PREVENTING AND REDUCING INJURIES WITHIN

THE CITY OF FAIRFIELD FIRE DEPARTMNET

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CERTIFICATION STATEMENT

I hereby certify that the following statements are true:

1. This paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

2. I have affirmed the use of proper spelling and grammar in this document by using the spell and grammar check functions of a word processing software program and correcting the errors as suggested by the program.

Signed: _____

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ABSTRACT

The City of Fairfield Fire Department has experienced a large number of firefighter injuries. Over a five year study period, firefighters had sustained 33 injuries. Like many suburban fire departments, the City of Fairfield operates with a staffing level that has difficulty absorbing the loss of firefighters on injury leave while also taxing the city financially.

The problem this study will address is the increasing number of firefighter injuries within this organization. The purpose of this study is to identify and describe a plan to prevent and reduce the frequency of injuries.

The paper used and evaluative research method to answer the following questions:

- What are the most common types of injuries that are experienced?
- How/When did these injuries occur?
- What is the cost associated with these injuries?
- How does the City of Fairfield Fire Department compare to fire departments of similar size and structure in regards to injury rates?

Upon review of injury records and internal surveying, the findings revealed that the most common injuries to Fairfield firefighters are occurring on EMS scenes. These injuries are most often to the extremities caused by lifting or falling and happen to those aged 31 to 35 most frequent. Data analysis revealed the average workers compensation cost to be in excess of $27,000 annually to the department.

External surveying concluded that the City of Fairfield Fire Department is very similar in injury rate, type, frequency and cost as that of comparable departments.

Based on research and findings, recommendations to prevent and reduce these injuries were:

- Adopt and adhere to NFPA 1583.
- Creation of an injury incident database for trending / prevention training.
- Conduct training over lifting techniques, core strength, and functional movement.
- Implement HFACS and CRM tools into accident committee for method of injury evaluation.

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INTRODUCTION

Statement of the Problem

Firefighter injuries are all too common amongst the fire service industry. Injuries are so common that they have become an almost accepted and/or expected occurrence as part of the delivery of fire service duties. Fire Fighting is a dangerous occupation and with that danger comes a degree of risk. With this risk however, are injuries preventable?

The City of Fairfield Fire Department was not alone when it came to the number of firefighters injured. Over the past several years, the Fairfield Fire Department had seen an increase in the number of injuries to its members. As call volume had increased and staffing levels remained the same, more and more injuries were occurring. The affect of the injuries were impacting many areas within the department.

Injuries were causing a strain on department operations. With the current minimum/maximum staffing levels, level of service and safety was potentially affected due to absence of firefighters on injury leave.

The City of Fairfield Fire Department, like many smaller combination departments, operates in such a way that missing just one firefighter from the staffing level creates a void that is difficult to absorb. The difference between operating with three firefighters on a first arriving engine and an engine with only two firefighters is often the result from a firefighter on injury leave. Studies have shown the effectiveness of three person crews versus two person crews of first arriving suppression companies to have a severe impact on the safety and overall result of the incident to the negative.

Firefighters on injury leave create more work and even lower morale for those

firefighters that are left to operate as normal with less assistance.

The city is affected by having to incur the financial burden of paying overtime to fill the absence of the injured firefighter when staffing level drops below minimum, while also paying the injured employee off on medical leave. The city is responsible for the employee's full salary being paid for up to one year (minus the difference of workers compensation payment) due to a recuperative leave clause in the current labor contract that the firefighter's union has in place. In addition to employee pay, the city is also paying the increase in pension contributions due to the rising salaries of employees covering those that are injured.

Injured firefighters also face the physical pain and mental stress that occur with certain types of injuries. Often away from work for months at a time, the skill set and proficiency of work may also be lessened.

The problem this study will address is the increasing number of injuries experienced by firefighters within the City of Fairfield Fire Department.

Purpose of the Study

The purpose of this study is to identify and describe a plan to prevent and reduce the frequency of firefighter injuries. The results of this study will be submitted to fire department administration for possible implementation to improve safety within department operations.

Research Questions

The following questions will be answered by using an evaluative research method:

1. What are the most common types of injuries that are experienced?
2. How/When did these injuries occur?
3. What is the cost associated with these injuries?

4. How does the City of Fairfield Fire Department compare to fire departments of similar size and structure in regards to injury rates?

