total Partial 3	0.004	Convincing Evidence
	H Total 3	0.000	Convincing Evidence
	H Total Partial 5	0.010	Convincing Evidence
	H Total 5	0.039	Moderate Evidence
	H Total Partial 6	0.004	Convincing Evidence
	H Total 6	0.004	Convincing Evidence
	H Total Partial 8	0.037	Moderate Evidence
	Hazard Average	0.014	Moderate Evidence
Job Number	E Total Partial 2	0.019	Moderate Evidence
	E Total 2	0.019	Moderate Evidence
	E Total 9	0.027	Moderate Evidence
Job Security	H Total 3	0.027	Moderate Evidence
	H Total 8	0.017	Moderate Evidence
	Hazard Average	0.030	Moderate Evidence
Length of Service	M Total Partial 1	0.003	Convincing Evidence
	H Total 2	0.025	Moderate Evidence
	H Total 3	0.044	Moderate Evidence
	H Total Partial 6	0.044	Moderate Evidence
	H Total Partial 7	0.026	Moderate Evidence
	H Total 7	0.031	Moderate Evidence

Table 5.6 (Continued)

Demographic factor	Risk and /or hazard variable	Statistical Strength	Statistical Conclusion
	Test Score	0.034	Moderate Evidence
Local versus traveler	H Total 5	0.049	Moderate Evidence
	Hazard Average	0.035	Moderate Evidence
Marital	M Total Partial 1	0.039	Moderate Evidence
	H Total 1	0.001	Convincing Evidence
	H Total Partial 5	0.015	Moderate Evidence
Union status	H Total 2	0.012	Moderate Evidence
	H Total Partial 3	0.005	Convincing Evidence
	H Total 3	0.000	Convincing Evidence
	H Total Partial 3	0.044	Moderate Evidence
	H Total Partial 6	0.011	Moderate Evidence
	H Total 6	0.028	Moderate Evidence
	Hazard Average	0.005	Convincing Evidence

The average hazard identification score (MLHI) for each hazard scenario obtained from the survey participants is presented in Table 5. 7. As shown in the table, employees have missed approximately 70 to 85 percent of the hazards and positive safety practices. This finding is supported by previous research, however prior researchers reported scores are 20 to 30 percent lower (Albert et al. 2014; Bahn 2013). This difference could be due to several factors. One factor could be the length of survey where survey respondents were in rush to finish the survey because of its length and did not put extensive thought into their review and assessment of the hazards and safety practices. Another reason would be the presentation method used for the survey.

Table 5.7 Average hazard identification score (MLHI)

Hazard Scenario #	Partial score*	Total score
1	0.306122	0.323615
2	0.252551	0.276644
3	0.22449	0.191523
4	0.137291	0.158892
5	0.247166	0.22449
6	0.271429	0.25
7	0.231293	0.194805
8	0.170686	0.164723

*In this column good practices are not included.

Furthermore, in order to determine whether there is any difference between the experts' and field employees' perception for personal demographic and mechanical and electrical risk variables, the Mann Whitney non-parametric test for two independent samples was carried out. No evidence of a difference was found between the experts' and non-experts' opinion for a majority of the 182 dependent variables under study (Appendix J3), except for 12 variables (Table 5.8). Table 5.8 presents the mean and mean rank of the expert panel's and field employees' opinions together with the p-values and statistical conclusions about the existence of any evidence between the two groups. For example, the first row indicates that there is suggestive evidence (p-value = 0.098) that these two groups rate the importance of risk perception differently. There was moderate evidence that

experts are different than field employees in terms of safety knowledge, hazard identification, age, unit risk of scenario 3 (mechanical) on near miss severity (M3A), and unit risk of scenario 6 (mechanical) on near miss severity (M6A). Suggestive evidence of a difference was also observed for risk perception, job security, labor union, non-union, unit risk of scenario 2 (mechanical) on hospitalized injury severity (M2C), unit risk of scenario 6 (mechanical) on non-hospitalized injury severity (M6B), and unit risk of scenario 10 (mechanical) on near miss severity (M10A). Although both the experts and field employees agreed on the effect of risk perception, safety knowledge, hazard identification, age, and job security, the mean rating from the experts was higher than that for field employees for risk perception, age, and job security, and lower for safety knowledge and hazard identification. Experts were neutral about the effect of the non-union factor on risk, but field employees somehow disagreed about this influence. In addition, the experts disagreed about the effect of labor union on risk, while field employees were in agreement on this effect. The ratings from experts for M2C, M3A, M6A, M6B, and M10A were higher than those from the filed employees.

Table 5.8 Comparison of Experts perception with Field Employees in terms of personal demographic and mechanical and electrical risk variables using Mann Whitney U Test

Expert Panel VS Field Employees	Mean		Mean Rank		Statistical Strength	Statistical Conclusion
Risk perception	Experts Non-Experts	4.43 4.16	Experts Field Employees	37.71 27.78	P= 0.098	Suggestive Evidence
Safety knowledge	Experts Non-Experts	3.57 4.32	Experts Field Employees	16.43 30.76	P= 0.016	Moderate Evidence
Hazard Identification	Experts Non-Experts	4.14 4.56	Experts Field Employees	18.50 30.47	P= 0.040	Moderate Evidence
Age	Experts Non-Experts	4.14 3.42	Experts Field Employees	38.36 26.49	P= 0.049	Moderate Evidence
Job security	Experts Non-Experts	4.14 3.36	Experts Field Employees	37.43 26.02	P= 0.057	Suggestive Evidence
Labor union	Experts Non-Experts	2.57 3.42	Experts Field Employees	17.86 29.48	P= 0.061	Suggestive Evidence
Non-union	Experts Non-Experts	3.00 2.50	Experts Field Employees	38.29 27.70	P= 0.087	Suggestive Evidence
M2C	Experts Non-Experts	4.71 3.24	Experts Field Employees	28.07 19.54	P= 0.081	Suggestive Evidence
M3A	Experts Non-Experts	8.14 7.15	Experts Field Employees	24.71 20.24	P= 0.030	Moderate Evidence
M6A	Experts Non-Experts	8.71 6.71	Experts Field Employees	30.36 19.07	P= 0.021	Moderate Evidence
M6B	Experts Non-Experts	7.00 5.41	Experts Field Employees	27.93 19.57	P= 0.089	Suggestive Evidence
M10A	Experts Non-Experts	7.71 5.91	Experts Field Employees	28.79 19.40	P= 0.057	Suggestive Evidence

The responses from the expert panel were also compared with those from the field employees in terms of unit risk for different mechanical and electrical trades, but no evidence of a difference was observed between the two groups of respondents (Appendix J4). A summary of results is shown in Table 5.9. As can be seen in Table 5.9, all of the p-values were above 0.10, suggesting the lack of any difference between these groups.

Table 5.9 Comparison of Experts with Field Employees in terms of unit risk for mechanical and electrical trades using Mann Whitney U Test

Experts VS Field Employees	Statistical Strength	Statistical Conclusion
All unit risk for mechanical trade	P> 0.10	No Evidence
All unit risk for electrical trade	P> 0.10	No Evidence

The relationship of hazard identification score and safety knowledge score was studied using Pearson's correlation. This parametric test was used because both variables had normal distribution. There was moderate evidence that a linear relationship existed between hazard identification scores and safety knowledge scores (Table 5.9). However, the relationship was not strong (r_p=0.35, r^2 =0.123) indicating that only 12.3% of the total variation of one variable is explained by another variable. This result validates the other research efforts to create means and methods to improve hazard

identification since training cannot solely improve hazard identification significantly (Albert et al. 2013; Albert et al. 2014).

The correlation coefficients of 44 risk variables with hazard identification scores and safety knowledge scores were also obtained. In this case Spearman's Rank Correlation test was used because the assumption of normality was not met for several risk variables. Contrary to the Pearson correlation, Spearman's Rank Correlation does not require any assumption about the shape of distributions (de Smith 2015). Except for a few risk variables which are presented in Table 5.9, no evidence for the relationship of risk variables with hazard identification scores and safety knowledge scores was observed because the p-values were greater than 0.10, suggesting a lack of linear correlation between the pairs of variables under study. Only mild negative correlations of E Total Partial 4 and E Total 4 with safety knowledge scores were suggested. The analysis shows convincing evidence that E Total Partial 2 (unit risk for scenario #2 in electrical section – near miss not included) and E Total 2 (unit risk for scenario #2 in electrical section) risk variables were negatively and highly correlated (-0.68 and -0.70, respectively) with hazard identification scores. The other three correlations were either low or moderate significance (Table 5.10). Although there was no general relationship

found between risk variables and hazard score, scenario 2 should be studied further with a larger sample size to substantiate the results.

Table 5.10 Linear correlation coefficients among risk variables, hazard identification scores, and safety knowledge scores

Spearman's Rank Correlation

	Hazard identification score			**Safety knowledge score**		
Risk Variable	Correlation Coefficient	Statistical Strength	Statistical Conclusion	Correlation Coefficient	Statistical Strength	Statistical Conclusion
M Total 10	0.32	P= 0.066	Suggestive Evidence			
E Total Partial1	-0.54	P= 0.045	Moderate Evidence			
E Total 1	-0.54	P= 0.045	Moderate Evidence			
E Total Partial 2	-0.68	P= 0.007	Convincing Evidence			
E Total 2	-0.70	P= 0.005	Convincing Evidence			
E Total Partial 4				-0.46	P= 0.097	Suggestive Evidence
E Total 4				-0.47	P= 0.089	Suggestive Evidence

Pearson Correlation

Variable	Average hazard score Correlation Coefficient	Statistical Strength	Statistical Conclusion
Safety knowledge score	0.35	P= 0.013	Moderate Evidence

Unit risks calculated from the survey (expert panel) were compared with those from OSHA for each scenario using the one Sample Wilcoxon Signed Rank test (Steel et al. 1997). This non-parametric test was used because the samples were small (n=7 for each scenario) and none of the samples had a normal distribution based on the Q-Q probability plot (Thode 2002). A one sample test was used since the median of each sample obtained from the survey was compared with a fixed value from OSHA for every scenario. A summary of the statistical comparisons is given in Table 5.11. Except for two cases, which had a p-value of greater than 0.10, there was either convincing or moderate evidence (mostly convincing) that the unit risks based on the survey are different from the unit risks obtained from OSHA. However, Spearman's Rank Correlation showed a moderate relationship (r_s= 0.46, p-value 0.033) between the rank orders of unit risks calculated from the survey and unit risks from OSHA (Table 5.12). The author concludes that although the risk quantities are not the same, the survey participant's (experts and field employees combined) risk perception ratio between the scenarios are somewhat similar to risks obtained from the OSHA data.

Table 5.11 Comparison of the unit risks calculated from survey (expert panel) with the risks reported by OSHA using One Sample Wilcoxon Signed Rank Test

Unit risk by survey versus unit risk by OSHA		Results	
Survey	**OSHA**	**Statistical Strength**	**Statistical Conclusion**
Risk scenarios for mechanical trade			
Total Partial 1	Scenario 1	P<0.001	Convincing Evidence
Total 1 B	Scenario 1	P= 0.039	Moderate Evidence
Total Partial 2	Scenario 2	P<0.001	Convincing Evidence
Total 2 B	Scenario 2	P= 0.009	Convincing Evidence
Total Partial 3	Scenario 3	P<0.001	Convincing Evidence
Total 3 B	Scenario 3	P<0.001	Convincing Evidence
Total Partial 4	Scenario 4	P<0.001	Convincing Evidence
Total 4 B	Scenario 4	P<0.001	Convincing Evidence
Total Partial 5	Scenario 5	P<0.001	Convincing Evidence
Total 5 B	Scenario 5	P<0.001	Convincing Evidence
Total Partial 6	Scenario 6	P<0.001	Convincing Evidence
Total 6 B	Scenario 6	P<0.001	Convincing Evidence
Total Partial 7	Scenario 7	P<0.001	Convincing Evidence
Total 7 B	Scenario 7	P<0.001	Convincing Evidence
Total Partial 8	Scenario 8	P<0.001	Convincing Evidence
Total 8 B	Scenario 8	P<0.001	Convincing Evidence
Total Partial 9	Scenario 9	P<0.001	Convincing Evidence
Total 9 B	Scenario 9	P<0.001	Convincing Evidence
Total Partial 10	Scenario 10	P<0.001	Convincing Evidence
Total 10 B	Scenario 10	P<0.001	Convincing Evidence
Total Partial 11	Scenario 11	P<0.001	Convincing Evidence
Total 11 B	Scenario 11	P<0.001	Convincing Evidence
Risk Scenarios for electrical trade			
Total Partial 1	Scenario 1	P= 0.001	Convincing Evidence
Total 1 B	Scenario 1	P= 0.008	Convincing Evidence
Total Partial 2	Scenario 2	P= 0.001	Convincing Evidence
Total 2 B	Scenario 2	P= 0.013	Moderate Evidence
Total Partial 3	Scenario 3	P= 0.001	Convincing Evidence
Total 3 B	Scenario 3	P= 0.026	Moderate Evidence
Total Partial 4	Scenario 4	P= 0.001	Convincing Evidence
Total 4 B	Scenario 4	P= 0.048	Moderate Evidence
Total Partial 5	Scenario 5	P= 0.001	Convincing Evidence
Total 5 B	Scenario 5	P= 0.395	No Evidence
Total Partial 6	Scenario 6	P= 0.001	Convincing Evidence
Total 6 B	Scenario 6	P= 0.001	Convincing Evidence
Total Partial 7	Scenario 7	P= 0.001	Convincing Evidence
Total 7 B	Scenario 7	P= 0.002	Convincing Evidence

Table 5.11 (Continued)

Unit risk by survey versus unit risk by OSHA			Results
Total Partial 8	Scenario 8	P= 0.001	Convincing Evidence
Total 8 B	Scenario 8	P= 0.108	No Evidence
Total Partial 9	Scenario 9	P= 0.001	Convincing Evidence
Total 9 B	Scenario 9	P= 0.004	Convincing Evidence
Total Partial 10	Scenario 10	P= 0.001	Convincing Evidence
Total 10 B	Scenario 10	P= 0.001	Convincing Evidence
Total Partial 11	Scenario 11	P= 0.001	Convincing Evidence
Total 11 B	Scenario 11	P= 0.047	Moderate Evidence

Table 5.12 Spearman's Rank Correlation between the rank orders of unit risks from the survey and unit risks from OSHA

Variable	Statistical results		
Correlation of Unit risks from survey with Unit rRisks from OSHA	Correlation Coefficient	Statistical Strength	Statistical Conclusion
Total B	0.46	P=0.033	Moderate Evidence
Total Partial	0.46	P=0.033	Moderate Evidence

5.2 Safety Assessment Tool

5.2.1 Development Process

In this section a framework for the tool is described and the factor weights calculated based on the survey. Next, applications of the tool and framework are discussed.

As shown in the Figure 5.9 in order to complete the model to calculate the assessment score, five steps are required. The test score is based on the four main sections of the survey:

- Influence of personal factors on safety performance of a field employee (αX)
- Influence of risk perception on safety performance of a field employee (βY)
- Influence of hazard identification skills on safety performance of a field employee (γZ)
- Influence of safety knowledge on safety performance of a field employee (θT)

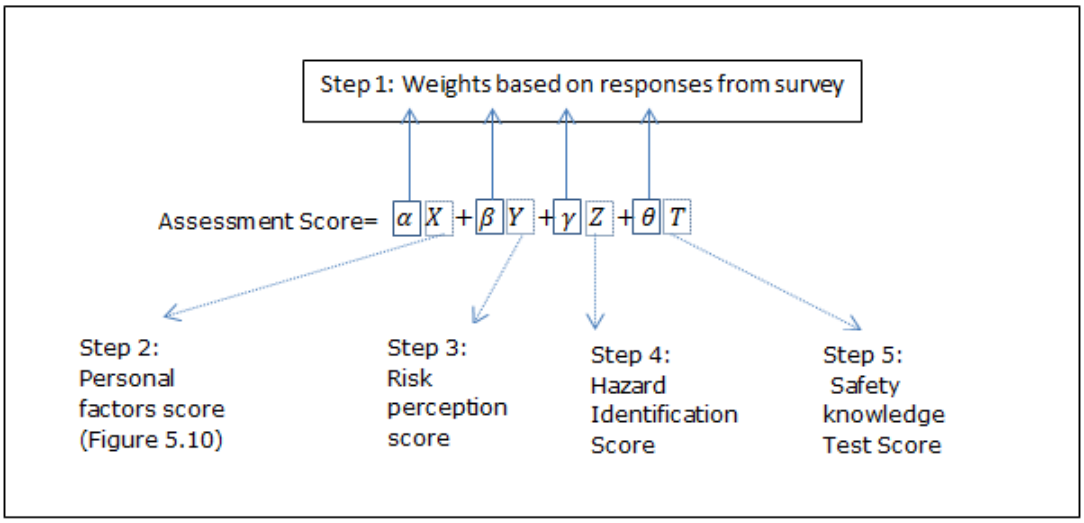

Figure 5.9 Model structure and steps

- Step 1: In order to calculate the weight factors for the model a survey question was used. In the survey the employees were asked to give their opinion using a Likert scale of the impact of the four main categories on safety (Survey section 1 part a). Table 5.13 shows the obtained results and the calculation of the weights.

