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An Injury Incidence Analysis at the Wal-Mart Distribution Center in Mount Crawford, VA
from February 2016 to January 2017

by

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ABSTRACT

An Injury Incidence Analysis at the Wal-Mart Distribution Center in Mount Crawford, VA
from February 2016 to January 2017

Christopher T. Ruzala
Old Dominion University, 2017

The study focused on the correlation of injuries and time in service for workers in labor intensive, repetitive jobs. The population for this study comprised all hourly employees working at the Wal-Mart Distribution Center located in Mount Crawford, VA. In compliance with OSHA requirements, when an employee injury requiring medical attention occurs the data is collected and recorded. These data records were provided by the Safety Manager of the facility. The data was collected from February 2016 through January 2017 to coincide with fiscal year. During this time period there were 685 employees working within the warehouse.

A Chi-square statistical analysis was used on the collected data (February 2016 – January 2017) at a level of significance of 5%. The calculated p-value was <0.0001 , indicating that there is a significant difference in the number of injuries occurring to employees who are employed for less than one year versus employees who are employed for more than a year and performing the same job tasks (28 vs. 6). The data analysis also revealed that the incidence of muscle injuries (41.1%) is larger than other injury types. The incidence of contusions is 20.5%, sprains 14.7%, and cuts, eye injuries or other types 23.5%. The results and conclusions of this study indicate that employees with one year or less of service have a higher accident rate. One consideration to reduce the higher incidence rate of accidents in new employees should focus on the training provided to new employees.

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CHAPTER I

INTRODUCTION

In the United States there are over 841,000 workers who perform repetitive manual labor tasks in the warehousing industry (Blsgov, 2016). A growing number of employers wish to convey to their staff that safety is the number one priority of the workplace. Some employers design and showcase banners to declare their safety record, while others provide clothing to signify a milestone has been achieved or celebrate with a company sponsored meal, all to promote safety awareness. Through whichever channel an employer chooses to focus on safe working behaviors, there is definitely a focus on enforcing safe working behaviors to avoid injuries.

With corporations looking to reduce their operating expenses and increase their productivity rates, where does the cost of safety fall? In addition to the employees' expectations of providing a safe work environment, there is also a savings to the bottom line for organizations in both the measurable amount of dollars spent on medical costs arising from workplace accidents and the harder to realize impact to productivity, quality, and morale of the workforce. If one does not feel the organization has their well-being in consideration, workers are less likely to feel as though they hold value with an organization; lower feeling of value and worth are contributing factors to a decrease in productivity and more importantly in being safety focused at work.

Statement of Problem

Jobs involving manual labor, like the occupations in distribution centers are susceptible to on the job injuries such as muscle strains. The purpose of this study is to determine if first year distribution center employees have a higher frequency rate of muscle strains while working in

labor intensive jobs than employees with longer tenure performing the same duties. This study was undertaken to determine if training for on the job injuries needs to be enhanced.

Research Hypothesis

The following hypotheses guided this study:

H₀: Distribution Center employees who are employed for less than one year have more muscle injuries than employees who are employed for more than a year.

H₁: There is no difference in the number of injuries in Distribution Center employees related to their years of service.

Background and Significance

Wal-Mart's Logistics Division measures the success of an individual warehouse safety plan according to the relation to the OSHA incident rate compared to the industrial average. An OSHA recordable incident can encompass a variety of injuries or accident types. OSHA (1960) identifies "An injury or illness is an abnormal condition or disorder. Injuries include cases such as, but not limited to, a cut, fracture, sprain, or amputation. Illness includes both acute and chronic illnesses, such as, but not limited to, a skin disease, respiratory disorder, or poisoning." (para. 1960.2(1)) As a result of the varying range of injuries and the impact on both, the individual and financial shortcomings, to the organization, a continuous evolvement of programs have been implemented over the years. Financial incentives for individual safety has been removed for fear of the potential non-reporter working through an injury for financial gain rather than reporting an injury and being treated. The latest focus is on creating an atmosphere or safety culture in which the employees are given ownership of ensuring one another's safety.