BACKGROUND AND SIGNIFICANCE

The City of Fairfield Fire Department was founded in 1955 as an all volunteer operation. The department progressed in 1984 by hiring its first full time fire chief and moved to a part time paid service covering daytime shifts continuing with volunteer operation for night time coverage. In 1993, three full-time fire captains were hired to serve as shift unit day commanders and part time staffing was increased to provide 24 hour coverage eliminating all volunteer positions. In 1999 the city hired its first group of career firefighters and transitioned to a combination career / part-time department. The city continued to hire career firefighters gradually increasing the number to 27 by 2003. The fire department provides service to the community of 43,000 through three strategically placed firehouses covering 21 square miles. The fire department staffs these firehouses with a maximum of 15 firefighters. The department's minimum staffing level is 12 personnel. The firefighters are allocated as five maximum / four minimum per firehouse. The fire department also staffs a career fire captain that serves as a unit day battalion chief acting as the incident commander on all larger scale incidents who is not factored into the maximum/minimum staffing levels.

The department employs a total staff of 63 personnel: 31 full time employees (two chief officers, three captains, six lieutenants, 18 firefighter paramedics and two administrative secretaries) and 32 part time employees (CFFD personnel roster 2009).

The department responded to over 7000 calls for fire, rescue and emergency medical incidents in 2008 (CFFD run data 2008). The department operates three ALS transport ambulances, and three fire suppression vehicles (two quints, one engine), one each at all of its fire stations. At maximum staffing, three personnel are assigned to a suppression unit, and two

personnel are assigned to a transport unit. At minimum staffing, the suppression unit is staffed by two personnel.

The City of Fairfield Fire Department has experienced a large increase in the number of injuries to firefighters over the past several years. Over a five year time period (5/2004-5/2009), the department has had 33 injuries to its members (City of Fairfield HR records). Utilizing these figures an average of more than six firefighters are injured annually, or more than one every other month. Injuries ranged in severity from minor cuts and scrapes to major knee and back injuries requiring extensive surgery and prolonged leaves of absence for the recovery and rehabilitation period. Injuries were occurring on fire and EMS scenes, during training, responding to incidents and even within the firehouse itself.

The department has always taken the safety and conditioning of its members as a top priority of operation. In 2002, an annual SCBA (self contained breathing apparatus) endurance drill was developed by the training division to monitor and establish a benchmark for the conditioning and performance of its members. The drill is a station based obstacle course, requiring physical effort to complete simulated firefighting tasks. This drill was developed to give the firefighters an idea as to the amount of work that they could execute while wearing their personnel protective gear including SCBA. It also served as a monitoring tool for the administration to review the physical performance of all firefighters. Those that performed under the established benchmarks, were counseled and put on a physical improvement plan by supervisors to bring their performance and conditioning up to the minimal level.

As a result of physical conditioning measurements from the SCBA endurance drill, in 2005, the department implemented the IAFF – Wellness / Fitness Initiative program through contract negotiations with the city administration. While also incorporating at this time, annual

physical evaluations by a medical doctor for a more complete profile and fit for duty certification. The agreement is a non-punitive program that allows firefighters to work out for one hour on duty while the city agrees to provide proper equipment and time to exercise. The administration sees this as such a priority that units are removed from service frequently to provide time for exercise.

Through all of the attempts to physically prepare firefighters to do the course of their job, injuries were still occurring. The amount of injuries had possibly been decreased, but no known correlation had been established. Preventative measures had been implemented post injury on any occurrence that was found to be preventable. Reducing the frequency of injuries will improve the operations of the department both financially and in the amount of staffing that is available to manage the run volume, even possibly reducing future occurrences of injury due to more personnel alone.

Results from this study may produce patterns or reasoning for injury occurrence. When and how they occur most may be identified to train personnel on risk assessment and situational awareness to make firefighters cognizant that they are operating in an injury prone situation. Common equipment may be identified as a cause of injury, creating a need to investigate alternative options that are available.

Is the department's rate of injury "normal" for its size and run volume compared to similar organizations?

Using research from this project, fire department administration could utilize the results and implement preventative and reduction methods prior to injury occurrence.

The potential impact this study could have on the Fairfield Fire Department is a reduction of injury incidents, while also creating an environment that strives for no injuries to occur.

LITERATURE REVIEW

NFPA 1500 *Standard on Fire Department Occupational and Health Program* (2007) is the standard at which all fire departments compare and measure their own organization to in regards to safe operations. This standard is considered "the golden standard" due the importance of the subject that it covers. Within this standard, section 4.10 Accident Prevention, the framework is laid out for the prevention of injuries from occurring. Detailed course of action is defined and directed to set policy in place by the department for the safety of firefighters. It is due to this standard that much research and attention is paid to accident prevention.