Table 5.13 Average rating of the factors and their weight

	Personal factors α	**Risk Perception** β	**Safety Knowledge** γ	**Hazard Identification** θ	**Total**
Average value from survey (Likert scale)	3.8	4.2	4.2	4.5	16.8
Weight (percent of Likert scale value relative to the sum of the Likert scale values for all four categories)	22.91%	25.00%	25.21%	26.88%	100%

- Step 2: To calculate the personal factor score (X) value two values are needed (Xbi, Xci). Equation 5.1 shows the calculation of X.

$$X = \sum_i Xbi * Xci \qquad (5.1)$$

where "i" refers to the different demographic factors.

Xbi is the weight of each sub-demographic factor (e.g. age, gender, etc.) inside the personal factors. These weights were obtained from the survey (Likert scale). Weights are calculated by dividing each sub category's average scale by the total value of all scales. Table 5.13 shows the calculated weights.

Table 5.14 Average weight of the demographical factors and the calculated weight

	Age	**Gender**	**Marital status**	**Dependents**	**Work experience**	**Education**	**Length of service**	**More than one job**	**Experienced injuries**	**Observed injuries**	**Formal training**	**Job security**	**Local traveler**	**Labor union**	**Job level**	**Total**
i	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total
Response Average	3.51	2.47	2.84	3.36	4.20	3.27	3.25	3.00	3.27	3.53	3.58	3.46	2.78	3.31	3.60	41.35
Weight	8.49%	0	0	8.13%	10.16%	7.91%	7.87%	7.25%	7.91%	8.53%	8.66%	8.37%	0	8.00%	8.71%	100%

The sub-factors that are zero in Table 5.13 are due to having a Likert scale value of less than three, which indicates that those factors do not impact the safety performance.

Xci is the value of each sub-category from the Xbi section. For instance, XcAge is the sub-age category's impact value on XbAge. In the survey, employees were asked to rate each of the categories, then the rates were converted to a Likert scale. Xci, depending on the category, could have more than one sub-categories (e.g., age has six sub-categories ranging from 18-19 to +65), however only one of the categories is applied to the employee for assessment. Thus, the

maximum Likert rating in each category is considered to have 100% of the weight. For example in the sub-categories of the age group, category 45-54 has the highest Likert value (3.98) and it is considered as the baseline for other age categories. Weights in each sub-category are calculated by dividing the Likert value of that sub-category by the maximum Likert value of the category. In the age example, if the employee is in the 25-34 age sub-category (Likert value of 3.42), then Xci is calculated as 2.63 divided by 3.98 resulting in the weight of 86%. Furthermore, if the Likert value is below three, the weight will be set to zero. There are no negative points in this framework and since the overall score (assessment score) is out of one (100%), it is assumed that categories below three will not have any advantage toward safety performance.

Figure 5.10 shows the calculated values for each of the sub categories of personal factors.

Age (years)	18-19	20-24	25-34	35-44	45-54	55-64	65 and over
Score	1.96	2.63	3.42	3.88	3.98	3.56	3.23
Weight	0	0	85.90%	97.36%	100.00%	89.43%	81.06%

Length of service with the company	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Score	2.46	3.04	3.70	3.89
Weight	0	77.93%	95.05%	100.00%

Experience in the trade	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Score	1.95	2.32	3.53	4.05
Weight	0	0	87%	0

Education Level	No Formal Education	Elementary School	High School	Higher Education	University
Score	2.14	2.40	3.05	3.49	3.46
Weight	0	0	87.44%	100.00%	98.99%

Job Level	Apprentice	Journeyman	Foreman/Lead	Supervisors/Superintendent/PM
Score	2.65	3.63	4.07	4.35
Weight	0	83.47%	93.55%	100.00%

Dependents	No dependents	Has at least one dependent
Score	2.93	3.82
Weight	0	100%

Employee has had an injury that required more than first aid treatment	Yes	No
Score	3.81	3.12
Weight	100%	82.03%

Employee has observed an injury that required more than first aid treatment	Yes	No
Score	3.86	2.89
Weight	100%	0

Job security perception	Employee feels his/her job is secure	Employee feels that his/her job is not secure
Score	3.53	3.04
Weight	100%	86.06%

Figure 5.10 Calculated weight values for each of the sub-categories

The risk perception score (Y) value in the assessment equation (5.2) is calculated by the following equation (5.2):

$$Y = \frac{\sum_j (1 - \frac{|URe_j - URm_j|}{URm_j})}{j} \qquad (5.2)$$

In Equation 5.2, j is the number of risk scenarios; URe_j is the unit risk based on the employee's response for Scenario j; URm_j is the unit risk based on the median of responses from the survey for Scenario j.

The median of the unit risks was used because, as seen previously in this section, the medians of the responses were correlated with unit risks obtained from the OSHA data, thus making them a valid comparison point.

Hazard identification score (Z) and safety knowledge score (T) values are obtained based on the employee's response to the hazard identification and safety knowledge questions. Z is basically the MLHI value explained in the previous section (total number of hazards, bad safety practices, and good safety practices identified by the employee divided by total number of hazards, bad practices, and good practices identified by the expert panel). T is the percentage of right answers in the test.

5.2.2 Application

A mechanical and electrical construction company can use this tool to evaluate the potential safety performance of field employees and identify problem areas before employees get injured. Moreover, the tool can be used to benchmark the employees based on the framework values and obtain the correlation of these value with the company's actual incident rates. Currently there are no tools available to track these factors in individuals. It would be of interest to see the effect of involvement in an accident.

5.2.3 Example of implementation

Suppose an employee has been hired with following attributes:

- Age: 20-24
- New hire, no other job
- 1 and a half years of experience in the trade
- High school education
- Apprentice
- No dependents
- Has never had a severe injury or observed one
- He think he has job security (this is an ongoing long term project)
- He has had OSHA 10 Hour Construction training
- His safety knowledge test score is 85%
- Hazard identification score: 30%

Figure 5.11 shows the categories selected for the example employee based on the information provided.

Age (years)	18-19	20-24	25-34	35-44	45-54	55-64	65 and over
Score	1.96	2.63	3.42	3.88	3.98	3.56	3.23
Weight	0	0	85.90%	97.36%	100.00%	89.43%	81.06%

Length of service with the company	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Score	2.46	3.04	3.70	3.89
Weight	0	77.93%	95.05%	100.00%

Experience in the trade	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Score	1.95	2.32	3.53	4.05
Weight	0	0	87%	0

Education Level	No Formal Education	Elementary School	High School	Higher Education	University
Score	2.14	2.40	3.05	3.49	3.46
Weight	0	0	87.44%	100.00%	98.99%

Job Level	Apprentice	Journeyman	Foreman/Lead	Supervisors/Superintendent/PM
Score	2.65	3.63	4.07	4.35
Weight	0	83.47%	93.55%	100.00%

Dependents	No dependents	Has at least one dependent
Score	2.93	3.82
Weight	0	100%

Employee has had an injury that required more than first aid treatment	Yes	No
Score	3.81	3.12
Weight	100%	82.03%

Employee has observed an injury that required more than first aid treatment	Yes	No
Score	3.86	2.89
Weight	100%	0

Job security perception	Employee feels his/her job is secure	Employee feels that his/her job is not secure
Score	3.53	3.04
Weight	100%	86.06%

Figure 5.11 Selected categories for the example employee

Table 5.15 shows the calculated values for Xbi, Xci, and X based on the example employee information and survey.

Table 5.15 Calculated values for Xbi, Xci, and X based on the example employee

	i	Weight (Xbi)	Categories (Xci)	X=Xbi*Xci
Age	1	8.49%	0	
Gender	2	0	-	
Marital status	3	0	-	
Dependents	4	8.13%	0	
Work experience	5	10.16%	87%	8.84%
Education	6	7.91%	87.44%	6.92%
Length of service	7	7.87%	0	
More than One job	8	7.25%	100%	7.25%
Experienced injuries	9	7.91%	82.03%	6.49%
Observed injuries	10	8.53%	0	
Formal training	11	8.66%	100%	8.66%
Job security	12	8.37%	-	
Local traveler	13	0	-	
Labor union	14	8.00%	-	
Job level	15	8.71%	-	
Total	Total	100%		38.16%

For the Risk perception score (Y) the employee has ranked each scenario as shown in Table 5.16:

Table 5.16 Calculation of risk perception score (Y) for the example employee

	1	2	3	4	5	6	7	8	9	10	11	Average
Example (Unit risk)	0.17	0.06	0.35	0.51	13.73	0.72	5.28	11.93	0.63	6.42	2.59	
Survey median (Unit risk)	0.29	0.26	1.33	0.26	1.24	0.27	1.23	0.17	1.22	0.31	1.07	
Score (Y)	60%	25%	26%	4%	0%*	0%*	0%*	0%*	51%	0%*	0%*	15%

* When the difference with median is more than 100%, a zero percent is assigned to that scenario's risk score

The calculation of overall score based on the previous findings is shown in Table 5.17.

Table 5.17 Calculation of assessment score for the example employee

	Personal Factors	**Risk Perception**	**Safety Knowledge**	**Hazard Identification**	**Total**
Weight (percent of Likert scale value to sum of the Likert scale values for all four categories) $\alpha, \beta, \gamma, \theta$	22.91%	25.00%	25.21%	26.88%	100%
Example (X,Y,Z,T)	38.16%	15%	85%	30%	
Total= Xα,Yβ,Zγ,Tθ	8.74%	3.75%	21.41%	8.06%	**41.96%**

The core for the given example was calculated as 41.96%. This shows that the person could get only 41.96% of the possible score. However, whether this score in general means they are safe or not needs further investigation. This score could be used to show that the employee has a problem in risk perception (15%) and in hazard identification (30%), and the employer should focus on improving these two aspects.

6 Conclusion

The primary objective of this study was to create a tool for contractors to benchmark the potential safety performance of their employees in the mechanical and electrical trades. Currently there is no comprehensive and multi-dimensional tool available for construction companies to assess and benchmark potential safety performance of employees.

In order to develop this assessment tool, internal and individual related factors influencing the safety performance of the workers needed to be identified. Using construction and occupational safety literature, a list of personal and individual related factors was created. The four main categories of factors were personal demographic factors, risk perception, hazard identification, and safety knowledge. Each of these categories was incorporated into a survey questionnaire to capture input from field employees. This research focused on mechanical and electrical trades and field employees in these trades including apprentices, journeymen, foremen, leads, superintendents, project managers, project engineers, and safety professionals. Since the research focused on individual workers, field personnel were selected as participants for the survey as their input and perception were required to build and benchmark the model for the tool. The

participants were asked to give their perception about the impact of factors on safety performance, rate frequency of injuries for different severity categories associated with risk scenarios, identify hazards in various hazard scenarios, and answer safety knowledge questions.

Survey responses were collected and processed. Additional analysis was required to obtain the risk units for the risk scenarios and hazard identification score based on the responses. Moreover, the risks associated with work operations in scenarios based on OSHA records were quantified. Further analysis was conducted on these factors and sub-factors to statistically compare different demographics groups for each of the factors and correlation of perceived risks with risks obtained based on OSHA records. This study showed a moderate relationship (rs= 0.46) between the rank orders of unit risks calculated from the survey and unit risks from OSHA.

Ultimately a model was suggested based on the obtained data and analysis. The suggested model can be used by mechanical and electrical contractors to improve construction safety. When a new employee is hired, a small amount of information is available about the employee. This tool could be used as a starting benchmark to identify which areas of safety need to be focused on for each employee. For instance, if the employee scores low in the hazard identification

section, the employer could focus on training the employee in recognizing hazards or having their supervisors prepare more detailed pre-task plans for those individuals.

Ultimately a contractor can use the suggested framework to build the customized model after capturing the discussed data in this framework. This information would provide contractors with more accurate weighting of factors to identify problem areas for better planning.

In conclusion, the following summarizes the conclusions relative to each research question:

- A literature review was conducted to identify any available comprehensive tool for assessing the safety performance of the employees. The literature concluded that there were no comprehensive tools available. (Research question 1)
- The literature review and an interview of the expert panel were conducted to identify the factors that impact the safety of the employees without considering outside factors. A list of factors was created. Similarly, this process was conducted for the personal demographic factors as well and the list of sub factors that impact safety was created. (Research questions 2,3)

- A literature review was conducted and identified methods that could objectively assess risk perception. Also a method to test the employee's ability to identify hazards was incorporated. Furthermore, in order to compare the result with an objective source, OSHA incidents were analyzed. (Research questions 4,5)
- A statistical analysis and comparison of data was conducted to answer research questions 6, 7, and 8.
- Finally a framework was proposed based on the obtained data to assess the safety performance of field employees to satisfy the main objective of this research.

6.1 Limitations

The research limitations of this study are as follows:

- The weighting of the factors is based on the perception of the field employees and not correlated to the incident rates. Thus, it could create a bias based on demographics of the respondents.
- OSHA incident records are accurate for severe injuries (hospitalized injuries and fatalities). Thus, the numbers for non-hospitalized injuries are not reflective of the range of actual injury occurrences. Moreover, OSHA records do not cover near

misses, and therefore near misses are not represented well in the framework.

- A process to calculated unit risks for risk scenarios included associating each risk scenario with the injury causes which was based on the expert panel's input. This could bring some subjectivity for this process even though the data are objective. This could potentially impact he comparison of data with OSHA based records.
- The survey questionnaire required at least half an hour to complete. Thus, in the section where a descriptive input was required (hazard identification section), participants might have not spent enough time to finish the section in detail.
- Employees were given a week to complete the survey. Even though the survey was confidential, employees might have been uncomfortable in getting low scores in safety knowledge; thus they could have used aid to answer the questions.
- Survey samples in this study were convenience samples. Thus, the scope of this research may not be statistically extended to a greater population.
- This study has only focused on mechanical and electrical construction trades in the United States. Thus, the perceptions

are limited to specific trades and do not represent construction industry as a whole. Different trades have different qualification and training requirements. Hence, the tool could produce different results for trades other than mechanical and electrical, e.g., carpentry.

- The expert panel consisted of only seven members. These seven members were mostly safety focused and also have worked only Pacific Northwest so their perceptions are influenced by the construction environment in the region and not necessarily all of the United States.
- Demographics information of the participants indicates that not all of the groups were surveyed. For instance, non-union field employees are not represented in this research. Lack of having representatives from majority of demographical groups would create a bias. As an example, in this research it was found that non-union people had lower rating
- The risk and hazard scenarios were presented in a non-interactive method (description and pictures) to the workers. Thus the participants might not understand the situations in the scenarios completely.

- Legal and ethical issues could arise when implementing the tool. These issues could occur when an employee scores a low rating from the tool and the employer assigns them to a risky job without any further actions. However, it could be argued that if the employer takes proper action to improve the score of the employee, and re-evaluates the employee, the legal and ethical issues could be mitigated.

6.2 Recommendations

Information regarding the employee's potential safety performance should ideally be available to the company before an incident happens. This research suggests a preliminary framework to address the issue. It provides the company a benchmarking tool to assess an employee's potential safety performance on a project. However, this framework can be extended and enhanced upon. The framework can be used as a foundation for companies and researchers to further investigate the risk perception, safety knowledge, hazard identification, and personal demographical factors. This study incorporated methods, scales, and ideas from previous research. It is recommended future research be consistent with the assumptions made in the study when capturing information for each section.

6.2.1 Broader representation of the employee demographics

As it was shown in section four of the thesis, the survey participants were not distributed across all of the demographic categories. For example, the survey captured input from union employees only. Thus, it is recommended that the developed survey be conducted for other projects and settings in order to obtain a broader perspective of worker perceptions.

6.2.2 Validation of research

A crucial additional research study is to validate the results with secondary data. This step is an important part of developing the model for commercial purposes and confirming the accuracy of the developed tool. In the current research, in order to validate the results, different methods were used in each section. For the personal demographic factors, the effects of the factors were compared with the findings of previous studies. In the risk perception section, the risk values were compared with the calculated risks based on OSHA incident records. These incidents were reviewed and injury causes were associated with each scenario by the expert panel. The first issue in this process is that the number of OSHA incident records that are low severity cases were

extremely low. The limitation that the OSHA records are limited to high severity incidents was mentioned by Hallowell (2010). The second issue is the assignment of injury causes to each scenario by the expert panel can add some degree of subjectivity to it. Furthermore, the effect of the hazard identification score and safety knowledge is based on the worker perceptions and was only validated with previous research. Author recommends that this tool would be used in some large scale projects in order to gather the actual injury data.

