How Mandatory Stretches Increase Safety In The Workplace

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The construction industry is one that revolves around safety. Without safety this industry fails. Jobsite safety keeps companies afloat longer whether it's financially, physically, or even mentally. This senior project dives into the benefits of mandatory stretching prior to each work day. This study also questions contractors and tests the stretches and their results. These benefits include muscle warm ups, increase of focus, added flexibility, increased range of motion, and even mental awareness. The idea of these morning stretches means more upfront costs for less costs later down the road. These stretches are an extra form of insurance when completed with the proper guidelines. The different GC's that were tested range from small to large in order to get a feel on the different perspectives and their effectiveness. On average these stretches take 10-15 minutes daily from actual work time, and fit in perfect transition of a toolbox talk or all hands meeting. Safety is something we cannot lack in by any means in the construction industry. With that being said, this information will be not only beneficial to large contractors, but small as well and can be directly applied to their way of business.

Key Words: Stretching, Financially, Safety, Flexibility, Insurance

Introduction

There's no secret to mandatory stretching in the construction industry. Stretch and flex programs have been around for years, and some companies have been reaping the benefits ever since. When someone goes to the gym, they don't jump right into their workout, they warm up first. This is to get the blood flowing and reduce the possibility of a sprain/injury. The same could be said for the construction industry. At the beginning of the morning on each jobsite, there often can be a lack of productivity. This would be an ample time to get the blood flowing and the mind ready for the workday. These early morning stretches not only get the body ready for work, but often get the mind working as well. With the idea of safety in the back of your mind to start off your work day, you will constantly be thinking about using a conscious effort to stay safe throughout your work day. This study puts to test the effectiveness of daily stretch and flex programs and how they are useful in small to large general contractors. This paper also dives into the outstanding costs that these companies occur from losing an employee from a long term absence.

Statement & Hypothesis

The topic this author has chosen has to do with safety, and more importantly safety meetings/stretching's on the jobsite. This subject has to do with having meetings each morning,
stretching done each morning, and then weekly check ins on discussing the effectiveness of the stretches them self. This subject is broad enough that it can be tested in nearly every residential, commercial or civil work environments no matter the size. The author found countless areas for research that include safety, and how stretching, daily stretch and flexes, as well as weekly can be beneficial to the workplace. The broadness is almost this subject's downfall, but within that there are small subcategories that test individual tests within the workplace. This topic has nothing to do with testing for things such as equipment failure, jobsite errors, etc. This topic is narrow enough to just track employee errors such as throwing out backs, damaging their eyes, or possibly having more serious injuries. This category is extremely important because our bodies are our most important tools. This is topic is appropriate because, no one has related stretching and warming up to mental awareness. This would be appropriate because it can be tested throughout jobs by counting the number of injuries without stretching, and counting the number of injuries prior to the stretching routines being done. Due to COVID-19, this no longer will be possible, but instead will be a remote case study. This idea of mental awareness would classify as new information, and could possibly lead to a healthier more sustainable workplace environment.

The overall hypothesis is that among the different sizes of companies interviewed, the data will vary. The larger the company the more beneficial these stretches will be and the smaller the company is, the less important these stretches will be. These larger companies are able to endure these larger upfront costs such as losing 15 minutes in the morning to stretches. These stretches will have positive impacts generally later on, but not always right away. The smaller the company, the less they are able to spend these upfront costs due to them only having around 5-10 employees. Although the benefits won’t be the exact same for both, there will be a positive outlook on safety after all the contractors perform the stretches. The last part of the hypothesis has to do with mental awareness. Through the process of talking about safety and the stretches, workers will overall think about safety more through their day. This increased in mental awareness should be prevalent in any company size. With the idea of safety on workers minds first thing in the morning, more safe practices will be carried throughout their day.