After the development of NFPA 1500, the technical committee felt that an additional document was necessary to create in regards to firefighter fitness. NFPA 1583 *Standard on Health-Related Fitness Program for Firefighters (2000, 2008)* was drafted and approved as the recommendation for fire departments to follow. NFPA 1583 establishes the benchmark for fitness requirements and provides direction for implementation of a department health and fitness program. This document specifies the creation of a health-fitness coordinator (HFC) to implement, monitor, and document the condition of firefighters and liaison those findings between a department physician and administration. NFPA 1583 also recommends exactly which areas of fitness firefighters should focus and provides outline for workout routines and minimums that should be met. This committee stated that overweight, out-of-shape firefighters are an accident waiting to happen. They also believe that a health-related fitness program will contribute significantly to reducing firefighter fatalities and injuries.

A report issued by the U.S. Fire Administration, Fire-Related Firefighter Injuries in 2004, (2008), most firefighter injuries occur on the fire ground, more specifically one and two family

residential construction. According to this report, “Eighty-nine percent of firefighter injuries reported to NFIRS in 2004 are associated with structure fires. Of the injuries associated with structure fires, three-quarters (76 percent) occur on residential properties. Overall, structure fires on residential properties account for 68 percent of firefighter injuries.” (USFA, 2008). The severity of the injuries reported showed that a majority of the injuries were minor (52%) and required no loss from work time. The report however showed that approximately 30% of injuries did require a loss of time from work for the injured firefighter. The largest age bracket that firefighters were injured was shown to be between 30 and 39 years of age. The most common injury type was found to be the upper and lower extremities. While this report is detailed in nature, it does not account for injuries that were not reported.

TriData (2004) produced a study on the overall cost of firefighting injuries. It was estimated that the total cost of injuries and prevention to fall between 2.7 and 7.4 billion dollars per year. The study created a scale on the degree of injury type (maximum abbreviated injury scale – MAIS). The scale ranges from MAIS-0, less than minor, to MAIS-6, fatal. The range of cost increases exponentially with each increase in severity. Utilizing this injury scale will produce an estimated overall cost of injury per occurrence based on research and past injuries. The study also produced solutions for decreasing the amount of injuries sustained. This report cited that prevention and education of the public to reduce the call frequency would thus decrease injury numbers alone via less run volume. It also cites that firefighter attitude, training and physical fitness need improvement for a change to occur.

The National Firefighter Near Miss Reporting System, 2008 Annual Report identifies two areas of specific interest when it comes to injury prevention and reduction. The report uses two evaluative analysis tools to look at near-miss accidents and identify areas for improvement or

intervention. The tools used by the committee to evaluate reports are Crew Resource Management (CRM) and Human Factors and Analysis Classification Systems (HFACS). CRM includes five key points – communication, decision making, situational awareness, task allocation and teamwork. The HFACS analysis tool evaluates an event based on individual and organizational performance: unsafe acts; preconditions to unsafe acts; unsafe supervision and organizational influences. By analyzing past accidents and near accidents, strategies and recommendations for change can be made to reduce or prevent injuries.

Williford & Scarff- Olson (1998) found that fitness level and added body fat had a direct relation to the performance of firefighters completing physical tasks. “The study results demonstrated what had been previously shown with different groups of athletes. Excess fat in terms of additional weight increases the energy cost of activity. A direct negative relationship was found between added weight and decreased performance. The greater the additional weight the person had to carry, the less efficient the person was in performing the aerobic or anaerobic activity. When extra weight is carried, the person is at an obvious disadvantage when performing prolonged strenuous weight-bearing physical activity. The added weight decreases performance and causes fatigue to occur at a faster rate. Carrying additional weight or fat produces an increase in exercise heart rate and blood pressure, a decrease in muscular endurance, an increase in cardiac demand, and a decrease in metabolic efficiency. In addition, the extra weight can increase the potential for musculoskeletal injury.” As a result of the body fat study and it’s relation to performance and injury, the Montgomery (AL) Fire Department implemented a mandatory physical fitness standard. Firefighters are screened monthly using height and weight standards based on age and sex. If the firefighter is not within the accepted ratio, they are given a time constraint in which they will meet the standard.