The author recommends implementing the tool in a company as a preliminary benchmarking tool. This implementation would be followed by capturing the actual injury rates and associate the rates with the factors, risk perceptions, hazard identification skills, and safety knowledge. Also, it is worthwhile conducting a study to find the weighting factors of each injury cause associated with each risk scenario.

6.2.3 Presentation of scenarios

In the current research, written descriptions of scenarios and pictures of scenarios were used to capture the risk perception of the workers and their hazard identification abilities, respectively. However, these methods are not the most accurate means of capturing such data.

Although the scenarios were written with the expert panel's input, and went through several revisions to create non-suggestive scenarios, this process could not be achieved for all scenarios as some of the situations had to be described, e.g. hot weather, or inadequate fall protection. Also readers might have interpreted the scenarios differently based on how they read it. In the case of the picture scenarios to assess the hazard identification abilities, the pictures lack the ability to capture the overall situation. For instance, a ladder near an opening might just be stored and not used but the picture indicates it as an improper ladder setup. Consequently the author recommends incorporating other innovative methods such as virtual reality or game technologies so the employees and survey participants can grasp the holistic situation in each specific scenario.

6.2.4 Weighted scoring for hazard identification

In this research, when calculating the MLHI, all identified hazards, good safety practices, and bad safety practices were given the same value regardless of the severity of the consequences. It is recommended by the author that in future research, identified hazards, bad safety practices, and good safety practices should be weighted based on their severity. For instance, failing to identify a fall

hazard could have much more dire consequence than failing to identify a housekeeping issue.

6.2.5 A framework for other trades in construction

This research focused only on the mechanical and electrical trades in construction. This focus enabled creating more specific risk scenarios and increasing accuracy in assessing the situation. However, the author suggests conducting a study on other construction trades, e.g., concrete and formwork, with similar assumption so that different trades can be compared for further improvement of the model.

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Appendix

Appendix A: ConstructSecure example

CS safety assessment example adopted from ConstructSevure (2013b)

ABC COMPANY INFORMATION
Address: 225 Cedar Hill Street **City:** Marlborough **State:** MA **Zip Code:** 01752 **Telephone #:** 508-630-2220 **Main Fax #:** **Primary Contact:** David Millinazzo **Main Email Address:** davem@constructsecure.com **Date of Enrollment:** 9/10/2009 **Date of Last Update:** 10/5/2012 **Renewal Date:** 9/10/2013

TRADE CATEGORY	SCORE
All Other Specialty Trade Contractors	78.42 / 100
Lagging indicators composit score	45 / 45
Leading indicators composit score	33.42 / 55

COMPANIES ABLE TO VIEW YOUR PROFILE
• Harvard University • Consigli • Dansure Inc • Gilbane • Intel Corporation • Kenny Construction • MIT • NIH • Pepsico • Skanska • Suffolk Construction • The Graham Company • Turner • WS Aiken Add / Remove

STRENGTHS
DART is better than industry average Recordable Cases is better than industry EMR is better than the industry average No fatalities in the past Safety Management Systems Safety Program Elements Special Elements

WEAKNESSES
Points deducted from Safety Documentation Contractor was cited for violations in the past

Appendix B: SafetyInfo survey

Employee safety evaluation questionnaire adopted from SafetyInfo (2013)

Safety Survey

Please answer all questions. If you answer any questions with a "No", please ask you supervisor to help you learn the answers that can prevent injury to you and others. We care about your safety!

Name _____ Department _____ Date _____

Yes	Does not apply	20 Questions	No
		Have you been trained to use the Personal Protective Equipment (PPE), such as safety glasses, respirators, hard hats, gloves, you use on your job?	
		Do you know where all the emergency exits are?	
		In an emergency, do you know where to go after evacuating the building?	
		Do you know where to shelter at work during emergency weather conditions	
		Do you know what to do if you see exposed electrical wires?	
		Do you know what to do if you have a broken tool?	
		Do you know what to do if a piece of equipment jams?	
		Do you read the label on containers before using any chemical?	
		Do you know who to ask if you need more information about a chemical you use?	
		Have you been trained in proper lifting techniques?	
		Do you encourage others to work safely?	
		Do you always use safety glasses when using hand tools?	
		Do you inspect all tools before use?	
		Do you know how to report a fire?	
		Do you report unsafe acts and unsafe conditions?	
		Do you know that 85% of all accidents are caused by Unsafe Acts by employees?	
		Do you know that "shortcuts" are unsafe acts?	
		Do you obey all Warning & Danger signs and tags?	
		Do you know not to attempt to repair or un-jam equipment unless you are specifically trained and authorized?	
		Do you know who to ask if you have any safety related questions?	

Appendix C: KPI audit

Score Key	≤ 69	70 to 89	≥ 90

Calculation Details

How is each metric score calculated?

- There is a total of 5 metrics, each worth a maximum of 20pts.

What is the criterion for each metric?

1. **Site Specific Safety Plan:**
   - PM/CMs are to ensure a [redacted] SSSP prior to commencement of work. 20 pts. for hardcopy onsite and accessible for review. 0 pts. for lack thereof.
2. **Subcontractors' SSSP/JHAs:**
   - PM/CMs are to ensure all subcontractors to [redacted] submit a SSSP prior to commencement of work. Begin at default value of 20 pts. Minus 5 pts. per each missing subcontractor SSSP. If no subs, default to max score of 20 pts.
3. **Job Site Orientations:**
   - PM/CMs are to ensure all employees and subcontractor employees "new to the site" participate in a Job Site Orientation. Begin at default value of 20 pts. 2 pts. deducted per each missing subcontractor employee / [redacted] employee.
4. **Weekly Safety Inspections:**
   - PM/CMs are to ensure a Weekly Job Site Safety Inspection at the beginning of the project and weekly thereafter. 20 pts. for documented inspection week of, or week prior to consultation; 20 pts. deducted for missed. Additional 5 pts. for each week unaccounted for. Note: Gaps between Weekly Safety Inspections due to no construction activity should have an inspection form indicating such.
5. **Weekly Safety Meetings:**
   - PM/CMs are to ensure a Weekly Safety Meeting at the beginning of the project and weekly thereafter. 20 pts. for documented meeting week of, or week prior to consultation; 20 pts. deducted for missed. Additional 5 pts. for each week unaccounted for. Note: Gaps between Weekly Safety Meetings due to no construction activity should have a sign-in roster indicating such.

How is a KPI Audit score calculated?

- Total of the 5 metrics. Maximum score possible = 100

How are Performance Rollup scores determined?

- Running total is derived by sum of all audit scores divided by number of projects visits. Maximum score possible = 100

Appendix D: Java code

```
import org.jsoup.Jsoup;

import org.jsoup.nodes.Document;

import org.jsoup.nodes.Element;

import org.jsoup.select.Elements;


import java.io.*;

import java.util.*;



public class ReadURL {


    public static List<String> generateLinks(int fileNumber) throws IOException {

        List<String> links = new ArrayList<String>();

        BufferedReader br = new BufferedReader(new FileReader(fileNumber+".txt"));

        String currUrl = "";

        String baseLink; String[] splited;

        while((currUrl = br.readLine()) != null){

            splited = currUrl.split("\\?id=");

            baseLink = splited[0] + "?id=";

            splited = splited[1].split("&id=");

            for(String s:splited){

                links.add(baseLink + s);

            }

        }

        return links;

    }

    public static void main(String[] args) throws IOException {
```

```
int fileNumber = 1731;
List<String> links = generateLinks(fileNumber);
//BufferedReader br = new BufferedReader(new FileReader(fileNumber+".txt"));
int numOff = 0;
/*String s32; StringTokenizer st2; int numid = 0;
while((s32 = br.readLine()) != null){
    String[] ss = s32.split("id=");
    numid += ss.length - 1;
}
System.out.println(numid);*/
int numid = 0, numOrId =0;
int test1 = 0, test2 = 0, test3 = 0, test4 = 0;
boolean end = false;
Map<String, Integer> uniqueFatCauses = new HashMap<String, Integer>();
//Map<MatchCauseDegree, Integer> fatDeg = new HashMap<MatchCauseDegree, Integer>();
Set<String> allFatCauses = new HashSet<String>();
Map<String, Integer> fatDeg1 = new HashMap<String, Integer>();
Map<String, Integer> fatDeg2 = new HashMap<String, Integer>();
Map<String, Integer> fatDeg3 = new HashMap<String, Integer>();
Map<String, Integer> fatDeg4 = new HashMap<String, Integer>();
PrintWriter pw = new PrintWriter(new FileWriter("output_notSpec&Other_"+fileNumber+".txt"));
ArrayList<String> natrueList = new ArrayList<String>();
ArrayList<String> causeList = new ArrayList<String>();
ArrayList<String> fatCauseList = new ArrayList<String>();
ArrayList<String> List1 = new ArrayList<String>();
ArrayList<String> List2 = new ArrayList<String>();
//while((currUrl = br.readLine()) != null){
BufferedWriter bw;
for(String currUrl : links){
```

```
        boolean id = false, inspection = false, age = false, sex = false, degree = false, nature = false,
occupation = false, construction = false;

        double idVal = -1, ageVal = -1;

        String accNum = "", inspecVal = "";

        String degVal = "", natureVal = "", ocpVal = "", causeVal = "", fatCauseVal = "", titleVal = "",
eventDateVal = "", endUseVal = "", projTypeVal = "";

        //currUrl =
"https://www.osha.gov/pls/imis/accidentsearch.accident_detail?id=202023818&id=200359214&id=20136
3652&id=200375483&id=201614732&id=200359081&id=201495157&id=200375442&id=200776458&id=
200375467&id=200542082&id=200542074&id=170627236&id=202528378&id=200604718&id=2024772
12&id=200533990&id=201381340&id=201023348&id=200651784";

        Document doc = Jsoup.connect(currUrl).timeout(60000).get();

        bw = new BufferedWriter(new FileWriter("links" +fileNumber + "\\" + currUrl.split("\\?id=")[1] +
".html"));

        bw.write(doc.html());

        bw.flush();

        bw.close();

        Elements body = doc.select("table");

        int counter = 0;

        String[] lines = doc.html().split("\\n");

        boolean start1 = false, start2 = false, start3 = false;

        int index = 0, countSIC = 0;

        ArrayList<String> rowNum = new ArrayList<String>();

        String line;

        StringTokenizer st;

        String inspecTmpVal = "";

        while(index < lines.length){

            line = lines[index++];

            if(line.contains("blueBoldTen")){

                if(line.contains("Accident:")){

                    start1 = true;

                    if(line.contains("Event Date")){

                        List1.add(accNum);
```

```
            eventDateVal = line.split("Event Date: ")[1].split("<")[0];
        }
        else{
            String res = line.split(">Accident: ")[1];
            st = new StringTokenizer(res, "-");
            accNum = st.nextToken().split(" ")[0];
            titleVal = st.nextToken().split("<")[0];
            if(st.hasMoreTokens()){
                String s = st.nextToken().split("<")[0];
                if(!s.contains("br")){
                    titleVal += s;
                }
            }
            if(titleVal.contains(";")){
                String s = titleVal;
                String[] spl = s.split(";");
                titleVal = spl[0];
                for(int is = 1; is < spl.length; is++)
                    titleVal += "," + spl[is];
            }
        }
    }else if(line.contains("SIC")){
        countSIC++;
        while(!line.contains("blueTen"))
            line = lines[index++];
        st = new StringTokenizer(line.split("inspection_detail\\?id=")[1], "><");
        st.nextToken();
        inspecTmpVal = st.nextToken();
        line = lines[index++];
```

```
    line = lines[index++];
    st = new StringTokenizer(line.split("sic_manual")[1], "><");
    st.nextToken();
    int tmp = Integer.valueOf(st.nextToken());
    if(tmp == fileNumber){
        numOrId++;
        rowNum.add(inspecTmpVal);
        //map1.put(accNum, countSIC);
    }
}else if(start1 && line.contains("Keywords:")){
    List2.add(accNum);
    start2 = true;
    test3++;
}
else if(start1 && line.contains("End Use")){
    start2 = true;
    while(!line.contains("blueTen"))
        line = lines[index++];
    st = new StringTokenizer(line, "><");
    st.nextToken();
    st.nextToken();
    endUseVal = st.nextToken();
    line = lines[index++];
    st = new StringTokenizer(line, "><");
    st.nextToken();
    st.nextToken();
    projTypeVal = st.nextToken();
}else if(start1 && start2 && line.contains("Inspection")){
    while(!line.contains("<tr>")){
```

```
if(line.contains("Inspection")){
    id = true;
    inspection = true;
    counter+=2;
}
if(line.contains("Age")){
    age = true;
    counter++;
}
if(line.contains("Sex")){
    sex = true;
    counter++;
}
if(line.contains("Degree")){
    degree = true;
    counter++;
}
if(line.contains("Nature")){
    nature = true;
    counter++;
}
if(line.contains("Occupation")){
    occupation = true;
    counter++;
}
if(line.contains("Construction")){
    construction = true;
    counter++;
}
```

```
    line = lines[index++];
}
test1 = countSIC;
countSIC = 0;
while(true){
    countSIC++;
    line = lines[index++];
    if(inspection){
        //inspecVal = line.split(">")[2].split("<")[0];
        line = lines[index++];
        inspecVal = line.split(">")[2].split("<")[0];
    }
    if(age)
        line = lines[index++];
    if(sex)
        line = lines[index++];
    if(degree){
        line = lines[index++];
        degVal = line.split(">")[1].split("<")[0];
    }
    if(nature){
        line = lines[index++];
        natureVal = line.split(">")[1].split("<")[0];
    }
    if(occupation){
        line = lines[index++];
        ocpVal = line.split(">")[1].split("<")[0];
    }
    if(construction){
```

```
                    line = lines[index++];

                    causeVal = line.split("Cause</b>: ")[1].split("<")[0];

                    fatCauseVal = line.split("FatCause</b>: ")[1].split("<")[0];

                }

                if(rowNum.contains(inspecVal)){

                    numid++;

                    if(!start3)

                        numOff++;

                    System.out.println(accNum + "; " + inspecVal + "; " + titleVal + "; " +
eventDateVal + "; " + endUseVal + "; " +  projTypeVal + "; " + degVal + "; " + natureVal + "; " + ocpVal
+ "; " + causeVal + "; " + fatCauseVal + ";");

                    if(fatCauseVal.equals("") || fatCauseVal.equals("Other") || degVal.equals("")){

                        //degVal.equals("")

                        pw.println(accNum + "; " + inspecVal + "; " + titleVal + "; " + eventDateVal + ";
" + endUseVal + "; " +  projTypeVal + "; " + degVal + "; " + natureVal + "; " + ocpVal + "; " + causeVal
+ "; " + fatCauseVal + ";");

                        pw.flush();

                    }

                    if(uniqueFatCauses.get(fatCauseVal) == null)

                        uniqueFatCauses.put(fatCauseVal, 1);

                    else

                        uniqueFatCauses.put(fatCauseVal, uniqueFatCauses.get(fatCauseVal)+1);

                    allFatCauses.add(fatCauseVal);

                    if(degVal.equals("Non Hospitalized injury")){

                        if(fatDeg1.get(fatCauseVal) == null)

                            fatDeg1.put(fatCauseVal, 1);

                        else

                            fatDeg1.put(fatCauseVal, fatDeg1.get(fatCauseVal)+1);

                    }else if(degVal.equals("Hospitalized injury")){

                        if(fatDeg2.get(fatCauseVal) == null)

                            fatDeg2.put(fatCauseVal, 1);
```

```
                    else
                        fatDeg2.put(fatCauseVal, fatDeg2.get(fatCauseVal)+1);
                }else if(degVal.equals("Fatality")){
                    if(fatDeg3.get(fatCauseVal) == null)
                        fatDeg3.put(fatCauseVal, 1);
                    else
                        fatDeg3.put(fatCauseVal, fatDeg3.get(fatCauseVal)+1);
                }else if(degVal.equals("")){
                    if(fatDeg4.get(fatCauseVal) == null)
                        fatDeg4.put(fatCauseVal, 1);
                    else
                        fatDeg4.put(fatCauseVal, fatDeg4.get(fatCauseVal)+1);
                }else
                    System.out.println("HEREEEE: " + fatCauseVal);
//                  if(fatDeg1.get(fatCauseVal) == null )
//                  MatchCauseDegree mcd = new MatchCauseDegree(fatCauseVal, degVal);
//                  if(fatDeg.get(mcd) == null)
//                      fatDeg.put(mcd, 1);
//                  else{
//                      fatDeg.put(mcd, fatDeg.get(mcd)+1);
//                  }
                natrueList.add(natureVal);
                causeList.add(causeVal);
                fatCauseList.add(fatCauseVal);
            }
            line = lines[index++];
            line = lines[index++];
            if(!line.contains("<tr>")){
                if(test1 != countSIC)
```

```
                    test2++;
                break;
            }
        }
        start1 = false; start2 = false; start3 = false;
        counter = 0; countSIC = 0;rowNum = new ArrayList<String>(); inspecTmpVal = "";
        id  = false; inspection = false; age = false;sex = false;degree = false;nature =
false;occupation = false;construction = false;
        accNum = "";inspecVal = ""; degVal = ""; natureVal = ""; ocpVal = ""; causeVal = "";
fatCauseVal = ""; titleVal = ""; eventDateVal = ""; endUseVal = ""; projTypeVal = "";
      }
    }
  }
  System.out.println("DONE!");
  System.out.println(currUrl);
}
pw.close();
for(String sss: List1)
  System.out.println(sss);
System.out.println("----------------------------------------------------------------");
for(String sss: List2)
  System.out.println(sss);
System.out.println(numOrId + "    " + numid + " ;    " + numOff + ";" +  test2 + ";" + test3 + ";" +
test4);
PrintWriter pw2 = new PrintWriter(new FileWriter("output_unique"+fileNumber+".txt"));
Set<String> uniqueNatures = new HashSet<String>(natrueList);
System.out.println("Unique nature count: " + uniqueNatures.size());
pw2.println("Unique nature count: " + uniqueNatures.size());
pw2.flush();
for(String s: uniqueNatures){
  pw2.println(s);
```