**Literature Review**

Stretching before physical activity is a proven way add health benefits to you and your company. The secondary benefits include saving time and money. According to Graham (2013); On average, $5 is spent for every $1 of medical expense on a typical injury. One type of injury that is subject to high costs is strains or soft tissue injuries, sometimes called musculoskeletal disorders. Injuries not only cause pain and suffering for employees, they also have direct and indirect (hidden) costs. These hidden costs are reflected in the time lost for an employee who is not available to accomplish his tasks, as well as the cost of training replacement workers and increased insurance costs. These large amounts of money are often attached to the medical expenses for a long list of reasons. The retraining of a new employee in order to get them up to speed tends to be the biggest. The company not only has to pay another person to train the new person, but they don’t have the injured persons expertise in order to train the new hire.
According to the University of Oregon (2013); the total dollars spent because of injury was $85,372 for stretchers versus $235,131 for non-stretchers. A breakdown of costs revealed that time-loss costs for stretchers were significantly lower than for non-stretchers, $45,597 versus $147,581 respectively. The significant amount of money attributed to these numbers is directly correlated to stretching. Oregon’s numbers show that when stretching is added into the workplace environment, it cuts the costs of injuries to just 36.3%. This is an astronomically large number for any contractor whether small or large. According to USHealthworks (2018); We constantly are lifting heavy objects, pulling objects, and carrying objects. Athletes stretch before these activities... Why not stretch prior to working in construction as well? Obviously, there is a difference in that construction workers don’t earn the same money that athletes do, but from the physical component, they are loading their spine, joints 8, 10, sometimes 12 hours a day in much the same way as a professional athlete. You’re repetitively using your muscles, sometimes more than an. These large amounts of repetitive movements often have very rough outcomes on our body if not stretched out properly. These athletes are treating their bodies with the proper precautions for a long career. Our bodies are said to be our most important tool that we have on the jobsite, and stretching can increase the amount of time our bodies are able to be used.

Stretching is a huge factor in decreasing fatigue. Fatigue can often go forgotten about, but can be an extremely detrimental in next-day workmanship. Often workers will go home, and feel extremely sore either 1-3 days AFTER the day of heavy strain. This strain can cause a plethora of issues down the road if not dealt with early. According to Middlesworth (2020); Stretching increases blood supply and nutrients to joint structures including soft tissues. Stretching increases also soft tissue temperature and allows for greater elasticity of tissues. Stretching increases joint synovial fluid (lubricant for bones and articular cartilage) that allows greater range of motion and reduces joint degeneration. Stretching increases a joint’s ability to move through a greater range of motion with less energy required to do so. This leads to and overall decrease in tightness and resistance in tendons and muscles (less soreness). Overall, stretching will not just lead to better performance TODAY, but better performance throughout time.

Increasing flexibility is what leads to all the other benefits falling into place. Increasing the flexibility is what decreases the rate of injuries which decreases the rate of time an employee takes off for healing, which decreases the amount of time and money wasted. According to Graham (2013), it is clear that workplace stretching do improve flexibility. Morning warm-up exercises conducted with construction workers, for example, can be beneficial for increasing or maintaining joint muscle flexibility. According to Harvard Health, when everything is cold, the fibers aren't prepared and may be damaged. If you exercise first, you'll get blood flow to the area, and that makes the tissue more pliable and amenable to change (Health, 2019). Warming up the muscles is without a doubt necessary before attempting to stretch so tearing doesn’t occur. These workers typically are exposed to manual materials handling and strenuous working positions. Improving flexibility increased the range of motion, joint range and even the enhancement of muscle performance. As Graham stated, with an increase of range motion, items can be lifted with more ease and farther than before. With this being said, flexibility can be the most important advantage of stretching.
The company’s overall goal of this program is to decrease the time and money spent on injuries, and decrease the amount of unnecessary injuries. This makes the jobsites more safe as a whole. According to Graham, it is clear that workplace stretching does improve flexibility. Morning warm-up exercises conducted with construction workers, for example, can be beneficial for increasing or maintaining joint muscle flexibility. These workers typically are exposed to manual materials handling and strenuous working positions. There also may be a psychological benefit at work in a stretching program. Company managers and workers together in a space doing a common activity can create bonding and increase workplace morale. This semi-social grouping or bonding in the workplace creates the perception of caring and support felt by employees from management. This idea of bonding and increasing workplace morale is extremely important when tasks are being done together as a whole. This creates a safer and smoother work crew. This would be accomplished by the togetherness of the morning stretching meetings, similar to an all hands meeting.

**Methodology**

The research strategies the author was planning on before the COVID-19 pandemic occurred included doing studies on a jobsite before and after stretches were implemented. The plan was to work with a group of people, and implement the stretches to all these people, and then record the amount of accidents, if any accidents occur. This data would then be used to compare rates of injuries to the rates without stretching from their past. The author also planned on observing the crews tracking if there was an increase in mental awareness has changed because of the program. Due to the short amount of time the study, and COVID-19 this will now be remote. The approaches to data collection that the author used included contacting the companies individually, and asking if they would like to participate in a research study that will take approximately 15 minutes each morning that could end up helping the rate of injuries go down dramatically. The data is qualitative instead of quantitative. The 3 companies interviewed include Northwest General Engineering, W. Scott Miller Construction, and Pinnacle Power Services. One company is on the smaller side, one is one the medium side, and one is on the larger side. The author then compared the results in each company size and drew conclusions regarding if they are beneficial. The crews in the morning had a list of stretches to do, and how long to do them for. The crews were then instructed to go on with their jobs for the rest of the day, working normally just how they would regularly. After the day is over, the crews would then discuss a list of questions asking if the stretches were beneficial. The techniques for data collection purely end up being field driven data collection. The techniques include real processes that actually test workers out in the field, and monitoring of crews that actually do the experiment.