Peate, Bates, Lunda, Francis, & Ballamy (2007) through the University of Arizona, conducted a study among 433 Tucson firefighters that measured core strength as a precursor for injury prediction and prevention. The firefighters were given a functional movement screen (FMS) test that included measurements in lifting technique and core involvement. The authors understood that firefighting as an occupation does not always provide opportunity to insure that you are lifting correctly under the conditions that firefighters face daily. The FMS test was developed to measure the test group's core stability while conducting a series of exercises that included: hurdle step, in-lunge movement, shoulder mobility, stability push-ups, deep squat and active leg raise. The firefighters were given a FMS score after completing the series of tests with no instructions. The subjects were then enrolled in a training program that taught functional movement, body mechanics, injury prone situation recognition, and core strength involvement. For one year following training, information on injury type and lost work time was gathered and compared to the year previous. Injury rates were found to have been reduced 62% by the firefighters that participated in the intervention and 44% overall within the Tucson Fire Department.

Kim, Hayden & Mior (2004) conducted a case study measuring the cost effectiveness of a back education program for firefighters. The study was conducted by a practicing chiropractor involving 92 firefighters from a suburb fire department of Toronto, Canada. The chiropractor taught a course to the firefighters called the "Back Informed Program", developed at the Canadian Memorial Chiropractic College. Firefighters were educated on the epidemiology of low back pain, anatomy and biomechanics, principles of back safety, correct lifting and handling techniques, correct posture, nutrition, exercises, and pain management. Prior to the study conducted, lost days from work due to low back pain were measured. After course completion,

the numbers of days lost from work due to low back pain were reduced by 72.4% for the following two years measured. The estimated cost of the program was $5000.00 for implementation. The city HR department estimated the cost savings due to reduction in absenteeism to be approximately $60,000.00.

In an article written for Fire Rescue News, Dave Murphy, 2008, identified 12 ways to reduce firefighter injuries based on identifiable factors that were found in a detailed analysis of line-of-duty injuries conducted by the IAFF. According to Murphy (2008), “more that 94 percent of the injuries were attributable to an identifiable cluster of contributing factors.” Utilizing these factors, Murphy (2008), estimates that a 30 percent reduction in firefighter injuries can be prevented by changes in behavior alone. The behaviors that were recommended to reduce injuries were: leave the ego at home; always consider risk versus gain; mandate higher education as a requirement for promotion; provide inter-agency training on a regular basis; maintain well written SOP’s and SOG’s; provide frequent, realistic and modernized training; enforce established safety-related rules; budget for full annual physicals; complete annual individual performance fitness qualifications with corrective action; require cessation of tobacco usage as a prerequisite of hiring; exhibit a willingness to change outdated practices and tradition; and adopt what is working among other departments.

The literature review identified a variety of approaches that proved effective in injury reduction and prevention techniques. Education, training, identification of hazard, and fitness level were all found highly relevant to reduce the frequency of occurrence. The most common topic found among literature review sources was found to focus on firefighter fitness level before injury. Prevention of injury in many instances was directly related to the physical fitness level of

the firefighter to begin with. While the risk of injury to all firefighters is always present, the identification of those that are more likely to be injured is often present prior to occurrence.

PROCEDURES

The desired outcome of this research project was to identify means in which to prevent and reduce the injury rate within the City of Fairfield Fire Department. The research project started with the conduction of a literature review. These sources were obtained through numerous online documents and publications found on the subject, as well as previously written research papers found through the Learning Resource Center of the National Fire Academy. Additional information was also obtained through the City of Fairfield human resource and finance departments as well as information provided to them by Sheakley Unicomp, the city's worker compensation case management firm.

Two surveys were created to assist in answering the research questions proposed. Both surveys were pilot tested with two fire department officers prior to dissemination. Survey Monkey, an online web based survey tool was utilized for design and data collection of both instruments. The author then collected and analyzed the data of the responses.

Survey one was distributed via email to fire chiefs of departments that were found similar in operation and/or size to the City of Fairfield Fire Department. These departments were identified as such through the Southwest Ohio, Southeast Indiana, Northern Kentucky Fire and EMS Asset Inventory and the International City Managers Association (ICMA) study that the City of Fairfield participated in 2009. The total number of this survey distributed was 90 with a return total of 18 for a 20% rate of return. The focus of survey one was to identify injury type, location and method of occurrence, number of firefighters injured per year, and cost to their organization for comparison to the CFFD. The survey also assessed for contributing factors prior

to injury occurrence and reduction/prevention measures that others have implemented to measure effectiveness and consideration.

Survey two was distributed to all members of the City of Fairfield Fire Department. This survey was sent via department e-mail. The total number of surveys distributed was 63, with 38 firefighters completing for a 65% rate of return. The focus of this survey was to identify those firefighters that have been injured and gain valuable information as to how, where, and factors that contributed to their injury before it had occurred. The survey also gained data from firefighters that had not been injured while on-duty and solicited information in regards to where the feel that they could be injured and identified factors that would improve their chance of becoming injured.