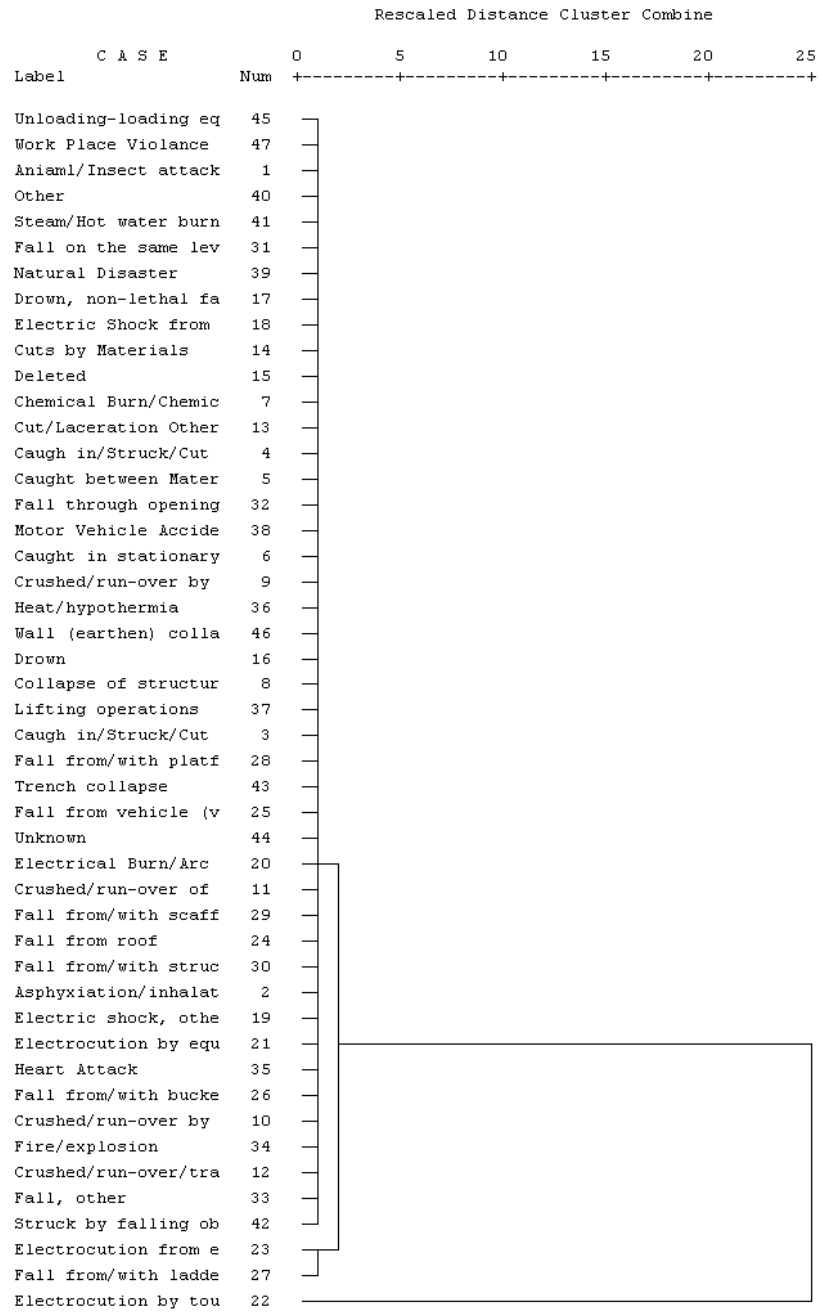
```
            pw2.flush();
        }
        Set<String> uniqueCauses = new HashSet<String>(causeList);
        System.out.println("Unique Cause count: " + uniqueCauses.size());

pw2.println("*****************************************************************************
************************");
        pw2.flush();
        pw2.println("Unique Cause count: " + uniqueCauses.size());
        pw2.flush();
        for(String s: uniqueCauses){
            pw2.println(s);
            pw2.flush();
        }
        //Set<String> uniqueFatCas = new HashSet<String>(fatCauseList);
        pw2.close();
        pw2 = new PrintWriter(new FileWriter("output_FatCause_unique"+fileNumber+".txt"));
        System.out.println("Unique Fatality Cause count: " + uniqueFatCauses.size());
//
pw2.println("*****************************************************************************
************************");
//        pw2.flush();
//        pw2.println("Unique Fatality Cause count: " + uniqueFatCauses.size());
//        pw2.flush();
        Set<String> keyset = uniqueFatCauses.keySet();
        for(String s:keyset){
            pw2.println(s + "; " + uniqueFatCauses.get(s));
            pw2.flush();
        }
        pw2.close();
        pw2 = new PrintWriter(new FileWriter("output_FatCause_Degree_unique"+fileNumber+".txt"));
```

```
        pw2.println("FatCause; Non Hospitalized injury; Hospitalized injury; Fatality; Not specified");

        for(String s:allFatCauses){

            if(fatDeg1.get(s) ==  null)

                fatDeg1.put(s, 0);

            if(fatDeg2.get(s) ==  null)

                fatDeg2.put(s, 0);

            if(fatDeg3.get(s) ==  null)

                fatDeg3.put(s, 0);

            if(fatDeg4.get(s) ==  null)

                fatDeg4.put(s, 0);

            String s2 = s;

            if(s.equals(""))

                s2 = "Not Sepcified";

            pw2.println(s2 + "; " + fatDeg1.get(s) + "; " + fatDeg2.get(s) + "; " + fatDeg3.get(s) + "; " +
fatDeg4.get(s));

            pw2.flush();

        }

        pw2.close();

        System.out.println(numOrId);

        System.out.println(numid);

    }

}
```

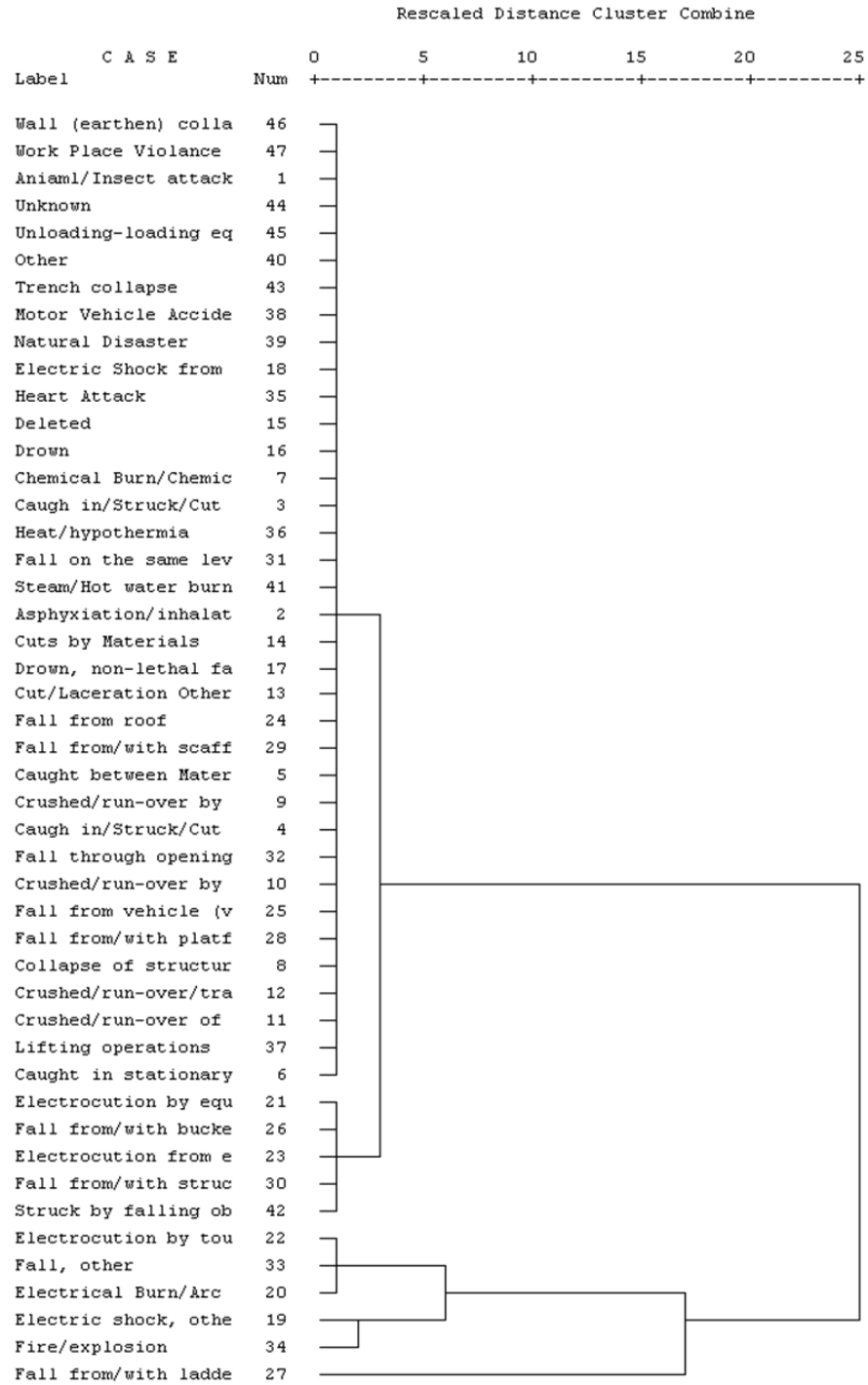
Appendix E: Cluster analysis of risks

For SIC1731:

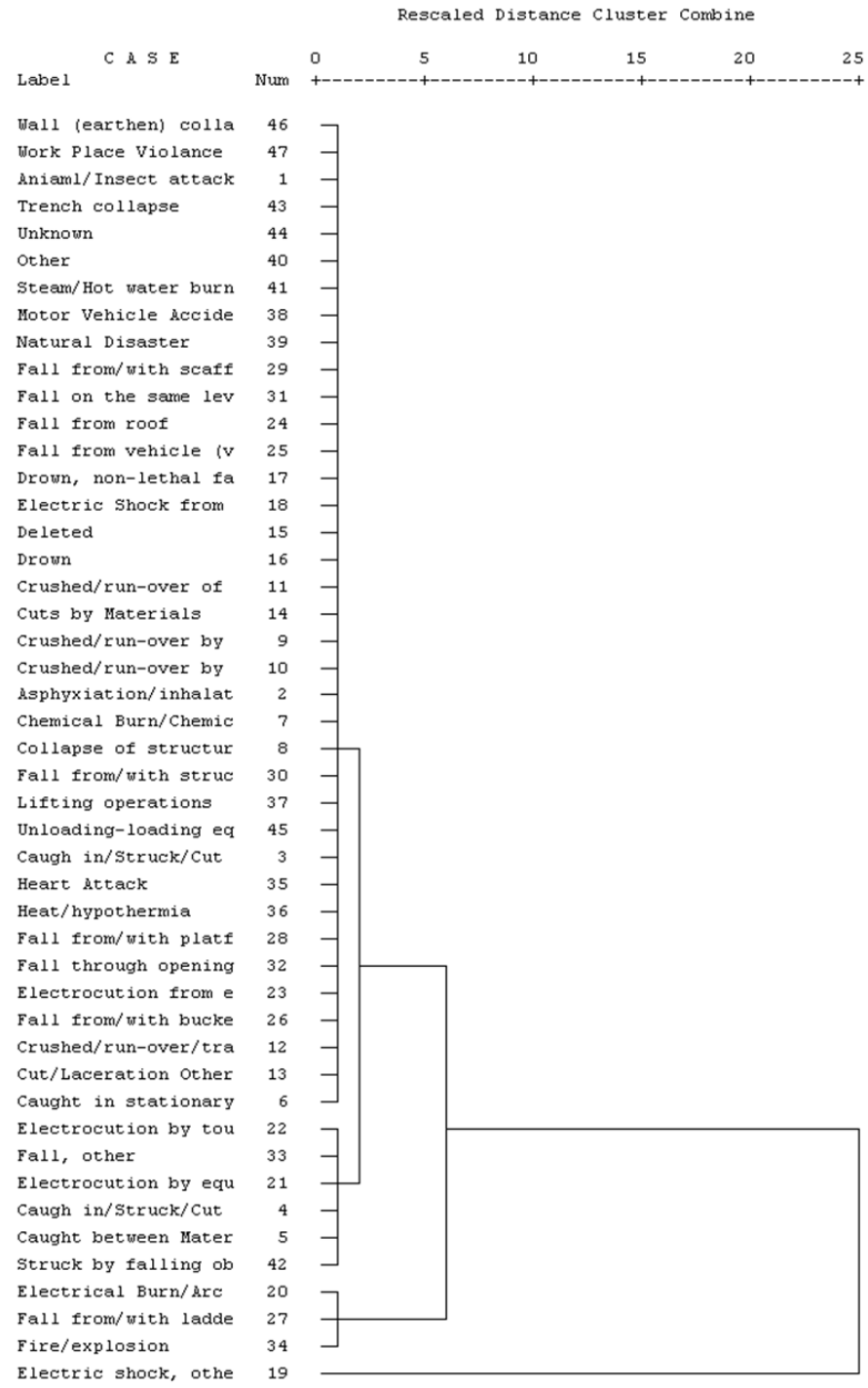
var: Risk Fat ....
Dendrogram using Average Linkage (Between Groups)



var: Risk Hosp ....
Dendrogram using Average Linkage (Between Groups)



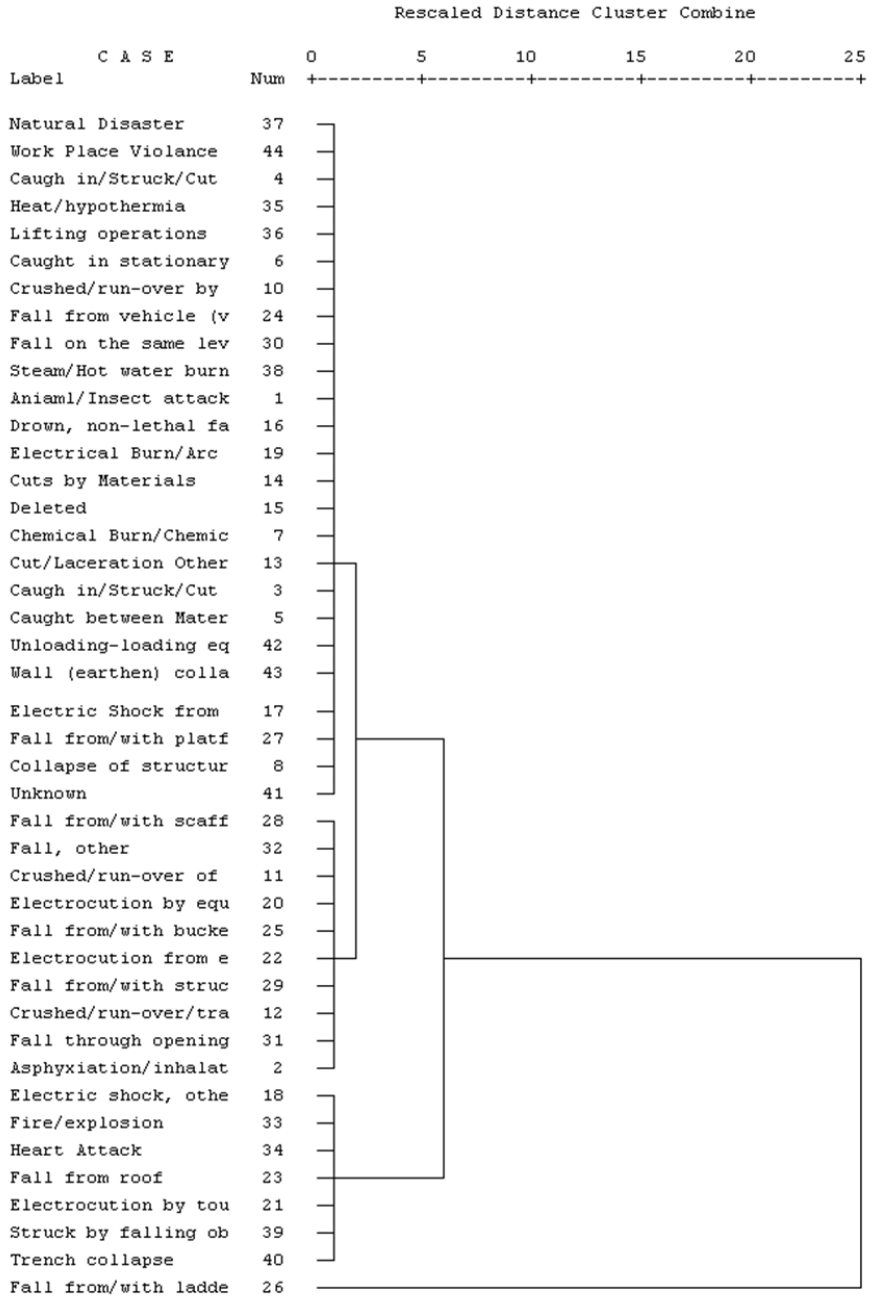
var: Risk Non Hosp ....
Dendrogram using Average Linkage (Between Groups)