The latest program is concentrated on team based behavior which focuses on each hourly employee agreeing to embrace the safety culture and police one another to enforce safe work behaviors. Although this form of peer pressure and constant supervision of one another should

ultimately lead to a reduction of workplace injuries, all aspects must be considered and analyzed to improve the welfare of workers.

There should be a fundamental review of the safety training of new employees and the training of the people responsible for training new employees in an organization. Geller (2010) stated “Most people care, but too often, people fail to act on their caring. They seemingly lack the courage to step to the plate to prevent potential harm to another person” (p. 39). Therefore, no matter the safety program in place or embraced by an organization if effective initial training is not implemented then an early employment injury increases in potential. A focus on ensuring trainers are capable and invested in training on safe work behaviors can lead to a decrease in injury rates and an increase in financial savings related to a decrease in accident costs.

Limitations

Workplace injuries can encompass a wide range of harms including soft tissue injuries such as sprains and strains, cuts, burns, debris in the eye, allergic reactions to an unknown contaminant, among others. For the purpose of this study, all injuries which occurred in the warehouse and meet the specifications of being classified as an OSHA recordable accident were captured. Additionally, the data used were only retrieved from one Wal-Mart warehouse, D.C. 7045.

Assumptions

For the purpose of this study, it was assumed that not adhering to ergonomic safe handling techniques would lead to an increase in the injury reporting rate. This assumption was based on the logic that not following the techniques recommend for ergonomic lifting would lead employees to use body mechanics outside the normal operation of their body movements. These movements would contribute to flying like a bird or going outside the green zone of safe lifting.

Furthermore, it was assumed that initial safety training programs could be expanded to provide greater focus to the new employee's understanding of safe work practices.

Procedures

Injury reports from Wal-Mart Distribution Center 7045 were used in this study as the primary data collection points. The injury reports were used to compare the injury frequency of employees with less than one-year service on the job as compared to the injury rate of those with more than one-year tenure performing identical tasks. Statistical analysis using the Chi-square test were made.

Definition of Terms

The following terms used throughout the study are defined for clarity:

OSHA (Occupation Safety and Health Administration) – Division of U.S. Department of Labor.

This department creates, defines, and enforces federal regulations for workplace safety.

D.C. – Distribution Center also referred to as a Warehouse.

Fly like a bird – The act of picking up, moving, or handling merchandise and one's elbows are no longer parallel to their body but rather positioned either perpendicular or angled to their torso placing additional stress on the shoulders and back muscles.

Green zone – The preferred area of safe lifting to prevent over reaching and/or over exerting a muscle(s). This area is defined as the space between the hips and the shoulders and no more than twelve inches away from the chest.

Summary and Overview of Chapters

This study was based on the fact that most injuries are accidents and accidents are defined as “an event that is not planned or intended” (Merriam-webster.com, 2016). Therefore, if

workers are thinking about their actions and planning out their movements following an effective safety training course, they are less likely to engage in an accident. This study sought to show that employees with less than one year of service on the job had a greater injury rate than those with more than one year experience and that greater emphasis needed to be placed on the initial training of safe work practices. The study is limited to one Wal-Mart distribution center located in Mount Crawford, VA consisting of an employee base of 700 employees.

Chapter II will include a review of literature, which contains a summary of previous literature completed in the area of safe working practices and team-based safety cultures.

Chapter III will describe the methods and procedures used to conduct the study and analyze the data. Chapter four will provide the findings of this research. Chapter five will present the conclusion, and recommendations of the research.

CHAPTER II

REVIEW OF LITERATURE

The purpose of this chapter is to review the relevant literature to the problem statement and research hypothesis. The purpose of this study was to determine if first year distribution center employees have a higher frequency rate of muscle strains while working in labor intensive jobs than employees with longer tenure performing the same duties. This study is being undertaken to determine if training for on the job injuries needs to be further enhanced. This chapter contains the following topics: (a) Potential safety hazards to warehouse workers in the material handling industry, (b) Methods of presenting safety training, (c) History and general information about Wal-Mart distribution center 7045 in Mount Crawford, VA., (d) Potential safety-related dangers at the distribution center, (e) Safety training utilized at the distribution center.