Injury data was also obtained from the City of Fairfield Human Resource Department that measured firefighter injury type, body part injured, age of firefighters, as well as method of injury. Workers comp claim and cost information was also obtained through the HR department provided by Shakley Unicomp.

Definition of Terms

Combination Department. The staffing of firefighters at a fire department that are both full-time employees and part-time or volunteer employees.

Suppression. Firefighters that are assigned to and involved with extinguishment of a fire.

ALS. Advanced Life Support

EMS. Emergency Medical Service

SCBA. Self Contained Breathing Apparatus, the air pack that firefighters wear to breathe during a fire or low level oxygen environment.

IAFF. – International Association of Fire Fighters, the union that represents career firefighters.

Core Strength. – The strength of the abdominal and lower back muscles.

Limitations of the Study

1. All injuries sustained by firefighters are not always reported. Thereby making it difficult to track specific type, location, method of all injuries.
2. Multiple injury occurrences to one firefighter and reoccurring injuries are reported as new records and possibly compound the data in one specific area.
3. No injury database is linked between Fire Department and HR to easily track information about the subject.
4. Firefighters that sustain an injury off duty and then report the injury as happening on shift could severely impact the data collected.
5. Cost data collection was limited to workers compensation claims due to the inability to distinguish the reason firefighters are off duty in department and finance records.

RESULTS

Information to answer the research questions was gathered by internal and external department surveys, as well as data obtained through the City of Fairfield HR department. Research question number one, what are the most common types of injuries that are experienced? The research revealed that over a five year time period that 33 firefighters were injured while on duty with extremity injuries as the most common type (Appendix 1). Of the firefighters surveyed, 26% stated that they had sustained an injury that required at least one shift off duty. Of those injured, 60% considered their injury preventable while the most common age of injured firefighter was found to have been between 31 and 35 years old (Appendix 1).

Question two, how/when did injuries occur? The most common location of injury occurrence reported via HR records was found to have been on the EMS scene (Appendix 2). While the results indicated the EMS scene as most frequent, fire scenes, training, and even in the fire station were not far behind. The most common method of injury revealed was falls and slips with lifting and pulling as the second most frequent method (Appendix 2). Firefighters surveyed indicated the EMS scene as the location where they feel they are most likely to be injured while 44% also indicated that they had knowingly risked injury when the risk could have been reduced.

Question three, what is the cost associated with these injuries? Workers compensation claims for the five year time frame totaled $138,575 for the fire department alone. This figure averages the annual worker's compensation cost to the city at $27,716 per year.

Question four, how does the City of Fairfield Fire Department (CFFD) compare to fire departments of similar size and structure in regards to injury rates? The external department survey revealed that the CFFD is very similar in injury rate, type, method and cost as that of

comparable departments. Of the departments surveyed, 83% reported that they incurred less than ten injuries per year to its members. The CFFD averages 6.6 injuries on an annual basis. Lifting and pulling was identified as the most frequent method of injury, while injuries to the back were reported as the most common type. The overall cost for injuries were estimated to be less than $25,000 by 83% of respondents. This survey, completed by fire chiefs, indicated that 61% felt that increasing firefighter fitness levels would have the greatest impact on reducing injuries within their own organizations.

DISCUSSION

After analyzing the comparative data, firefighters at the City of Fairfield fall right in line with others in regard to injury rate, type and method of injury as do a majority of firefighters throughout the nation. According to the USFA Fire-Related Firefighter Injury Report (2004), firefighters that are between 30-39 years of age are the highest percentage of those injured. These findings coincide with those that are injured most at Fairfield. In addition to age as a commonality, extremities being injured by strain/sprain prove to be yet another factor that is similar.

The City of Fairfield operates as a combination department utilizing both career and part-time staff. Annual physicals are conducted for career firefighters only due to the cost associated with testing. Full-time firefighters are also required to participate in the health and wellness program due to contract obligation. However, no preventative or follow up exam is completed for those firefighters that are considered "overweight." Williford & Scharff (1998) state "that added body fat decreases performance and the extra weight can increase the potential for musculoskeletal injury." Presently, being overweight is not considered a factor to deny a fit for duty certification by the contracted doctor who conducts the annual physical evaluations. Exclusion of physical exams for part-time firefighters is a dangerous practice that contradicts Murphy (2008) who states that "budgeting for full annual physicals is perhaps the greatest intervention that could be undertaken by any fire department" to reduce firefighter injuries.