These almost daily “meetings” on the jobsite give the crew time to stretch, time to think about safety, and talk about the daily plans on a jobsite. The steps in order to complete the Zurich, Manson and Click safety mandatory stretch and flex program are going to be represented throughout these easy to follow pictures below. The program includes a 1-3 minute walking warmup in place or brisk walking that can be done around the jobsite. The following stretches are to be followed right after the walking warmup.
One of the existing posters I found from Click Safety shows the exact process in which stretching should be carried out. See the appendix attached. Each step for each exercise is to be held for a minimum of 15-30 seconds on each side. This come out to right around 15 minutes if done properly. There are four total routines to complete after the mandatory 1-3 minute walking warmup. The first routine includes; the Overhead stretch, 3-point neck stretch, hand stretch, 3-point back stretch, standing hamstring stretch, and standing quad stretch. The second routine includes; large arm circles, upper back/chest stretch, finger stretch, waist twist and hold, ankle flex stretch, and calf stretch. The third routine includes shoulder circles, arm crosses, forearm stretch, low back extension, standing knee lift, and shin stretch. The fourth routine includes small arm circles, upper back stretch, forearm rotation, side bend stretch, low back extension, and Achilles stretch. According to ClickSafety (2018); The following stretches are an important part of an overall strength, exercise, and conditioning program. For employees with musculo-skeletal issues, these stretches should be specifically reviewed by employees with their health care provider(s) before participation.

\textit{Interview Questions}

- Does a 15-minute morning stretching activity help you think about safety more throughout your day?
- Would a 15-minute morning stretching activity be a good idea prior to your work day?
- Do you think a 15-minute morning stretching activity would be a waste of money/time?
- Do participate in heavy lifting during your job?
- How often do you feel fatigued?
- If you knew that stretching could possibly prevent a long term personal injury, would you stretch each morning?
- What are your goals with stretching?
- Would you be willing to try stretching each morning?
- Are you planning on stretching from now on after seeing the results?

\textit{Results and Discussion Study:}

The information gained included learning the importance of actually enforcing the programs themselves, and how these safety programs can often prove less important on small to mid-sized general contractors. The author found out that for these exercises, the smaller company believed the stretches were “annoying and in the way”. According to Luke from W.S.M. Construction; No stretching in the morning would not make me think about safety throughout the day, maybe for a the first hour”. After the long hot tiresome days, the thought of safety began to dwindle as the day progressed. Luke’s jobs were smaller, but more concise on what they where they were working each day. This smaller workplace had a stricter time frame which also makes workers often forget about the stretching. They also believed after a few weeks the program stretches would taper off in usage due to being bothersome. This beats the purpose of the long-term effects, and almost makes the program useless. The goal of this stretching is to have long term safe benefits that will last throughout workers’ careers.
The next result the author discovered is that the program seemed to work a lot better for midsize and large companies. This is due to the idea that these companies are big enough to give up work time/money to reap the long term benefits. This is a large ongoing problem for the smaller companies due to them looking for the short term benefits. The larger companies the author interviewed had a more interesting point of view. According to Zach Frazier from Northwest General Engineering; “I think it depends on whether or not the stretching activity is having a toolbox safety meeting with the stretches. I believe that if people are just stretching and not talking about safety they will more than likely not think about safety throughout their day”. While the entire jobsite is all together on a jobsite whether it’s an all hands meeting, or a safety meeting, this is an ample opportunity for a stretch and flex as well. Zach believes that if you area able to combine a stretch and flex with a toolbox talk, the results will be much better. Although most of the people in the larger companies said they would benefit from stretching, NONE of the companies interviewed were doing stretches previously. According to Frazier, he takes it upon himself to do stretches without being mandatory for his own personal benefits and making sure he never misses work. This is for his own personal health as well as the company’s health. This showed his commitment to his job, and his urge to be better for himself and his company.