Potential Safety Hazards

Safety is a modern-day pulse point and metric used to determine the effectiveness of leadership in a Wal-Mart distribution. Several reasons exist for the requirement of creating a safe work environment: (a) The unwritten expectation between employee and employer to provide a safe and secure work environment which can lead to higher morale, increased productivity, and exceeding quality expectations, (b) Exceeding OSHA standards which equates to a lower risk category of spontaneous inspections and a decreased likelihood of compliance fines, (c) Impact to the profit and loss statement as it relates to the cost of medical services and lost time employee costs. With the rising cost of medical care, not only impacting the American worker, corporations are realizing an impact to their operating budgets as emergency room visits and specialist care for work-related injuries negatively impact the bottom line operating costs.

“Every year workplace injuries, illnesses and deaths cost our nation \$170 billion” (Oshagov, 2016, para. 1). To reduce both the impact and the potential of workplace injuries, the cause and types of the most prevalent injuries had to be identified.

After determining this information, an in-depth analysis of the new hire safety training needed to be analyzed to assess if proper training was being conducted at the appropriate level. The starting point in researching workplace injuries would undoubtedly begin with reviewing data collected by the government agency, OSHA. Their data collections reveal that in America, one out of every five injuries at work are related to the employee's back. One-fourth of all compensation claims from employers are related to back injuries and combines to billions of direct dollars in lost revenue. The overwhelming majority of these back injuries were related to manual material handling (Okstateedu, 2016).

Waehrer (2007) suggests that a proactive approach needs to be applied to ensure a high, effective level of initial training is being focused on prevention, with back injuries being a majority of the reported injuries in the workplace and with the direct cost of treatment and settlements being in the billions of dollars. There are additional tools being used in the warehousing industry that contribute to avoidance tactics to injuries. Some warehouses mandate the use of lower lumbar support belts. According to the National Institute for Occupational Safety and Health, at this time there is not enough scientific data to determine the effectiveness of lower back belts as being a leading cause in preventing back injuries. However, the belts can play a role in perhaps reminding employees to focus on ergonomic lifting techniques (Cdcgov, 2016). Some warehouses have invested in technologies which provide mechanical support to the employees by lifting merchandise to a less strenuous level of lifting bringing the merchandise to around the mid-torso area rather than bringing the employee to the merchandise level. Whereas

the machines have added support in the area of reducing lower body lifting, the question now is could they be contributing to injuries at the workplace caused by operator injury through machine use, or body parts coming in contact with moving machine parts. One of the newer investments being embraced by companies is focusing on effective employee stretching and warm-up exercises prior to commencing the daily duties of the employee, basically preparing your muscles for the work ahead (Middlesworth, 2016). The premise is to prime the body for the work planned ahead.

Safety Training Objectives

All new hired employees should have attended the required safety training course during their new hire on boarding classes. There are three categories of employees that need to be focused: new hires, repeat offenders, and employees new to the workforce. New hires are the group with the highest concern as they are new to their future career with an overwhelming amount of information being provided to them as they first join the team. Along with workplace rules, company regulations, benefit information, and other employer – employee specific information shared, at this time there is also the aspect of new social relations being formed. Within many organizations there is a belief or myth that states the number one priority to remain employed is to focus on being above production standards at any cost. Often times such an emphasis is placed on productivity of an individual that other expectations are lost. Those employees involved in this mindset tend to lose focus on their safe work behaviors in favor of speed, when in fact often times they are weeks ahead of their progression expectations. Therefore, giving up this time to learn how to do the job safely while balancing the steps of how to make quality and productivity goals in a safe manner. According to the Bureau of Labor

Statistics, a study conducted showed 43.7% of the workplace injuries and illnesses involved employees with less than 12 months experience in their job (Blsgov, 2016).

The accident-prone employee or a repeatedly injured employee constitutes a disproportionate amount of work force injuries. Thirty-seven percent of employees who logged an initial claim came back to file a secondary claim, while 78% of employees with an injury experienced a secondary injury (Biomedcentralcom, 2016). “Nearly half (45.5%) of all repeat claims resulted from a different affliction to a different bodily location than the initial claim” (Nihgov, 2016, para. 16). Although each injury needs to be studied to determine the root cause, on the surface one must ask why some employees have a higher personal injury rates than others. Higher personal injury rates can be attributed to a variety of possibilities such as a difference in jobs, tools used, or the safety mindset of the individual, among others.