NFPA 1583 (2008) states that fire department's shall establish and maintain a health-related fitness program for its members. The CFFD currently does not adhere to this standard by true definition. While parts of the program are in place, no designated person is operating or

maintaining the requirements of the program. Key elements for success and improvement are lost as a result and injury levels continue to affect the department.

Lifting and pulling injuries continue to be the leading cause for firefighter injuries nationwide according to the USFA. The amount of training the average firefighter receives on lifting techniques is limited to the phrase “lift with your legs, not with your back.” Proven injury reduction numbers have been attributed to education in this area alone. In the core strength study conducted by Peate, Bates, Lunda, Farancis, and Bellamy (2007) at the University of Arizona, a 44% decrease in injury reduction was reported within the Tucson Fire Department after functional movement training. These numbers prove that by educating your membership, injuries can be lessened. Any training to Fairfield firefighters in this area could greatly reduce injuries sustained through lifting.

In the survey completed by Fairfield firefighters, 44% indicated that they had knowingly risked injury when that chance could have been lessened. This mentality can be attributed to firefighter ego and the lack of situational awareness. Murphy (2008), states that simple changes in behavior alone can reduce firefighter injuries by 30%. Teaching firefighters to always consider risk versus gain will prove invaluable to keep one from risking injury when the result is not worth the outcome.

The results from the data have shown specifically who, where, and how a majority of Fairfield’s firefighters are becoming injured. Through implementation of preventative action found through comparison and research, the recommendations will prove effective at reducing the frequency at which injuries occur.

RECOMMENDATIONS

After completing this applied research project, the following are recommendations that the author feels will reduce and prevent injuries within the City of Fairfield Fire Department.

- Adopt and adhere to NFPA 1583 – Standard on Health-Related Fitness Programs for Fire Department Members by department SOP.
    - Mandate full physicals for all fire department members.
    - Create the position of health and fitness coordinator (HFC) to liaison between FD physician and firefighters for individual attention and goal setting.
    - Conduction of periodic fitness reviews by HFC to monitor progress and adherence to the health and wellness program.
- Create and maintain database of firefighter injury incidents.
    - Record specifics on injury type, location, and common equipment involved to trend and prevent future occurrence.
- Conduct mandatory department-wide training over the following:
    - Lifting technique practices utilizing the back informed program.
    - Core strength and functional movement screening with pre and post instruction measurement for comparison.
    - Risk versus reward, situational awareness, and attitude training for firefighters to improve behavioral decisions.
- Implement HFACS and CRM tools within post accident review committee.
    - Post results of findings openly for all firefighters to see and learn from.