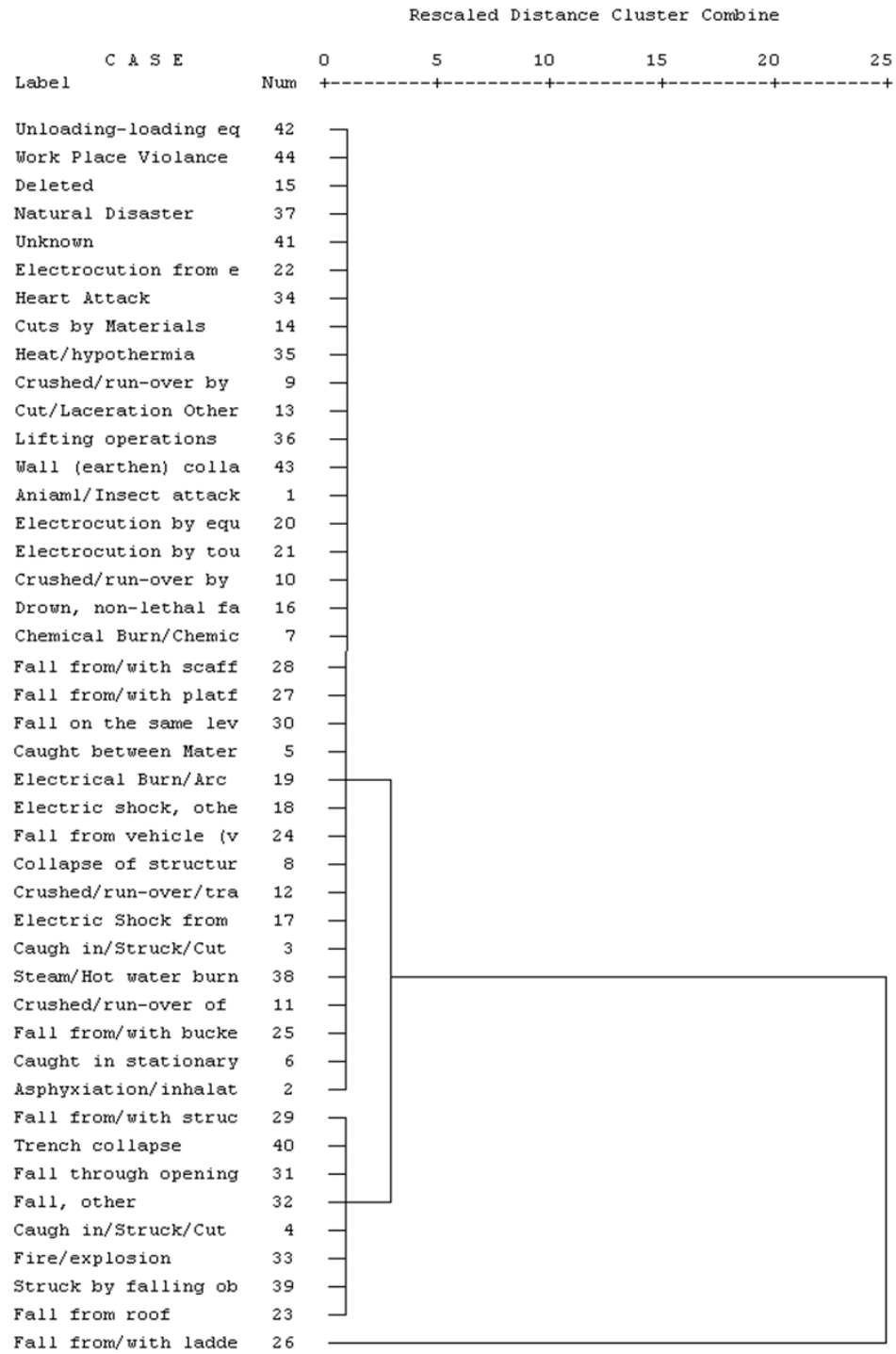
For SIC1711

var: Risk Fat

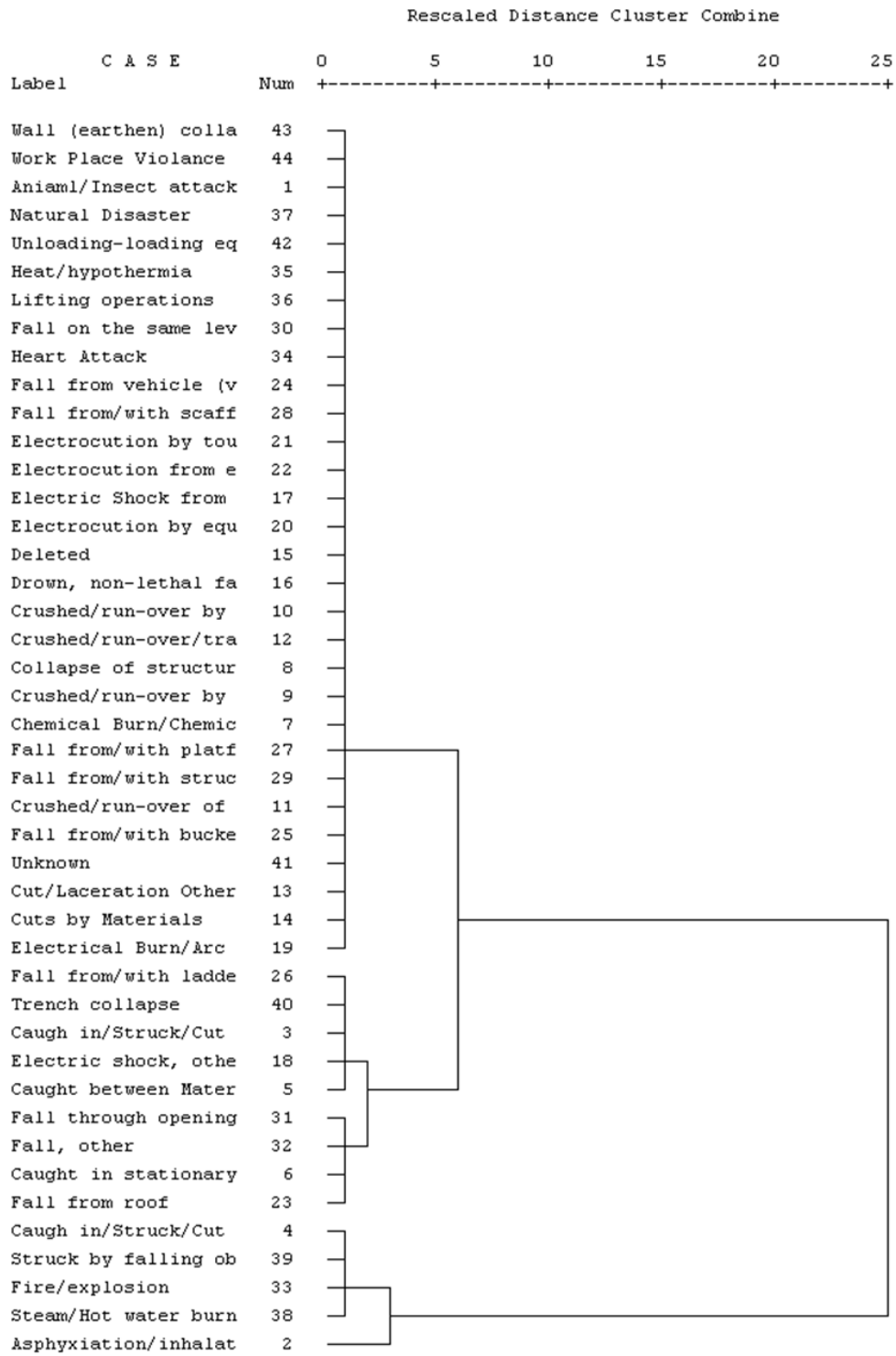
Dendrogram using Average Linkage (Between Groups)



var: Risk Hosp
Dendrogram using Average Linkage (Between Groups)



var: Risk Non
Dendrogram using Average Linkage (Between Groups)



Appendix F: Recruitment communication

Recruitment Communication for Research Study:
Framework for assessing safety performance of construction mechanical and electrical field employees

Dear Reader,

You are invited to take part in this research study as you are identified as being actively involved in mechanical and electrical construction projects. Participation in this study is voluntary. If you consent and understand the explanation of research attached to the survey, please complete the survey form. The purpose of this study is to create a framework to assess the safety performance of the field employees by using perceived risk of tasks, personal attributes, hazard identification skills, and safety knowledge. Participation or non-participation will not affect your relationship with the company or your job performance. There is no direct benefit to you as participant in the research; however, the research will be beneficial to the construction industry as a whole.

If you chose to take part in this survey, you will be asked to provide the following information:

- An estimated frequency of possible injuries according to severity during each task scenario
- Influence of personal attribute factors
- Answer safety knowledge questions
- Identify hazard in given scenarios
- Personal attributes such as title, trade(s), years of experience, etc. **No** name or any form of identification information will be asked.

The survey is expected to take approximately 30 minutes to complete. The survey has minimal risks, and all information that you provide will be accessed only by the researchers. Personal or company names are not required or recorded. Data in these studies will be identified as Pacific Northwest Mechanical and Electrical Construction Companies. If the study is published, no information regarding identity will be made public. For more information about this study, please contact the principal investigators, Ali Moghaddam Vahed at moghadda@onid.oregonstate.edu, or Dr. John Gambatese, by phone at 541-737-8913 or email at john.gambatese@oregonstate.edu.

Thank you,

Ali Moghaddam Vahed
Student Researcher
moghadda@onid.oregonstate.edu
(541) 602-7298

Study Title: Framework for assessing safety performance of construction mechanical and electrical field employees.

Appendix G: Recruitment email

Recruitment Email for Research Study:
Framework for assessing safety performance of construction mechanical and electrical field employees

Dear Reader,

You are invited to take part in this research study as you are identified as being actively involved in mechanical and electrical construction projects. If possible, please have project engineers, project managers and safety professionals who are involved in mechanical and electrical construction fill out this survey, if they consent to it. Please ensure that all persons have access to the Explanation of Research attached to the e-mail. The purpose of this study is to create a framework to assess the safety performance of field employees by using perceived risk of tasks, personal attributes, hazard identification skills, and safety knowledge. Participation or non-participation will not affect your relationship with the company or your job performance.

If you/your employees/co-workers choose to take part in this survey, you will be asked to provide the following information:

- An estimated frequency of possible injuries according to severity for different work tasks
- Influence of personal attribute factors on worker safety performance
- Answers to safety knowledge questions
- Hazards, bad safety practices, and good safety practices for given work scenarios
- Personal attributes such as title, trade(s), years of experience, etc. **No** names or any form of identification information will be requested.

The survey is expected to take approximately 30 minutes to complete. The survey has minimal risks, and all information that you provide will be accessed only by the researchers. Personal and company names are not required or recorded. Survey response data in the study will be identified as Pacific Northwest Mechanical and Electrical Construction Companies. If the study is published, no information regarding respondent or company identity will be made public. For more information about this study, please contact the investigators, Ali Moghaddam Vahed at moghadda@onid.oregonstate.edu, or Dr. John Gambatese, by phone at 541-737-8913 or email at john.gambatese@oregonstate.edu.

Thank you,

Ali Moghaddam Vahed
Student Researcher
moghadda@onid.oregonstate.edu

Study Title: Framework for assessing safety performance of construction mechanical and electrical field employees

Version: 11/25/2014

Appendix H: Survey sample

Safety Survey

This study is being conducted to determine the correlation between perceived risk of work tasks, hazard identification skills, safety knowledge, and personal attributes. These correlations will be used to develop a framework for assessing the likely future safety performance of field employees and determine areas for improvement. Furthermore, the study assesses the perception gap between field and management with respect to construction safety.

Please note that the information you provide will be kept completely confidential, and will only be used to create the proposed framework. Also, no personal or company name will be asked as part of the survey. The data will be remain anonymous and stored in a common database with all of the other respondents, so that the data cannot be traced to a specific individual or company.

Steps to Complete the Survey

This survey consists of five sections. At the beginning of each section, instructions or examples are provided to assist with completing the section. The five sections are as follows:

- Section 1: Influence of personal factors on the safety of field workers.
- Section 2: Assessment of the frequency of possible injuries for different working operations.
- Section 3: Identification of safety hazards, poor work practices, and good work practices.
- Section 4: Level of safety knowledge.
- Section 5: Personal demographics of respondent

Please answer each survey question based on your personal experience on construction sites.

If you have any questions about the survey or your participation in the survey, please contact us:

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Oregon State University
Cell: 541-602-7298
E-mail: moghadda@onid.orst.edu

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Section 1:

Part A:

Using your personal judgment and experience, please indicate whether you agree or disagree with the following statements regarding influence on safety performance of employees:

Statement regarding influence on employee safety performance	Completely Disagree	Disagree	Neutral	Agree	Completely Agree
Personal and demographic attributes (such as age, gender, experience, etc.) of an employee affects the employee's safety performance					
An employee's risk perception affects the employee's safety performance					
An employee's level of safety knowledge affects the employee's safety performance					
The ability of an employee to identify safety hazards influences the employee's safety performance					

Section 1:

Part B:

In this part, the objective is to determine which personal attributes influence the safety performance of a worker. Using your experience and judgment, please indicate whether you agree or disagree with each statement.

Statement regarding influence of personal attributes on safety performance	Completely Disagree	Disagree	Neutral	Agree	Completely Agree
The **age** of an employee influences the employee's safety performance					
An employee's **gender** influences the employee's safety performance					
An employee's **marital status** influences the employee's safety performance					
Having dependents (e.g., children) influences an employee's safety performance					
An employee's level of **work experience** in the trade influences the employee's safety performance					
An employee's level of **education** influences the employee's safety performance					
An employee's **length of service with the company** influences the employee's safety performance					
Having more than one job influences an employee's safety performance					
An employee's safety performance is influenced by whether or not the employee **has experienced injuries that required more than first aid treatment in the past**					
An employee's safety performance is influenced by whether or not the employee **has observed injuries to other workers that required more than first aid treatment in the past**					
Having **formal safety training** like OSHA 10-hour training influences the an employee's safety performance					
An employee's **perception of their job security** influences the employee's safety performance					
Being a **local worker or a traveler** influences an employee's safety performance					
Being a **member of a labor union** influences an employee's safety performance					
The **job level of the employee** (for example, apprentice, foreman, etc.) influences the employee's safety performance					

Using your personal judgment and experience, please rate the impact of each of the following personal attributes on the safety performance of an employee. Provide a rating for each individual attribute.

Impact on Safety performance	Strongly Negative	Negative	Neutral (Not Effecting safety performance)	Positive	Strongly Positive
Rating	**-2**	**-1**	**0**	**1**	**2**

For example: Giving an attribute a rating of "-2"indicates that you feel the attribute has a "strongly negative" impact on safety performance on an employee.