Employees that are new to the workforce and new to a field in which they have no experience create a dangerous effect. “Risk is particularly elevated among those in the first month on the job, with over three times the risk of a lost-time injury as workers with over a year’s job experience” (Iwhonca, 2016, para. 7). “Younger workers have higher accident rates because they are reckless, green to workplace hazards, and have the dangerous jobs.” In the study by Root (2016) the question “does it go back to their initial training on the job or their feelings of being invincible that allows them to take more risky actions?” is presented to reflect on the causes for injuries in new employees. Whatever the cause is leading to the injury a focus on changing employee behavior and mindset can only transition to a behavior-based safety coaching process when given enough time, energy, and resources from the leaders of an organization (Geller, 2016). In general, it is more cost-efficient for a company to work with a

problem performer to fix a behavior rather than to go through the termination process then the hiring process and integration of new employees.

Employers have a range of preferred methods to train and retrain employees to attempt to teach and reinforce safe work behaviors. According to the Vermont Labor Department (2016), each dollar spent on workplace safety training returns \$3 to \$10 in direct and indirect cost savings to the employer. Some methods used incorporate a video demonstrating safe working tips, other options include a classroom-type teaching session, one-on-one time with a trainer, or some form of learning from a computer-based module of the workplace.

General Information of Walmart Distribution Center

The Mount Crawford Distribution Center was constructed in 2005 and opened for direct store shipments in March 2006. The facility has 1.2 million square feet of storage space. There are more than 17 miles of conveyor belts running throughout the building. With a limited HVAC system, the building has propane to moderately control the cold of the winter months, however the hot summer months are dealt with fans to circulate the hot dry summer air but no air conditioning system is present in the warehouse. There are between 675 and 725 full time hourly employees, depending on seasonal fluctuations, as well as 60 salaried members of management. Although a majority of the workforce is comprised of males, there is a small female population working in the facility making up about 10 – 15% of the workforce. The Distribution Center services 81 Walmart stores, shipping approximately 70 trailers of freight per day. On average 225,000 cases come in and out of the building each day ranging in weight from 1 pound to over 100- pound cases of merchandise. Approximately 50% of those cases come in and leave the building only being touched twice, once when being pulled from a receiving trailer onto a

conveyor, and then the second time when being pulled from a conveyor onto a shipping trailer. The building houses in excess of 100 pieces of power equipment being operated daily. These industrial forklift weigh between 4000 to 8000 pounds depending on the specific model. The building's efficiency goal is to move 125 cases per man-hour worked in the building.

Potential Work Hazards

Working in this environment, with moving machinery, cutting, and powered equipment, has the potential for any type of accident may occur at any moment. Common injuries at the Mount Crawford Distribution Center, have been mainly related to soft tissue injuries such as sprains and strains, however there is the occasional cut, burn, debris in the eye, and the rare occasion of an allergic reaction to an unknown contaminant. Specific jobs require certain PPE (personal protective equipment) gear to help offset the chance of an accident. Anytime an employee is lifting a pallet, machine assisted, over shoulder height, safety glasses are required to be worn by that machine operator. Employees cutting boxes are required to wear Kevlar sleeves which are designed to be cut resistant. Employees who work around chemicals are required to wear gloves, goggles, and aprons. The general guideline is if an employee is unsure of a substance, then they should assume PPE is needed. General warehouse rules state there is to be no open-toed shoes allowed on the warehouse floor, however steel-tipped boots are not required. There are no other required PPE for general warehouse work.

The potentially most dangerous accidents in the warehouse industry are typically those in which some form of power equipment was involved. With the amount and size of forklifts operating in close proximity to pedestrians, the potential for deadly accidents exists. To raise the awareness of new operators, those licensed on equipment less than 90 days are required to wear a safety fluorescent colored vest to remind others to place additional space between themselves

and the equipment. Proper usage of the equipment's horn is expected when working around pedestrians and when entering or exiting blind spots. Furthermore, many forklifts are in the process of being outfitted with a bright blue spot light called a firefly, which is designed to shine 20 feet in front of the lift and is designed to be an additional measure of alerting other employees of the equipment operating in the vicinity.