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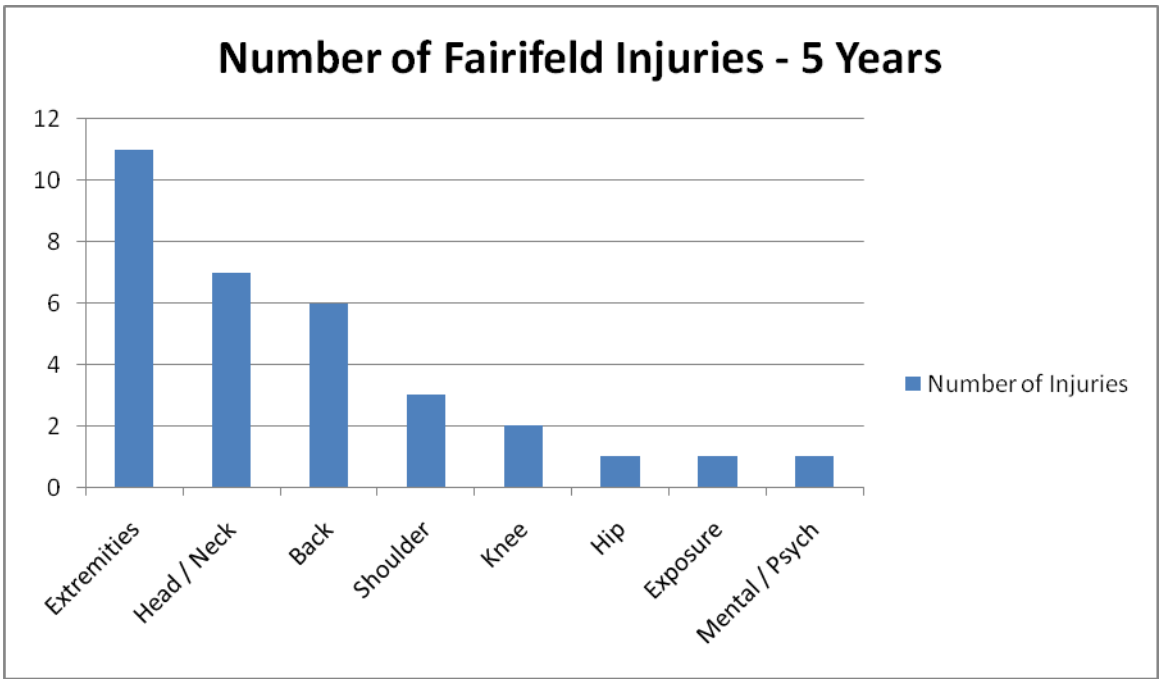
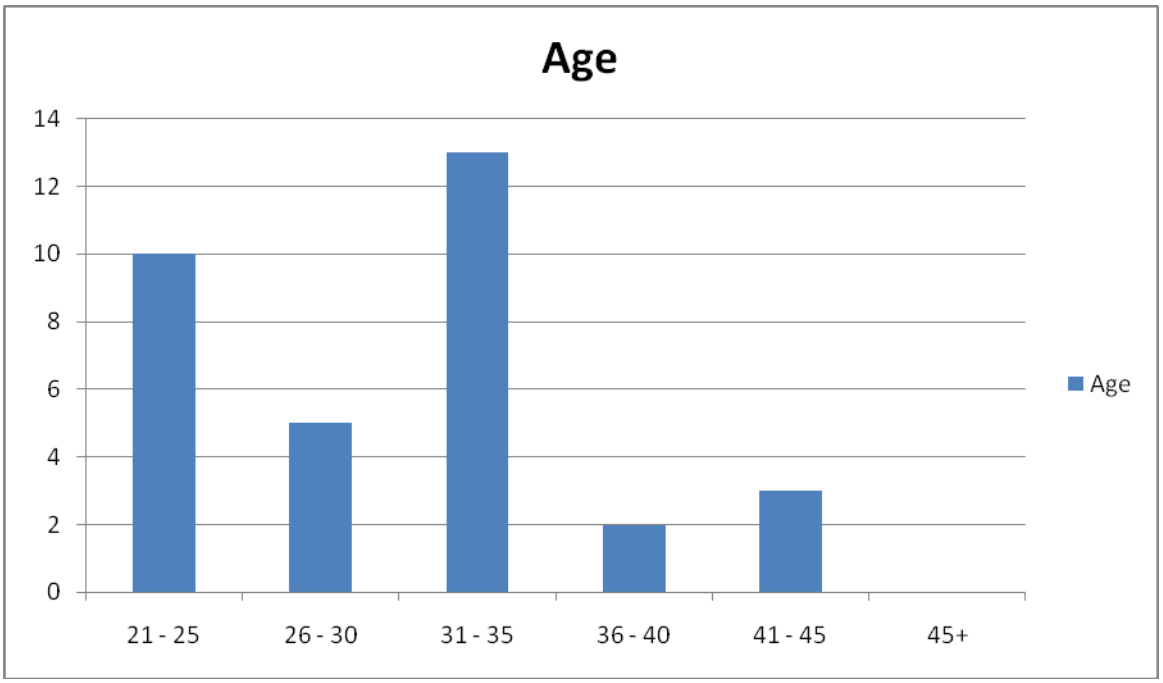
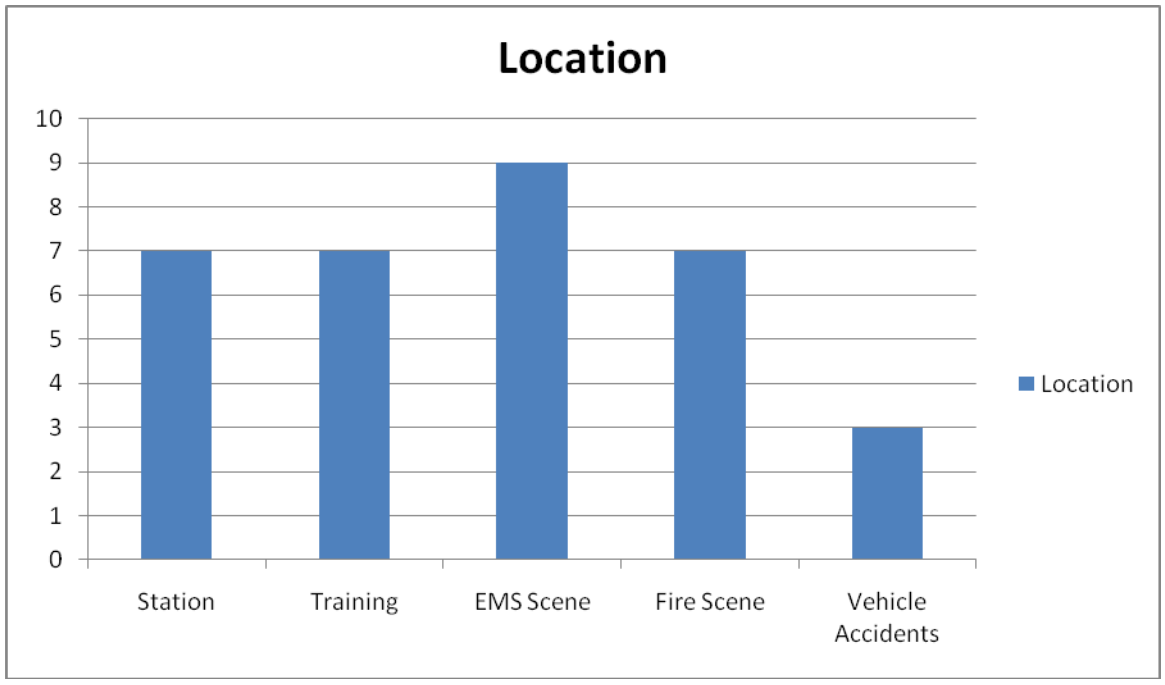