Age (years)	18-19	20-24	25-34	35-44	45-54	55-64	65 and over
Rating							

Length of service with the company	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Rating				

Experience in the trade	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years
Rating				

Education Level	No Formal Education	Elementary School	High School	Higher Education	University
Rating					

Job Level	Apprentice	Journeyman	Foreman/Lead	Supervisors/Superintendent/PM
Rating				

Gender	Male	Female
Rating		

Marital Status	Married or in domestic relationship	Not married
Rating		

Dependents	No dependents	Has at least one dependent
Rating		

Multi-Jobs	One Job	More than one job
Rating		

Employee has had an injury that required more than first aid treatment	Yes	No
Rating		

Employee has observed an injury that required more than first aid treatment	Yes	No
Rating		

Job security perception	Employee feels his/her job is secure	Employee feels that his/her job is not secure
Rating		

Local vs. Traveler	Local	Traveler
Rating		

Union status	Union	Non
Rating		

Section 2:

Activity Risk Perception

In this section, please complete **each** of the "Frequency of Injury" fields in the table below. Using your personal experience and judgment, indicate, for a single worker or work crew, in each of the scenarios, what would be the frequency of injury for different severity levels, using the frequency scale below:

Frequency Scale: Average amount of time between incidents per worker										
Impossible	Negligible	50 years	10 years	5 years	1 year	6 months	1 month	1 week	1 day	1 hr
0	1	2	3	4	5	6	7	8	9	10

Severity	**Description****
Near Miss	No Injury and impact on work time
Non-Hospitalized Injury	Injured employee is able to get back to work on the same day (Incident requiring first aid)
Hospitalized Injury	Injured employee misses work time more than one day (Incident causing lost work time or hospitalization)
Fatality	Employee does not return to work ever (Incident results in death or long-term disability)

**Please note that an incident refers to an injury caused during that specific scenario

An explanatory sample is shown below for your reference.

A "Fatality" is impossible in this scenario

	Scenarios	Frequency for Severity Levels			
		Near Miss	Non-Hospitalized Injury	Hospitalized Injury	Fatality
1	A sheetmetal craft employee is installing a control box in a ceiling grid while standing on a 10-ft tall ladder.	10	4	4	0
2	A pipefitter is installing unsecured, overhead, 2-inch diameter steel pipe in 10-ft long sections. Work is being done from a scissor lift.	8	9	1	3

A "Near Miss" could happen once every hour in this scenario"

A "Non-Hospitalized Injury" could happen once every 5 years in this scenario

The possibility of a "Hospitalized Injury" is negligible in this scenario

For Mechanical Trade

No.	Scenario	Frequency of Injury			
		Near Miss	Non-Hospitalized Injury	Hospitalized Injury	Fatality
1	A sheetmetal craft employee is installing a control box in a ceiling grid while standing on a 10-ft tall ladder.				
2	A pipefitter is installing unsecured, overhead, 2-inch diameter steel pipe in 10-ft long sections. Work is being done from a scissor lift.				
3	A mechanical craft employee is using a Sawzall to cut a hole in a wall to install a chilled water line. The employee did not check whether utilities were present in the wall.				
4	A pipefitter installed a 6-inch PVC line with a temporary cap on the end, and now needs to test the system by pressurizing it.				
5	A service mechanic is conducting maintenance on a rooftop air handler unit which is located 3 feet from the edge of the roof. The roof has a low parapet.				
6	A plumber is using a portable band saw to cut overhead 2-inch steel pipe				
7	A pipefitter is working in a 2-ft wide by 6-ft tall tunnel underneath a building. The worker is welding steel pipe to install ammonia lines.				
8	A pipefitter is operating a pipe threading machine to thread a 3-inch steel sprinkler line.				
9	A plumber is installing an underground sewer line in a 4-ft deep excavation on a small site. A backhoe is working on a trenching operation nearby.				
10	A mechanical craft employee is moving pipe on a summer day in a hot climate area.				
11	A service technician is repairing a steam pipe hanger on a live line.				

Frequency Scale: Average amount of time between incidents per worker										
Impossible	Negligible	50 years	10 years	5 years	1 year	6 months	1 month	1 week	1 day	1 hr
0	1	2	3	4	5	6	7	8	9	10

For Electrical Trade

No.	Scenario	Frequency of Injury			
		Near Miss	Non-Hospitalized Injury	Hospitalized Injury	Fatality
1	An electrician is diagnosing a heating unit panel (480V) in a ceiling grid while the unit is operating. The work is being done from a scissor lift.				
2	An electrician is diagnosing a heating unit panel (480V) in a ceiling grid while the unit is operating. The work is being done from a ladder.				
3	An electrician is working on a de-energized panel while other trades are installing conduit overhead from a platform nearby.				
4	An owner requests an electrician to secure an old panel cover and door while it is energized. The condition of the panel inside is unknown to the electrician.				
5	An electrician is demolishing an old light fixture on a wall and replacing it with a new fixture.				
6	An electrician is cutting an unsecured conduit using a portable band saw.				
7	An electrician is placing underground conduit while heavy equipment operates nearby in the surrounding area.				
8	An electrician is working from a ladder near an elevator shaft opening. The shaft opening has top and mid-guardrails surrounding the opening.				
9	An electrician is installing hangers for conduit on roof during the summertime. The weather is hot, and fall protection provided around roof edge				
10	A data line installer is moving materials with a cart out of a construction storage unit.				
11	A data craft employee is pulling wire for the construction of a data center.				

Frequency Scale: Average amount of time between incidents per worker										
Impossible	Negligible	50 years	10 years	5 years	1 year	6 months	1 month	1 week	1 day	1 hr
0	1	2	3	4	5	6	7	8	9	10

Section 3:

In this section, please identify the hazards present, bad safety practices, and good safety practices for the actions/conditions shown in each of the pictures using your own judgment and experience. An example is provided below. Please note that when identifying the hazards, write all of the hazards that you can identify regardless of the practice. For example, the tool is insulated and shown to be used correctly; however, the electrical hazard still exists.

Example:

Hazards Present	• Fall hazard • Electrical hazard • Struck by hazard
Bad Safety Practices	• Incorrect ladder use • No safety glasses
Good Safety Practices	• Proper tool handling (using the tool bag)

Scenario 1:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Scenario 2:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Scenario 3:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Scenario 4:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Scenario 5:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Scenario 6:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Scenario 7:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Scenario 8:

Hazards Present	
Bad Safety Practices	
Good Safety Practices	

Section 4:

Please answer the following questions to the best of your knowledge by circling the correct answer:

1. **One of the main responsibilities employers have under OSHA is to:**
   a) Provide training required by OSHA standards.
   b) Reduce air pollution in the environment.
   c) Conduct energy audits.
   d) Notify OSHA of any workplace injury or illness.
2. **In general, fall protection must be provided to construction workers who are working on surfaces with unprotected sides and edges which are ____ above the lower level:**
   a) 3 feet b) 4 feet c) 6 feet d) 10 feet
3. **A ground fault circuit interrupter (GFCI):**
   a) Detects ground faults and interrupts the flow of electric current, and is designed to protect the worker by limiting the duration of an electrical shock.
   b) Detects ground faults and interrupts the electric source thus, it disables the equipment that is attached; however, the worker is still exposed to electrocution.
   c) A tool used to determine if a power system is properly grounded.
4. **A struck-by hazard can be described as anytime a worker _____.**
   a) Falls from a height of greater than ten feet
   b) Is hit by a falling, swinging, flying or rolling object
   c) Can get any part of his/her body caught in or in between objects
5. **To prevent being pinned between equipment or other objects, workers should avoid _____.**
   a) Using a trench box or shield during excavation work
   b) Placing themselves between moving vehicles and an immovable structure, vehicle, or staked materials
   c) Removing a safety guard when a tool such as, a circular saw or power drill, is being used.
6. **Some common foot hazard include:**
   a) Compression b) Puncture c) Extreme heat or cold d) All the above
7. **Asbestos fibers can enter the body by:**
   a) Osmosis b) Inhalation c) Ingestion d) b and c
8. **Work area control for crane and hoist operations can be recognized by the use of:**
   a) Warning lines b)Tag out devices c)Lockout devices d)Fall protection
9. **The hazard considered to be the greatest in excavation work is:**
   a) Falls
   b) Cave-ins
   c) Severing underground utility
   d) Equipment falling in trench
10. **If a seat belt is provided on equipment, you don't have to use it**
    a) True b)False
11. **Before a suspension scaffold may be used, the connections must be checked by a:**
    a) Qualified person
    b) Competent person
    c) Company owner
    d) Customer
12. **When using a portable ladder, the side rail should extend at least ____ above the upper landing surface.**
    a) 1 foot
    b) 3 feet
    c) 5 feet
    d) 12 feet
13. **Machine guards protect operators from:**
    a) Finished product
    b) Stationary parts
    c) Flying chips and sparks or Flying parts
    d) All of the above

Section 5:

Please answer the following demographic questions. No personal or company name is requested. All of the data provided will be pooled anonymously into one database.

Please circle the group that correlates the most to you.							
Age (years)	18-19	20-24	25-34	35-44	45-54	55-64	65 and over
Length of service with the current company	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years			
Education Level	No Formal Education	Elementary School	High school	Higher Education	University		
Job Level	Apprentice	Journeyman	Foreman/Lead	Supervisors/Superintendent/PM/PE	Safety		
Gender	Male	Female					
Experience in the trade	Less than 3 months	3-11 Months	1-5 Years	More than 5 Years			
Marital Status	Married or in domestic relationship	Not married					
Dependents	No dependents	Have at least one dependent					
How many jobs do you have?	Have only one job	More than one job					
Job security perception	I feel I have job security	I feel I don't have job security					
Are you a local or traveler?	Local	Traveler					
Union status	Union	Non-Union					
I have had an injury that required more than first aid treatment				Yes	No		
I have observed an injury that required more than first aid treatment				Yes	No		

Appendix I: Safety knowledge questions

Section 4:

Please answer the following questions to the best of your knowledge by circling the correct answer:

1. **One of the main responsibilities employers have under OSHA is to:**
   a) Provide training required by OSHA standards.
   b) Reduce air pollution in the environment.
   c) Conduct energy audits.
   d) Notify OSHA of any workplace injury or illness.
2. **In general, fall protection must be provided to construction workers who are working on surfaces with unprotected sides and edges which are ____ above the lower level:**
   a) 3 feet b) 4 feet c) 6 feet d) 10 feet
3. **A ground fault circuit interrupter (GFCI):**
   a) Detects ground faults and interrupts the flow of electric current, and is designed to protect the worker by limiting the duration of an electrical shock.
   b) Detects ground faults and interrupts the electric source thus, it disables the equipment that is attached; however, the worker is still exposed to electrocution.
   c) A tool used to determine if a power system is properly grounded.
4. **A struck-by hazard can be described as anytime a worker _____.**
   a) Falls from a height of greater than ten feet
   b) Is hit by a falling, swinging, flying or rolling object
   c) Can get any part of his/her body caught in or in between objects
5. **To prevent being pinned between equipment or other objects, workers should avoid _____.**
   a) Using a trench box or shield during excavation work
   b) Placing themselves between moving vehicles and an immovable structure, vehicle, or staked materials
   c) Removing a safety guard when a tool such as, a circular saw or power drill, is being used.
6. **Some common foot hazard include:**
   a) Compression b) Puncture c) Extreme heat or cold d) All the above
7. **Asbestos fibers can enter the body by:**
   a) Osmosis b) Inhalation c) Ingestion d) b and c
8. **Work area control for crane and hoist operations can be recognized by the use of:**
   a) Warning lines b)Tag out devices c)Lockout devices d)Fall protection
9. **The hazard considered to be the greatest in excavation work is:**
   a) Falls
   b) Cave-ins
   c) Severing underground utility
   d) Equipment falling in trench
10. **If a seat belt is provided on equipment, you don't have to use it**
    a) True b)False
11. **Before a suspension scaffold may be used, the connections must be checked by a:**
    a) Qualified person
    b) Competent person
    c) Company owner
    d) Customer
12. **When using a portable ladder, the side rail should extend at least ____ above the upper landing surface.**
    a) 1 foot
    b) 3 feet
    c) 5 feet
    d) 12 feet
13. **Machine guards protect operators from:**
    a) Finished product
    b) Stationary parts
    c) Flying chips and sparks or Flying parts
    d) All of the above