Learning from mistakes and taking appropriate corrective action is essential to avoid repeating accidents. Therefore, each workplace injury is documented on an accident review form by the area manager of the department in which the incident occurred. Once the paperwork review is completed the area manager is required to present it to the senior staff for their assessment. A root cause analysis and any necessary recommendations are included in the presentation. An example of a recent review displayed an employee reaching to grab a box off the top of a 7-foot tall pallet. The employee failed to use a step stool to assist with the height requirement and ended up reaching above shoulder level to grab merchandise, thus resulting in a shoulder injury. The root cause of the incident was determined to be failing to use the appropriate tools to perform the job. The employee made a choice to continue working without using a step stool to assist them and as a result reached outside of their green zone lifting area. This action was deemed to be a careless action on the part of the employee.

Types of Safety Training Conducted

All new employees are introduced to safe working behaviors through a classroom-style orientation session administered by the safety manager. The course focuses on best methods in freight handling and freight manipulation. It provides an overview to the types of stretches used throughout the building in addition to any area-specific stretches. Further job-specific training is expected to take place during on the job training conducted in each area by a certified training

specialist. Annually each department conducts refresher training administered by the area-specific manager on proper green zone lifting techniques. Additionally, each year employees must successfully complete a computer-based training course on safe working behaviors, scoring at least 80% on the assessment portion of the multiple-choice post class test. All power equipment licensing takes place through a certified trainer. The training consists of observing manufacture-specific safe operator use of equipment videos in conjunction with reading and passing a test on the manufacture's safe use guide. Furthermore, there is a required four hours of on the job utilization prior to licensing the employee on a piece of equipment. After completing the four hours of operation time, the employees are then given a practical test which is administered by a member of the asset protection team. Each year a refresher test is administered and must be passed to remain licensed on the specific piece of power equipment.

Summary

This chapter explored some of the potential hazards associated with working in the warehousing and material handling industry. A briefing of some safety training programs was provided in addition to general information on the Wal-Mart distribution center in Mount Crawford, VA. Potential safety hazards and proactive safety training at the Wal-Mart distribution center were introduced in this section. The next chapter, Methods and Procedures, will communicate the specific methods and procedures used in this research to collect the data.

CHAPTER III

Methods and Procedures

This study was conducted with the assistance of the experimental research design model. The Wal-Mart Distribution Center conducted an ongoing safety program focused around initial new hire classroom training, in which safe working behaviors are taught. Upon entering the work area, on the job, a safety culture based on peer feedback and formalized safety observations are utilized to drive a safe work environment. The safety culture is crafted with the idea of empowering each employee to look out for one another and encourages providing positive and negative feedback to one another on their safe working behaviors. Otherwise, all other safety training was conducted on the job with a certified trainer whom was selected into that role from their previous display of productivity, quality, safety, and peer relations. This chapter covers the population, instrument design, methods of data collection, and method of analyzing the data.

Population

The population for this study were the hourly employees at the Wal-Mart Distribution Center in Mount Crawford, VA, working in non-office, physically demanding jobs, known as floor positions or variable jobs. These employees include, unloaders, orderfillers, and case loaders. At the time of this study there were 685 employees in the warehouse and 513 of those employees were in variable jobs and had completed their on the job training. Of the 513 employees, 107 had been in their job for 12 months or less.

Research Setting

The instrument used in this study was the Wal-Mart Distribution Center located in Mount Crawford, VA. The business incorporated a standard method of capturing and tabulating employee incidents and accidents. A safety manager was assigned responsibility in the

warehouse to track the data, report the data, and create action plans. The tools used included a template to understand the origin of the injuries, an excel spreadsheet designed to capture associate name, injury description, date of injury, objects involved, and root cause analysis.

Data Collection

The data were collected from the safety manager, at the Mount Crawford, VA, Wal-Mart Distribution Center. The data used was historical data collected from February 01, 2016 until January 31, 2017. The Safety Manager had collected and organized the data to present the employees job function at the time of the accident, their length of service with the company, and any unsafe acts discovered during the accident review that could assist in preventing repeat accidents. Since this was existing data, it was accepted as being accurate. The methods and procedures to conduct the study were assessed by the Old Dominion University College of Education Human Subjects Review Committee (see Appendix A for the Letter of Determination of Exempt Status)

Statistical Analysis

Once the data were collected, the researcher analyzed the information to determine if accidents were more prevalent among employees performing their job for less than 12 months. The Chi-Square analysis was used to evaluate the results since this method is best used when determining data in frequencies and the research analyzed the accident rate.