The last results the author found were from the larger company. The results were in line with the authors hypothesis which stated that larger companies will benefit more than smaller ones. According to Jake Miller “Stretching prior to my work day does give me some time to think about safety, and what things I can do to help create a safer work area”. These larger companies often have these ideals built in to them. Jake also stated that, “It would be more of a waste of time and money if someone were to injure themselves and be out of work for a longer period of time instead of doing a quick 15 minute morning stretch”. This references the idea that these larger companies are able to afford these smaller upfront costs in order to receive larger benefits later down the road.

Conclusion

The majority of the problems the author encountered revolve around the COVID-19 pandemic. This made it next to impossible to interview people in the field about experiences in stretching. Without the pandemic the author would’ve been able to get out into the field more and get personal with people. However, this pandemic did allow analyzation from a remote perspective which instead allowed for more qualitative research. The research was almost spot on compared to the hypothesis except for the mental awareness aspect. The smaller the company was, the less important the stretches seemed to be. The larger the companies were, the more inclined they were to do the stretches. The part of the hypothesis that was incorrect was the mental awareness aspect. This researcher believed that starting the day off with safety in that back of their mind would carry throughout the day. Instead everyone interviewed all concluded it did not help think about safety for the rest of the day, or only lasted for a short time period. One did say “It lasted for around an hour and then faded away”. This is where the conjoined safety meeting and stretch in flex would help. With that being said, stretches are an extremely important part of construction, but it will be up the discretion on the contractor whether or not they want to add it to their daily routin
References


## Appendix

### Routine 1
- **Overhead stretch**
  - Cross your hands behind your back.
  - Pull your hands towards your chest.
  - Hold for 10 seconds.

### Routine 2
- **Large arm circles**
  - Circle your arms in a large arc, keeping your shoulders relaxed.
  - Repeat 10 times in each direction.

- **3-point neck stretch**
  - Place your hands on your ears.
  - Slowly stretch your neck to the right.
  - Hold for 10 seconds, then repeat to the left.

- **Upper back/shoulder stretch**
  - Stand with your arms stretched overhead.
  - Slowly rotate your torso to the right.
  - Hold for 10 seconds, then repeat to the left.

### Routine 3
- **Arm circles**
  - Circle your arms in a large arc.
  - Repeat 10 times in each direction.

- **Standing hamstring stretch**
  - Stand with your legs apart.
  - Slowly bend forward at the waist.
  - Hold for 10 seconds.

- **Wrist and hand**
  - Slowly flex your fingers forward.
  - Hold for 10 seconds.

### Routine 4
- **Shoulder circle**
  - Circle your shoulders in a large arc.
  - Repeat 10 times in each direction.

- **3-point back**
  - Place your hands on your hips.
  - Slowly stretch your back to the right.
  - Hold for 10 seconds, then repeat to the left.

- **Upper back/shoulder stretch**
  - Stand with your arms stretched overhead.
  - Slowly rotate your torso to the right.
  - Hold for 10 seconds, then repeat to the left.

### Benefits of stretching
- **Improved flexibility**
- **Reduced risk of injury**
- **Enhanced performance**
- **Increased circulation**

### Stretching essentials
- **Warm up**
  - Perform stretching exercises before your workout.
  - Start with lighter stretches.

- **Cool down**
  - Perform stretching exercises after your workout.
  - End with longer stretches.

## Standing exercises
- **Shoulder twist**
  - Stand with your feet shoulder-width apart.
  - Slowly twist your torso to the right.
  - Hold for 10 seconds, then repeat to the left.

- **Arm circles**
  - Stand with your arms outstretched.
  - Slowly circle your arms in a large arc.
  - Repeat 10 times in each direction.

## Sitting exercises
- **Hip flexor stretch**
  - Sit on the floor with your legs straight in front of you.
  - Slowly lean forward, reaching towards your toes.
  - Hold for 10 seconds.

- **Lower back extension**
  - Sit on the floor with your legs straight in front of you.
  - Slowly lean back, arching your back.
  - Hold for 10 seconds.

## Exercise progression
- As you progress, increase the duration of each stretch.
- Gradually increase the intensity of the stretches.

## Additional resources
- **Stretching app**
  - Use a stretching app to guide you through the exercises.

- **Online videos**
  - Watch online videos for demonstrations of each stretch.

## Conclusion
- Regular stretching is essential for maintaining flexibility and reducing the risk of injury.
- Personalize your stretching routine to meet your specific needs.
- Consult with a professional if you have any concerns or questions about stretching.