Appendix J1: Comparing the perception of different Age groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Personal is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.489	Retain the null hypothesis.
2	The distribution of RiskPerception is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.085	Retain the null hypothesis.
3	The distribution of SafetyKnowledge is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.827	Retain the null hypothesis.
4	The distribution of HazardIdentification is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.532	Retain the null hypothesis.
5	The distribution of Age is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.041	Reject the null hypothesis.
6	The distribution of Gender is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.115	Retain the null hypothesis.
7	The distribution of MaritalStatus is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.234	Retain the null hypothesis.
8	The distribution of Dependents is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.117	Retain the null hypothesis.
9	The distribution of WorkExperience is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.777	Retain the null hypothesis.
10	The distribution of Education is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.979	Retain the null hypothesis.
11	The distribution of LengthofService is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.426	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.400	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.784	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.162	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.089	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.162	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.623	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.205	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.008	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.361	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.356	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.772	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.184	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.516	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.607	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.712	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.204	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.024	Reject the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.097	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.253	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.690	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.290	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.140	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.400	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.239	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.705	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.577	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.392	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.322	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.779	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.005	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.020	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.996	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.349	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.446	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.129	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.105	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.224	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.579	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.733	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.820	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.137	Retain the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.375	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.670	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.055	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.227	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.170	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.484	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.673	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.747	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.834	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.417	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.824	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.175	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.713	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.663	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.905	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.404	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.342	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.277	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.376	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.857	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.640	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.545	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.894	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
81	The distribution of M5D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.356	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.839	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.396	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.529	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.922	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.169	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.500	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.211	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.963	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.530	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.544	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.335	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.560	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.737	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.842	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.858	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.824	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.546	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.911	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.914	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.998	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.872	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.807	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.804	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.738	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.607	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.537	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.722	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.644	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.895	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.762	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.759	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.500	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.599	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.661	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.710	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.859	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.564	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.464	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.363	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.880	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.203	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.607	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.283	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.749	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.419	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.280	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.474	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.900	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.826	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.684	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.329	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.944	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.790	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.706	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.645	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.795	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.942	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.897	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.368	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.487	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.951	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.420	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.502	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.883	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.978	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.812	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.811	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.060	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.896	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.015	Reject the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.216	Retain the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.174	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.115	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.285	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.282	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.101	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.177	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.423	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.606	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.251	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.099	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.080	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.041	Reject the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.148	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.408	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.279	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.492	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.634	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.182	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.877	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.342	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.488	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.356	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.363	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.290	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.115	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoAge.	Independent-Samples Kruskal-Wallis Test	.164	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J2: Comparing the perception of groups having different length of service within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.041	Reject the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.070	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.096	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.667	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.629	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.765	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.464	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.074	Retain the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.837	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.764	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.315	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.021	Reject the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.424	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.188	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.636	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.799	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.045	Reject the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.058	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.822	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.869	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.651	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.842	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.270	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.338	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.511	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.243	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.530	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.206	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.051	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.190	Retain the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.067	Retain the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.126	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.270	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.052	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.104	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.146	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.253	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.161	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.426	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.546	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.020	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.518	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.266	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.503	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.854	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.758	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.840	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.943	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.296	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.652	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.291	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.865	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.569	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.077	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.320	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.977	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.234	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.363	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.310	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.148	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.629	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.567	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.371	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.427	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.708	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.809	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.654	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.315	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.854	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.809	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.613	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.185	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.302	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.663	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.455	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.434	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.909	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.039	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.659	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.877	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.802	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.717	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.311	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.648	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.895	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.874	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.212	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.534	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.709	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.225	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.207	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.460	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.592	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.654	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.291	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.136	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.288	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.621	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.309	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.235	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.097	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.070	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.095	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.402	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.650	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.677	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.883	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.388	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.651	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.523	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.243	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.537	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.743	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.688	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.865	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.345	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.427	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.458	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.522	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.151	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.346	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.183	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.237	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.385	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.350	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.454	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.249	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.320	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.525	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.175	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.837	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.178	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.598	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.524	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.333	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.119	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.394	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.889	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.132	Retain the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.737	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.444	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.996	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.276	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.565	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.562	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.564	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.315	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.269	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.057	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.415	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.687	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.926	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.475	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.787	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.532	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.384	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.918	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.224	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.145	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.192	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.731	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.043	Reject the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.138	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.565	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.338	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.117	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoLength.	Independent-Samples Kruskal-Wallis Test	.018	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J3: Comparing the perception of different Education groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Personal is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.270	Retain the null hypothesis.
2	The distribution of RiskPerception is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.179	Retain the null hypothesis.
3	The distribution of SafetyKnowledge is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.790	Retain the null hypothesis.
4	The distribution of HazardIdentification is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.336	Retain the null hypothesis.
5	The distribution of Age is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.056	Retain the null hypothesis.
6	The distribution of Gender is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.021	Reject the null hypothesis.
7	The distribution of MaritalStatus is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
8	The distribution of Dependents is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.345	Retain the null hypothesis.
9	The distribution of WorkExperience is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
10	The distribution of Education is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.893	Retain the null hypothesis.
11	The distribution of LengthofService is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.895	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.172	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.862	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.978	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.739	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.571	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.024	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.823	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.985	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.831	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.931	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.533	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.801	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.512	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.652	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.343	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.312	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.188	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.095	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.409	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.992	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.058	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.219	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.406	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.351	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.378	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.858	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.493	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.031	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.037	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.330	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.153	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.134	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.016	Reject the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.030	Reject the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.781	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.390	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.409	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.791	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.011	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.382	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.236	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.402	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.751	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.275	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.530	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.398	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.919	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.368	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.966	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.772	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.421	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.976	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.734	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.218	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.108	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.122	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.760	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.269	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.591	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.957	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.372	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.535	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.165	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.137	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.383	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.513	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.379	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.231	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.353	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.598	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.561	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.151	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.761	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.414	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.508	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.459	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.802	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.410	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.380	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.963	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.924	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.470	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.083	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.854	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.362	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.312	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.054	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.155	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.426	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.703	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.494	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.041	Reject the null hypothesis.
111	The distribution of E2B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.157	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.636	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.532	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.091	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.263	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.022	Reject the null hypothesis.
118	The distribution of E4A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.250	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.087	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.482	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.528	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.453	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.744	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.861	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.836	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.628	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.340	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.409	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.894	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.607	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.846	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.237	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.610	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.805	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.530	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.390	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.486	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.615	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.618	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.236	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.778	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.694	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.844	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.196	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.949	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.900	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.792	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.502	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.040	Reject the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.135	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.480	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.050	Retain the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.834	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.808	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.859	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.330	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.333	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.496	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.948	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.462	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.959	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.138	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.759	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.478	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.235	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.749	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.614	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.207	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.065	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.380	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.680	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.325	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.025	Reject the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.687	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.632	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.817	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.258	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.165	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoEducation.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J4: Comparing the perception of groups with different Job Level within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Personal is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.829	Retain the null hypothesis.
2	The distribution of RiskPerception is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.123	Retain the null hypothesis.
3	The distribution of SafetyKnowledge is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.447	Retain the null hypothesis.
4	The distribution of HazardIdentification is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.277	Retain the null hypothesis.
5	The distribution of Age is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.214	Retain the null hypothesis.
6	The distribution of Gender is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.558	Retain the null hypothesis.
7	The distribution of MaritalStatus is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.748	Retain the null hypothesis.
8	The distribution of Dependents is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.680	Retain the null hypothesis.
9	The distribution of WorkExperience is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.538	Retain the null hypothesis.
10	The distribution of Education is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.762	Retain the null hypothesis.
11	The distribution of LengthofService is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.563	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.184	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.809	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.321	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.150	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.019	Reject the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.442	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.269	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.256	Retain the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.158	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.102	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.496	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.267	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.040	Reject the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.052	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.470	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.577	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.218	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.070	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.100	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.342	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.091	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.521	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.209	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.076	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.349	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.287	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.394	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.089	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.379	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.082	Retain the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.045	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.259	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.208	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.019	Reject the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.112	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.756	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.060	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.357	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.157	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.481	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.345	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.354	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.209	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.024	Reject the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.151	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.593	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.545	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.160	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.634	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.121	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.838	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.160	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.439	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.628	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.936	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.105	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.300	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.358	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.408	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.891	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.858	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.770	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.771	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.577	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.255	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.614	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.107	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.283	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.625	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.704	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.011	Reject the null hypothesis.
87	The distribution of M7B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.383	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.663	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.897	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.081	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.433	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.549	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.882	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.093	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.814	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.763	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.664	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.995	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.695	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.800	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.258	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.401	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.065	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.241	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.549	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.257	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.615	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.522	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.265	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.390	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.762	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.460	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.699	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.464	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.713	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.857	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.209	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.769	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.796	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.667	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.259	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.101	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.137	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.779	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.585	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.838	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.692	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.301	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.754	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.748	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.515	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.893	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.899	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.126	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.261	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoJobLevel	Independent-Samples Kruskal-Wallis Test	.451	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.828	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.116	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.404	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.981	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.328	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.136	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.463	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.042	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.311	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.014	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.299	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.084	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.075	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.037	Reject the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.187	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.045	Reject the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.009	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.675	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.085	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.080	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.088	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.074	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.083	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.111	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.011	Reject the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.093	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.027	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.098	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.012	Reject the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.211	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.550	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.888	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.047	Reject the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.142	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.172	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.089	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.016	Reject the null hypothesis.
182	The distribution of Test is the same across categories of DemoJobLevel.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J5: Comparing the perception of Gender groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Personal is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
2	The distribution of RiskPerception is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.112	Retain the null hypothesis.
3	The distribution of SafetyKnowledge is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.887	Retain the null hypothesis.
4	The distribution of HazardIdentification is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.288	Retain the null hypothesis.
5	The distribution of Age is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.239	Retain the null hypothesis.
6	The distribution of Gender is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.427	Retain the null hypothesis.
7	The distribution of MaritalStatus is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.662	Retain the null hypothesis.
8	The distribution of Dependents is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
9	The distribution of WorkExperience is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.399	Retain the null hypothesis.
10	The distribution of Education is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.695	Retain the null hypothesis.
11	The distribution of LengthofService is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.590	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.203	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.873	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.469	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.699	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.208	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.627	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.038	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.089	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.398	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.231	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.115	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.148	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.544	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.228	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.273	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.254	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.293	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.146	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.862	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.858	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.180	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.771	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.013	Reject the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.016	Reject the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.125	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.225	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.280	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.047	Reject the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.178	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.031	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.021	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.733	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.101	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.401	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.984	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.949	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.565	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.390	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.084	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.493	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.058	Retain the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.900	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.714	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.898	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.209	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.450	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.831	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.752	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.549	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.445	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.827	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.700	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.545	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.598	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.488	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.902	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.537	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.911	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.391	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.455	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.631	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.240	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.094	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.317	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.990	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.517	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.681	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.395	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.110	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.461	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.534	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.364	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.027	Reject the null hypothesis.
86	The distribution of M7A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.623	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.497	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.737	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.130	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.791	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.196	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.253	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.193	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.581	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.527	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.418	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.724	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.988	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.976	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.537	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.522	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.204	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.167	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.322	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.688	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.578	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.633	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.095	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.937	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.292	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.751	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.180	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.529	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.811	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.636	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.795	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.041	Reject the null hypothesis.
119	The distribution of E4B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.202	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.154	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.936	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.473	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.749	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.227	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.203	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.937	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.090	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.813	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.870	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.303	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.125	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.875	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.387	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.810	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.873	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.205	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.805	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.802	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.815	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.688	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.414	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.065	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.556	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.281	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.070	Retain the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.766	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.192	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.320	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.229	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.597	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.256	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.320	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.497	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.369	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.050	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.088	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.522	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.213	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.067	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.414	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.856	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.917	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.151	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.752	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.361	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.533	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.682	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.152	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.560	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.111	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.214	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.317	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoJender.	Independent-Samples Kruskal-Wallis Test	.174	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J6: Comparing the perception of different Experience groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.025	Reject the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.100	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.080	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.009	Reject the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.081	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.124	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.251	Retain the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.065	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.755	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.254	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.187	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.239	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.344	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.232	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.052	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.093	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.073	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.291	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.229	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.080	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.157	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.221	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.144	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.147	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.020	Reject the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.215	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.718	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.053	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.055	Retain the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.025	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.684	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.156	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.149	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.157	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.991	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.487	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.681	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.008	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.196	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.427	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.149	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.577	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.521	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.135	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.717	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.119	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.225	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.320	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.391	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.134	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.867	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.222	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.244	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.395	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.284	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.953	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.289	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.512	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.479	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.201	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.111	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.420	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.845	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.829	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.411	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
81	The distribution of M5D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.189	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.529	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.870	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.455	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.292	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.469	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.464	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.801	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.358	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.702	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.172	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.374	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.457	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.566	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.736	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.674	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.868	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.549	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.507	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.578	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.397	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.944	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.584	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.741	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.490	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.654	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.723	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.641	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.669	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.813	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.170	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.352	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.364	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.784	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.744	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.922	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.407	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.558	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.133	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.075	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.350	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.402	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.563	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.907	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.572	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.896	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.959	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.845	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.363	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.527	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.575	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.752	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.703	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.681	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.878	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.886	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.437	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.052	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.294	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.776	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.278	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.289	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.928	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.937	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.469	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.643	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.493	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.041	Reject the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.669	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.038	Reject the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.013	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.729	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.223	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.051	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.308	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.686	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.295	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.512	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.532	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.343	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.129	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.040	Reject the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.131	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.012	Reject the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.285	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.067	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.965	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.256	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.148	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.578	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.548	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.599	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.763	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.242	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.736	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.142	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.185	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.112	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoExperience.	Independent-Samples Kruskal-Wallis Test	.398	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J7: Comparing the perception of marital groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.138	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.894	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.532	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.204	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.699	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.309	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.232	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.042	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.693	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.682	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.758	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.606	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.419	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.656	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.971	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.217	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.566	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.979	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.395	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.672	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.924	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.375	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.808	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.136	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.228	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.030	Reject the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.441	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.336	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.466	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.022	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.373	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.162	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.149	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.592	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.286	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.555	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.066	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.947	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.521	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.033	Reject the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.652	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.605	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.116	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.563	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.200	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.292	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.228	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.406	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.213	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.225	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.404	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.117	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.096	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.645	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.497	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.193	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.198	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.285	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.154	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.131	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.131	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.344	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.435	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.545	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.255	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.697	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.550	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.489	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.272	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.370	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.421	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.599	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.557	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.351	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.302	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.478	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.527	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.549	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.909	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.755	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.641	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.732	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.836	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.970	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.397	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.586	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.374	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.795	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.460	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.381	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.829	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.718	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.773	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.828	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.658	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.886	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.567	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.668	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.772	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.668	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.478	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.721	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.384	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.249	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.164	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.562	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.772	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.558	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.098	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.348	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.255	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.283	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.464	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.775	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.566	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.553	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.539	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.665	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.943	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.886	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.420	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.668	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.199	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.245	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.124	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.562	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.349	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.551	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.704	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.570	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.473	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.884	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.236	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.109	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.219	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.005	Reject the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.917	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.442	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.522	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.710	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.974	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.424	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.315	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.053	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.162	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.327	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.108	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.672	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.109	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.974	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.876	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.572	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.590	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.291	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.864	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.922	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.182	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.873	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.704	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.151	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.217	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoMarital.	Independent-Samples Kruskal-Wallis Test	.051	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J8: Comparing the perception of workers having or not having dependents within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.137	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.033	Reject the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.515	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.352	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.573	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.022	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.444	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.898	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.257	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.242	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.078	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.950	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.934	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.937	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.810	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.973	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.409	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.676	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.775	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.179	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.684	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.043	Reject the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.106	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.035	Reject the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.484	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.743	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.512	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.412	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.480	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.145	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.037	Reject the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.505	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.411	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.174	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.441	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.603	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.330	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.082	Retain the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.422	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.675	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.171	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.175	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.741	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.202	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.080	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.257	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.313	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.020	Reject the null hypothesis.
65	The distribution of M1D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.461	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.186	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.073	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.103	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.202	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.119	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.073	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.074	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.275	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.211	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.079	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.772	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.119	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.188	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.055	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.095	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.372	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.206	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.336	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.397	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.109	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.178	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.297	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.133	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.074	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.108	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.544	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.661	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.289	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.398	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.165	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.410	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.367	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.461	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.324	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.130	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.181	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.055	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.084	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.731	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.683	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.838	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.733	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.733	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.487	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.225	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.374	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.177	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.137	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.787	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.632	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.455	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.112	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.375	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.584	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.730	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.585	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.892	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.840	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.345	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.416	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.442	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.246	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.341	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.580	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.312	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.686	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.732	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.246	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.029	Reject the null hypothesis.
143	The distribution of E10B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.175	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.232	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.667	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.284	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.199	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.371	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.529	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.052	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.246	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.020	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.617	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.996	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.762	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.114	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.125	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.589	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.808	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.125	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.702	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.104	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.370	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.188	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.398	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.817	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.588	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.087	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.366	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.295	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.736	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.015	Reject the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.378	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.334	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.380	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.325	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.124	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.039	Reject the null hypothesis.
182	The distribution of Test is the same across categories of DemoDependents.	Independent-Samples Kruskal-Wallis Test	.323	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J9: Comparing the perception of workers with different job numbers within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.200	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.194	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.415	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.588	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.940	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.816	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.115	Retain the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.203	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.023	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.040	Reject the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.877	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.884	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.752	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.536	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.196	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.948	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.911	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.967	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.142	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.103	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.330	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.818	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.722	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.005	Reject the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.045	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.023	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.740	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.173	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.287	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.064	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.083	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.211	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.399	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.130	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.467	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.971	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.774	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.913	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.353	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.408	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.958	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.781	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.442	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.655	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.762	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.935	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.476	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.498	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.927	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.513	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.238	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.352	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.615	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.052	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.085	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.035	Reject the null hypothesis.
77	The distribution of M4D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.860	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.168	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.602	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.333	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.293	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.140	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.136	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.127	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.134	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.386	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.313	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.756	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.303	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.282	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.247	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.560	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.234	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.911	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.399	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.849	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.273	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.493	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.447	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.663	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.242	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.276	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.530	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.836	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.454	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.376	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.029	Reject the null hypothesis.
110	The distribution of E2A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.247	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.071	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.155	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.059	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.458	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.172	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.251	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.158	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.281	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.682	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.587	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.629	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.195	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.171	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.214	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.139	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.496	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.544	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
130	The distribution of E7A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.419	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.588	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.402	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.277	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.497	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.058	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.058	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.027	Reject the null hypothesis.
138	The distribution of E9A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.121	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.069	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.150	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.246	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.784	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.197	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.232	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.223	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.789	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.344	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.731	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.328	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.020	Reject the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.763	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.163	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.174	Retain the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.101	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.974	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.258	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.189	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.819	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.974	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.506	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.060	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.094	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.120	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.089	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.169	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.396	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.233	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.418	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.520	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.853	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.128	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.472	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.165	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.894	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.364	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.405	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.512	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.430	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.465	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.137	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoJobNumber.	Independent-Samples Kruskal-Wallis Test	.252	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J10: Comparing the perception of Job Security groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.038	Reject the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.215	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.054	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.136	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.420	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.183	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.661	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.279	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.189	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.059	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.005	Reject the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.012	Reject the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.602	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.466	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.941	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.246	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.598	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.072	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.795	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.376	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.600	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.701	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.851	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.661	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.351	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.607	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.036	Reject the null hypothesis.
46	The distribution of Married is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.064	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.593	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.126	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.844	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.213	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.622	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.091	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.120	Retain the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.060	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.891	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.621	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.943	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.153	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.610	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.952	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.070	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.887	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.534	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.161	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.717	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.057	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.112	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.613	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.923	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.075	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.144	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.055	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.237	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.218	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.980	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.036	Reject the null hypothesis.
79	The distribution of M5B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.192	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.084	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.087	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
83	The distribution of M6B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.111	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.442	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.222	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.021	Reject the null hypothesis.
87	The distribution of M7B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.118	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.106	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.107	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.418	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.066	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.138	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.440	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.480	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.367	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.401	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.296	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.141	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.282	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.703	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.285	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
103	The distribution of M11B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.217	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.187	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.688	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.578	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.811	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.937	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.292	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.751	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.581	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.059	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.231	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.386	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.795	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.529	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.632	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.476	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.936	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.473	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.811	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.629	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.203	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.340	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.347	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.431	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.333	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.753	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.870	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.310	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.527	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.813	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.747	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.875	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.814	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.936	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.472	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.692	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.805	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.802	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.584	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.813	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.809	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.414	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.064	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.899	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.458	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.017	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.195	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.246	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.050	Reject the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.037	Reject the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.068	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.366	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.038	Reject the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.374	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.110	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.212	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.518	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.007	Reject the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.008	Reject the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.546	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.045	Reject the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.028	Reject the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.451	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.530	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.830	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.088	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.273	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.044	Reject the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.005	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
182	The distribution of Test is the same across categories of DemoJobSecurity.	Independent-Samples Kruskal-Wallis Test	.243	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J11: Comparing the perception of Local-Traveler groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.145	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.187	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.199	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.658	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.772	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.825	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.052	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.010	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.814	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.221	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.784	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.213	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.925	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.758	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.596	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.495	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.776	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.545	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.369	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.757	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.223	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.476	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.086	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.237	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.189	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.822	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.970	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.626	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.014	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.008	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.771	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.114	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.107	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.494	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.292	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.313	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.653	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.691	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.058	Retain the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.884	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.719	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.709	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.134	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.150	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.388	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.735	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.899	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.127	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.609	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.538	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.953	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.325	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.979	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.603	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.434	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.247	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.258	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.350	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.805	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.658	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.573	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.858	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.271	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.528	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.336	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.222	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.905	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.649	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.637	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.254	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.323	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.405	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.402	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.555	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.509	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.173	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.314	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.323	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.928	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.397	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.454	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.931	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.817	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.977	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.355	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.690	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.561	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.787	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.519	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.701	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.376	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.612	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.375	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.800	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.796	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.900	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.706	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.316	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.525	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.802	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.407	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.531	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.309	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.207	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.521	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.099	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.098	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.095	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.059	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.800	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.617	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.900	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.304	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.531	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.450	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.435	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.281	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.206	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.101	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.102	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.094	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.452	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.707	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.702	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.589	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.703	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.239	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.894	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.901	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.706	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.898	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.941	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.684	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.039	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.146	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.113	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.309	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.146	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.044	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.261	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.107	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.061	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.016	Reject the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.072	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.122	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.506	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.233	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.826	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.496	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.215	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.375	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.970	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.763	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.383	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.733	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.056	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.022	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.023	Reject the null hypothesis.
182	The distribution of Test is the same across categories of DemoLocalTraveler.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J12: Comparing the perception of Union Status groups within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.068	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.141	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.085	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.659	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.310	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.901	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.365	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.048	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.741	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.057	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.801	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.046	Reject the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.013	Reject the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.042	Reject the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.162	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.804	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.719	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.533	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.102	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.951	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.740	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.274	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.233	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.141	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.349	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.429	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.122	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.789	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.493	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.004	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.118	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.157	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.027	Reject the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.429	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.265	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.263	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.012	Reject the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.625	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.137	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.034	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.286	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.051	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.037	Reject the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.560	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.158	Retain the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.675	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.775	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.808	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.461	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.916	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.549	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.741	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.462	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.449	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.542	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.952	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.321	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.271	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.283	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.418	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.562	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.635	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.620	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.748	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.367	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.577	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.165	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.244	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.377	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.192	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.266	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.232	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.299	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.509	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.479	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.946	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.287	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.515	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.492	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.999	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.614	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.627	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.716	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.932	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.711	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.395	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.703	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.821	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.543	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.005	Reject the null hypothesis.
107	The distribution of E1B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.221	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.454	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.153	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.041	Reject the null hypothesis.
111	The distribution of E2B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.266	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.378	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.281	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.452	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.418	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.414	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.500	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.684	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.534	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.495	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.732	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.301	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.938	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.683	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.840	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.590	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.419	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.786	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.529	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.514	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.838	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.456	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.782	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.840	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.201	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.170	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.562	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.305	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.119	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.160	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.886	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.141	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.068	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.242	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.834	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.042	Reject the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.667	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.278	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.165	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.302	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.017	Reject the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.082	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.033	Reject the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.042	Reject the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.664	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.209	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.162	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.071	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.015	Reject the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.119	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.771	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.033	Reject the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.080	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.808	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.009	Reject the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.217	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.289	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.756	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.027	Reject the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.226	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.067	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.090	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.
182	The distribution of Test is the same across categories of DemoUnionStatus.	Independent-Samples Kruskal-Wallis Test	.024	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J13: Comparing expert panel and field employees in terms of risk units for different mechanical and electrical trades, using Mann Whitney Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.066	Retain the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.598	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.396	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.392	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.686	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.817	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.357	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.008	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.368	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.944	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.740	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.690	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.218	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.749	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.994	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.141	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.193	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.836	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.612	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.350	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.989	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.212	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.298	Retain the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.039	Reject the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.012	Reject the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.214	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.465	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.728	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.095	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.463	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.019	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.006	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.285	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.039	Reject the null hypothesis.
46	The distribution of Married is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.048	Reject the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.159	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.470	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.441	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.311	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.001	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.557	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.030	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.863	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.261	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.835	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.384	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.032	Reject the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.426	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.380	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.868	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.213	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.231	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.190	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.929	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.201	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.153	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.435	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.669	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.289	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.082	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.089	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.264	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.800	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.579	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.169	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.849	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.136	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.189	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.138	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.483	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.353	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.330	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.067	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.355	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.277	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.474	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.540	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.214	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.179	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.144	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.195	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.019	Reject the null hypothesis.
95	The distribution of M9B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.733	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.315	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.647	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.370	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.636	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.225	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.142	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.565	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.479	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.841	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.430	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.936	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.578	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.578	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.750	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.871	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.812	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.753	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.582	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.632	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.270	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.340	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.529	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.523	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.303	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.294	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.232	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.079	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.044	Reject the null hypothesis.
125	The distribution of E5D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.101	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.266	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.210	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.115	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.019	Reject the null hypothesis.
130	The distribution of E7A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.181	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.069	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.028	Reject the null hypothesis.
133	The distribution of E7D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.176	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.113	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.027	Reject the null hypothesis.
136	The distribution of E8C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.082	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.125	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.306	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.479	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.575	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.018	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.690	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.428	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.059	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.054	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.434	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.430	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.228	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.073	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.035	Reject the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.543	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.100	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.047	Reject the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.224	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.316	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.202	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.124	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.751	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.190	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.861	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.368	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.281	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.395	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.087	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.629	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.465	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.135	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.164	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.798	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.968	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.269	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.359	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.731	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.807	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.413	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.514	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.458	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.135	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.126	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoHadInjury.	Independent-Samples Kruskal-Wallis Test	.098	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Appendix J14: Comparing the perception of groups oserving or not observing injuries within each of personal sub-factors, risk scenarios, hazard identification score, and safety knowledge test using Kruskal Wallis Test