Summary

This chapter covered the methods and procedures involved with the study to encompass the population of the workforce involved. Details on the data collection, and statistical analysis were also presented. The study was conducted using data collected during the time period of February 2016 through January 2017 at the Walmart Distribution Center located in Mount

Crawford, VA. The population consisted approximately 685 employees, both male and female workers. The experience level of employee was 20% of the workforce had been on the job for less than 12 months. The figures used in this study was historical data provided by the Safety Manager which utilized a company provided spreadsheet for data collection. Chapter IV will cover the findings from the data collection.

Chapter IV

Findings

The purpose of this study was to determine if first year distribution center employees have a higher frequency rate of accidents while working in labor intensive jobs than employees with longer tenure performing the same duties. All reported injuries were utilized. The analysis of the data will be presented in this chapter.

Facility Data

Wal-Mart DC 7045

Data was collected and retrieved from the safety manager at the facility for February 2016 – January 2017. During that year, the building instituted a new focus on safety involving the creation of a safety culture where each associate is empowered to provide safety feedback to one another and to embrace safety as a value. Monthly all team meetings were held to discuss safety trends and recent accidents. New signage with pictures and safety slogans were purchased and displayed throughout the Warehouse. No new equipment was introduced during the time of this study. There were 34 hourly workers whom received medical attention, as defined by OSHA standards, during the year (February 2016 – January 2017). Appendix B contains the complete data collected.

Results

To test the null hypothesis, stating that Distribution Center employees who are employed for less than one year have more injuries than employees who are employed for more than a year, a Chi-square test was done using the data in Table 1. With a significance level of .05 the Chi-square statistic is 83.4197. The p-value is $< .0001$ and the result is significant at $p < .05$.

Analyzing the collected data of accidents at Wal-Mart DC 7045 there were 34 hourly employees injured as defined by OSHA standards. From the 34 OSHA recordable injuries, 28 were attributed to the employees with less than 12 months of service with the company. This represents 82% of the total recordable injuries. From the statistical analysis (p-value < 0.0001) it can be concluded that employees who are employed for less than one-year experience more injuries than employees who are employed for more than a year. In order to reduce the number of injuries, it would be beneficial to review and enhance the new hire training program. Table 2 presents the type of injuries that occurred during the year (February 2016 – January 2017). Muscle injuries were the most common type (41.1%). The incidence of contusions is 20.5%, sprains 14.7%, and cuts, eye injuries or other types 23.5%.

Table 1

Data collected at the Walmart Distribution Center during February 2016 to January 2017 from associates involved in accidents or not, based on the Associate's length of service.

Length of service	Associates without Accident	Associates Involved in Accident
Less than 12 months	79	28
Greater than 12 months	400	6

Table 2

Data analysis of the types of employee injuries incurred at the Walmart Distribution Center during February 2016 to January 2017.

Injury Type	Number of occurrences	Percent of occurrences
Strain / Pull	14	41.1%
Cut / Eye injury / Other	8	23.5%
Contusion	7	20.5%
Sprain	5	14.7%

Summary

This chapter presented where the data was collected from, the data collected included the actual number of hourly associates that received medical attention, which meets the define criteria set by OSHA as a medically reported accident. The data is sorted based on their length of service at the facility. Data showed that 82% of injuries reported during the February 2016 to January 2017 period, occurred to associates with less than a year of service. A total of 34 injuries were reported during that time period. The chi-square value is 83.4197, the p value is <0.0001, indicating that employees who are employed for less than one-year experience more injuries than employees who are employed for more than a year. Chapter V will summarize the data and will draw conclusions based on this data.

Chapter V

Conclusion and Recommendations

This chapter contains detail conclusions made from analysis of the collected data. The data was collected from the Wal-Mart Distribution Center in Mount Crawford, VA during February 2016 to January 2017. Accompanying the conclusion are recommendations to the findings and a summary.