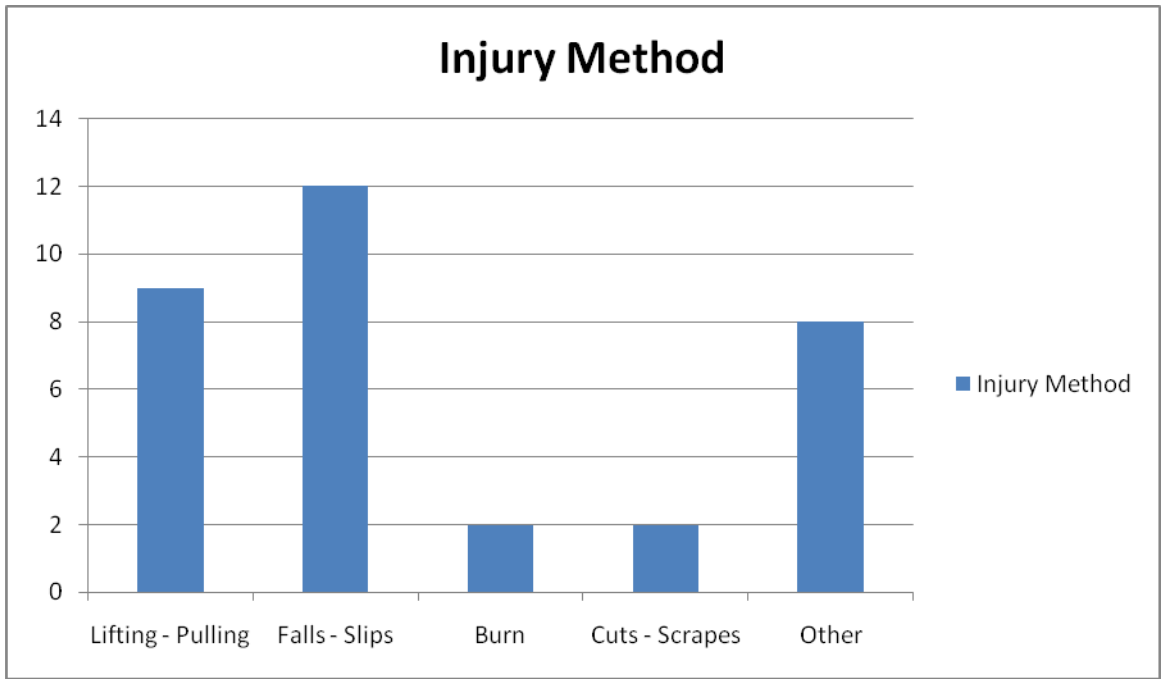
APPENDIX 1 – NUMBER / TYPE OF INJURY & AGE OF INJURED





APPENDIX 2 – LOCATION OF INJURY & METHOD OF INJURY





APPENDIX 3 – INTERNAL / EXTERNAL SURVEYS