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
12	The distribution of MoreThanOneJob is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.028	Reject the null hypothesis.
13	The distribution of ExperiencedInjuries is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.321	Retain the null hypothesis.
14	The distribution of ObservedInjuries is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.233	Retain the null hypothesis.
15	The distribution of FormalTraining is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.180	Retain the null hypothesis.
16	The distribution of JobSecurity is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.223	Retain the null hypothesis.
17	The distribution of LocalTraveler is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.901	Retain the null hypothesis.
18	The distribution of LaborUnion is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.267	Retain the null hypothesis.
19	The distribution of JobLevel is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
20	The distribution of Age1819 is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.
21	The distribution of Age2024 is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.813	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
22	The distribution of Age2534 is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.734	Retain the null hypothesis.
23	The distribution of Age3544 is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.633	Retain the null hypothesis.
24	The distribution of Age4554 is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.189	Retain the null hypothesis.
25	The distribution of Age5564 is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.834	Retain the null hypothesis.
26	The distribution of Age65Over is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.990	Retain the null hypothesis.
27	The distribution of LengthLessThan3Months is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.851	Retain the null hypothesis.
28	The distribution of Length3To11Months is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.800	Retain the null hypothesis.
29	The distribution of Length1To5Years is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.174	Retain the null hypothesis.
30	The distribution of LengthMoreThan5Years is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.246	Retain the null hypothesis.
31	The distribution of ExpLessThan3Months is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.905	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
32	The distribution of Exp3To11Months is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.922	Retain the null hypothesis.
33	The distribution of Exp1To5Years is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.218	Retain the null hypothesis.
34	The distribution of ExpMoreThan5Years is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.009	Reject the null hypothesis.
35	The distribution of NonFormalEducation is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.068	Retain the null hypothesis.
36	The distribution of EducationElemntarySchool is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.160	Retain the null hypothesis.
37	The distribution of EducationHighSchool is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.325	Retain the null hypothesis.
38	The distribution of HigherEducation is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.660	Retain the null hypothesis.
39	The distribution of University is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.626	Retain the null hypothesis.
40	The distribution of LevelApprentice is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.129	Retain the null hypothesis.
41	The distribution of LevelJourneyman is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.668	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
42	The distribution of LevelFormanLead is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.003	Reject the null hypothesis.
43	The distribution of LevelSupervisor is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.002	Reject the null hypothesis.
44	The distribution of GenderMale is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.890	Retain the null hypothesis.
45	The distribution of GenderFemale is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.164	Retain the null hypothesis.
46	The distribution of Married is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.097	Retain the null hypothesis.
47	The distribution of NotMarried is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.065	Retain the null hypothesis.
48	The distribution of NoDependent is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.079	Retain the null hypothesis.
49	The distribution of HaveDependent is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.391	Retain the null hypothesis.
50	The distribution of OneJob is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.193	Retain the null hypothesis.
51	The distribution of MultiJob is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.554	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
52	The distribution of HadInjury is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.710	Retain the null hypothesis.
53	The distribution of NoInjury is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.017	Reject the null hypothesis.
54	The distribution of ObservedInjury is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.774	Retain the null hypothesis.
55	The distribution of DidNotObservedInjury is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.358	Retain the null hypothesis.
56	The distribution of WithJobSecurity is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.508	Retain the null hypothesis.
57	The distribution of NoJobSecurity is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.545	Retain the null hypothesis.
58	The distribution of Local is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.009	Reject the null hypothesis.
59	The distribution of Traveller is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.763	Retain the null hypothesis.
60	The distribution of Union is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.939	Retain the null hypothesis.
61	The distribution of NonUnion is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.881	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
62	The distribution of M1A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.427	Retain the null hypothesis.
63	The distribution of M1B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.427	Retain the null hypothesis.
64	The distribution of M1C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.223	Retain the null hypothesis.
65	The distribution of M1D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.610	Retain the null hypothesis.
66	The distribution of M2A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.622	Retain the null hypothesis.
67	The distribution of M2B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.433	Retain the null hypothesis.
68	The distribution of M2C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.399	Retain the null hypothesis.
69	The distribution of M2D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.931	Retain the null hypothesis.
70	The distribution of M3A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.409	Retain the null hypothesis.
71	The distribution of M3B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.145	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
72	The distribution of M3C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.133	Retain the null hypothesis.
73	The distribution of M3D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.144	Retain the null hypothesis.
74	The distribution of M4A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.805	Retain the null hypothesis.
75	The distribution of M4B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.634	Retain the null hypothesis.
76	The distribution of M4C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.398	Retain the null hypothesis.
77	The distribution of M4D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.634	Retain the null hypothesis.
78	The distribution of M5A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.350	Retain the null hypothesis.
79	The distribution of M5B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.482	Retain the null hypothesis.
80	The distribution of M5C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.265	Retain the null hypothesis.
81	The distribution of M5D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.182	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
82	The distribution of M6A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.868	Retain the null hypothesis.
83	The distribution of M6B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.610	Retain the null hypothesis.
84	The distribution of M6C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.682	Retain the null hypothesis.
85	The distribution of M6D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.403	Retain the null hypothesis.
86	The distribution of M7A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.362	Retain the null hypothesis.
87	The distribution of M7B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.402	Retain the null hypothesis.
88	The distribution of M7C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.456	Retain the null hypothesis.
89	The distribution of M7D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.558	Retain the null hypothesis.
90	The distribution of M8A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.951	Retain the null hypothesis.
91	The distribution of M8B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.195	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
92	The distribution of M8C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.302	Retain the null hypothesis.
93	The distribution of M8D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.297	Retain the null hypothesis.
94	The distribution of M9A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.998	Retain the null hypothesis.
95	The distribution of M9B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.701	Retain the null hypothesis.
96	The distribution of M9C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.842	Retain the null hypothesis.
97	The distribution of M9D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.389	Retain the null hypothesis.
98	The distribution of M10A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.945	Retain the null hypothesis.
99	The distribution of M10B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.652	Retain the null hypothesis.
100	The distribution of M10C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.987	Retain the null hypothesis.
101	The distribution of M10D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.392	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
102	The distribution of M11A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.703	Retain the null hypothesis.
103	The distribution of M11B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.657	Retain the null hypothesis.
104	The distribution of M11C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.684	Retain the null hypothesis.
105	The distribution of M11D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.395	Retain the null hypothesis.
106	The distribution of E1A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.083	Retain the null hypothesis.
107	The distribution of E1B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.263	Retain the null hypothesis.
108	The distribution of E1C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
109	The distribution of E1D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.356	Retain the null hypothesis.
110	The distribution of E2A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.086	Retain the null hypothesis.
111	The distribution of E2B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.179	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
112	The distribution of E2C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.694	Retain the null hypothesis.
113	The distribution of E2D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.472	Retain the null hypothesis.
114	The distribution of E3A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.514	Retain the null hypothesis.
115	The distribution of E3B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.234	Retain the null hypothesis.
116	The distribution of E3C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.360	Retain the null hypothesis.
117	The distribution of E3D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.171	Retain the null hypothesis.
118	The distribution of E4A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.328	Retain the null hypothesis.
119	The distribution of E4B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.390	Retain the null hypothesis.
120	The distribution of E4C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.844	Retain the null hypothesis.
121	The distribution of E4D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.688	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
122	The distribution of E5A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.692	Retain the null hypothesis.
123	The distribution of E5B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.289	Retain the null hypothesis.
124	The distribution of E5C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.689	Retain the null hypothesis.
125	The distribution of E5D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.763	Retain the null hypothesis.
126	The distribution of E6A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.644	Retain the null hypothesis.
127	The distribution of E6B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.475	Retain the null hypothesis.
128	The distribution of E6C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.648	Retain the null hypothesis.
129	The distribution of E6D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.688	Retain the null hypothesis.
130	The distribution of E7A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.602	Retain the null hypothesis.
131	The distribution of E7B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.431	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
132	The distribution of E7C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.379	Retain the null hypothesis.
133	The distribution of E7D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.
134	The distribution of E8A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.554	Retain the null hypothesis.
135	The distribution of E8B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.431	Retain the null hypothesis.
136	The distribution of E8C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.793	Retain the null hypothesis.
137	The distribution of E8D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.349	Retain the null hypothesis.
138	The distribution of E9A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.845	Retain the null hypothesis.
139	The distribution of E9B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.434	Retain the null hypothesis.
140	The distribution of E9C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.550	Retain the null hypothesis.
141	The distribution of E9D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
142	The distribution of E10A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.791	Retain the null hypothesis.
143	The distribution of E10B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.393	Retain the null hypothesis.
144	The distribution of E10C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.220	Retain the null hypothesis.
145	The distribution of E10D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.578	Retain the null hypothesis.
146	The distribution of E11A is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.897	Retain the null hypothesis.
147	The distribution of E11B is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.359	Retain the null hypothesis.
148	The distribution of E11C is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.286	Retain the null hypothesis.
149	The distribution of E11D is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.636	Retain the null hypothesis.
150	The distribution of ONEHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.062	Retain the null hypothesis.
151	The distribution of ONEBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.707	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
152	The distribution of ONEGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.725	Retain the null hypothesis.
153	The distribution of ONETOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.085	Retain the null hypothesis.
154	The distribution of TWOHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.587	Retain the null hypothesis.
155	The distribution of TWOBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.965	Retain the null hypothesis.
156	The distribution of TWOGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.773	Retain the null hypothesis.
157	The distribution of TWOTOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.345	Retain the null hypothesis.
158	The distribution of THREEHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.212	Retain the null hypothesis.
159	The distribution of THREEBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.902	Retain the null hypothesis.
160	The distribution of THREEGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.773	Retain the null hypothesis.
161	The distribution of THREETOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.348	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
162	The distribution of FOURHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.674	Retain the null hypothesis.
163	The distribution of FOURBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.402	Retain the null hypothesis.
164	The distribution of FOURGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.418	Retain the null hypothesis.
165	The distribution of FOURTOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.304	Retain the null hypothesis.
166	The distribution of FIVEHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.492	Retain the null hypothesis.
167	The distribution of FIVEBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.811	Retain the null hypothesis.
168	The distribution of FIVEGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.063	Retain the null hypothesis.
169	The distribution of FIVETOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.210	Retain the null hypothesis.
170	The distribution of SIXHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.456	Retain the null hypothesis.
171	The distribution of SIXBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.329	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
172	The distribution of SIXGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.995	Retain the null hypothesis.
173	The distribution of SIXTOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.200	Retain the null hypothesis.
174	The distribution of SEVENHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.142	Retain the null hypothesis.
175	The distribution of SEVENBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.947	Retain the null hypothesis.
176	The distribution of SEVENGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.364	Retain the null hypothesis.
177	The distribution of SEVENTOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.264	Retain the null hypothesis.
178	The distribution of EIGHTHP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.834	Retain the null hypothesis.
179	The distribution of EIGHTBP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.229	Retain the null hypothesis.
180	The distribution of EIGHTGP is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.035	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
181	The distribution of EIGHTTOTAL is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.128	Retain the null hypothesis.
182	The distribution of Test is the same across categories of DemoObservedInjury.	Independent-Samples Kruskal-Wallis Test	.092	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.