Conclusions

It was hypothesized that Distribution Center employees who are employed for less than one year have more injuries than employees who are employed for more than a year. Based on the analysis of data obtained during the period February 01, 2016 to January 31, 2017 of injuries reported at the Wal-Mart Distribution Center, the findings reveal that employees with a length of service of less than 12 months are significantly more likely to have an injury than employees with more than 12 months on the job.

H₀: Distribution Center employees who are employed for less than one year have more muscle injuries than employees who are employed for more than a year.

According to the data collected the findings reveal that employees with less than 12 months service on the job are significantly more likely to have an injury than employees whom have greater than 12 months of service on the job. With a significance level of .05 the Chi-square statistic is 83.4197. The p-value is $< .0001$ and the result is significant at $p < .05$. The null hypothesis (H₀) is therefore accepted. It can be concluded that employees with less than one year on the job have a higher injury rate than employees with more than one year experience. The traditional training program utilized could be a factor in the outcome with the notion that more experience may have an impact of learning through experience.

Recommendations

The safety training program needs to be examined and enhanced to provide greater training to new employees who are more likely to be unfamiliar with safe working practices and proper material handling techniques. The data presented points to a higher accident rate with an employee's back and soft tissue injuries, therefore a certified stretching program designed to target the specific muscle groups could potentially contribute to preventative accident mitigation. A program designed to proactively loosen the muscles and prepare the employee for the actions of the job could help to prime the soft tissues for the work ahead.

Summary

The original purpose of this study was to determine if first year distribution center employees have a higher frequency rate of muscle strains while working in labor intensive jobs than employees with longer tenure performing the same duties and determine if the initial training program needed to be redesigned. Based on the data collected obtained during the period February 01, 2016 to January 31, 2017, the comparison to a specific type of injury was not possible, therefore the analysis was done to compare the incidence of injuries in general between employees on the job for less than a year and more than a year. With the statistical analysis using the Chi-square the findings present the p-value is $< .0001$ and the result is significant at $p < .05$. The data which was collected (February 2016 – January 2017) comprised of the 685 employees at the Walmart Distribution Center in Mount Crawford, VA exposed that employees with less than one year on the job had a higher injury rate than employees performing the same duties for more than one year.

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Appendix A

IRB Letter



OFFICE OF THE VICE PRESIDENT FOR RESEARCH



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Phone(757) 683-3460
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DATE: April 26, 2016

TO: John Ritz

FROM: Old Dominion University Education Human Subjects Review Committee

PROJECT TITLE: [900231-1] New Hire Safety Training

REFERENCE #:

SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS

DECISION DATE: April 26, 2016

REVIEW CATEGORY: Exemption category # [6.4]

Thank you for your submission of New Project materials for this project. The Old Dominion University Education Human Subjects Review Committee has determined this project is EXEMPT FROM IRB REVIEW according to federal regulations.

We will retain a copy of this correspondence within our records.

If you have any questions, please contact Petros Katsioloudis at (757) 683-5323 or pkatsiol@odu.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Old Dominion University Education Human Subjects Review Committee's records.

Appendix B

Data Collection

2016 MEDICALS							
REF #	Injury Date	Area	LOS	Injury Description	Body Part	Injury Type	Root Cause
MD-16-02	2/22/2016	SHIP	181 to 364 Days	Associate felt pain in right wrist	Wrist	Strain / Pull	Other / Unknown
MD-16-03	2/23/2016	SHIP	1 to 5 Years	Associate's knee pinned by PE operator	Knee	Contusion	PE Related
MD-16-04	3/7/2016	DAR	1 to 5 Years	Left wrist, pain/swelling. Cause not known	Wrist	Other	Other / Unknown
MD-16-05	3/20/2016	SHIP	181 to 364 Days	Associate felt pain in left forearm	Arm	Strain / Pull	Other / Unknown
MD-16-06	4/19/2016	BP	181 to 364 Days	Associate hit in the (L) eye with empty box	Eye	Other	Other / Unknown
MD-16-07	4/22/2016	SHIP	181 to 364 Days	Twisted ankle on edge of dock plate walking out of trailer.	Ankle	Sprain	Slip / Trip / Fall
MD-16-08	4/27/2016	RSR	1 to 5 Years	Associate was executing a put away when something fell into his eye.	Eye	Debris in Eye	Failure to Wear PPE
MD-16-09	4/21/2016	DAR	181 to 364 Days	Pain in back while processing low freight	Back	Strain / Pull	Other / Unknown
MD-16-10	5/4/2016	BP	181 to 364 Days	Swollen wrist/arm, unknown cause	Arm	Other	Other / Unknown
MD-16-11	6/1/2016	SHIP	181 to 364 Days	Weights fell out of box fell on toe	Toe	Contusion	Falling Freight
MD-16-12	5/26/2016	SSR	0 to 90 Days	Right Elbow pain from operating RC	Arm	Strain / Pull	PE Related
MD-16-13	5/30/2016	OF	0 to 90 Days	Pain in right back shoulder	Shoulder	Strain / Pull	Lifting / Stacking

MD-16-14	6/28/2016	BP	181 to 364 Days	Bumped back of head on ship line rack	Head	Contusion	Equipment (Non-PE)
MD-16-15	7/1/2016	OF	181 to 364 Days	Associate felt pain in the back	Back	Strain / Pull	Lifting / Stacking
MD-16-16	7/19/2016	SSR	90 to 180 Days	Associate felt a pop in his back	Back	Strain / Pull	Lifting / Stacking
MD-16-19	8/2/2016	DAR	181 to 364 Days	Associate felt back pain while team lifting a pallet of freight to the floor	Back	Strain / Pull	Pallet Handling
MD-16-20	8/10/2016	OF	181 to 364 Days	Assoc felt pain lower right of back bending down to pick up freight	Back	Sprain	Lifting / Stacking
MD-16-21	8/31/2016	OF	10 Years +	Assoc fell from slippery substance on floor on 3rd level of B Mod and cut right arm on metal stopper	Arm	Laceration	Slip / Trip / Fall
MD-16-22	9/1/2016	RSR	181 to 364 Days	Associate stepped on a nail and punctured foot ®	Foot	Puncture	Clean As You Go
MD-16-23	9/13/2016	OF	0 to 90 Days	Cut right finger tip on broken glass	Finger	Laceration	Lifting / Stacking
MD-16-24	10/10/2016	SHIP	0 to 90 Days	Pain in back/shoulder	Back	Strain / Pull	Other / Unknown
MD-16-27	10/20/2016	OF	1 to 5 Years	Punched box and hurt wrist	Wrist	Sprain	Pallet Handling
MD-16-28	10/25/2016	BP	181 to 364 Days	Fell and hurt left wrist	Wrist	Sprain	Slip / Trip / Fall
MD-16-29	10/26/2016	DAR	0 to 90 Days	Associate felt pop in right shoulder	Shoulder	Strain / Pull	Lifting / Stacking
MD-16-31	11/27/2016	BP	0 to 90 Days	A box fell on the associate right foot	Foot	Contusion	Falling Freight
MD-16-32	12/6/2016	SSR	0 to 90 Days	Associate felt a pop in lower back when bending	Back	Strain / Pull	Lifting / Stacking
MD-16-33	12/19/2016	DAR	0 to 90 Days	Throwing freight wrist began to hurt	Wrist	Strain / Pull	Lifting / Stacking

MD-16-34	12/27/2016	OF	90 to 180 Days	40-45 lb rock fell on right foot	Foot	Contusion	Other / Unknown
MD-16-35	12/7/2016	OF	5 to 10 Years	Box fell on associate wrist	Wrist	Contusion	Other / Unknown
MD-16-36	12/19/2016	OF	181 to 364 Days	Pain in lower back	Back	Strain / Pull	Lifting / Stacking
MD-16-37	12/31/2016	SHIP	0 to 90 Days	Pain in lower back	Back	Sprain	Lifting / Stacking
MD-16-38	1/1/2017	SHIP	0 to 90 Days	Pinned himself with extendable	Leg	Contusion	Equipment (Non-PE)
MD-16-39	1/10/2017	OF	90 to 180 Days	pulled muscle in his groin area	Groin	Strain / Pull	Lifting / Stacking
MD-16-40	1/26/2017	OF	0 to 90 Days	Pallet fell on right foot	Foot	Break	Pallet Handling