

# 50 Years of Misinformation — Squat Lifting Is Not Safer Than Stoop Lifting

By: Blake McGowan | July 30, 2020

Blake McGowan is the director of research for VelocityEHS | Humantech. He leads the Ergonomics Research group to incorporate the latest technical and scientific data into VelocityEHS | Humantech's software solutions. He also consults with academia to transfer the latest research knowledge into the VelocityEHS | Humantech approach, systems, assessment methods, and guidelines. He can be reached at [bmcgowan@ehs.com](mailto:bmcgowan@ehs.com).

---

Surprise! More research has just confirmed that squat lifting (knees bent and back straight) techniques are no safer than stoop lifting (knees straight and back bent) techniques in the workplace. To be accurate, the risk of injury while using squat lifting techniques is slightly greater than when using stoop lifting techniques.

Lifting any heavy object from the ground, no matter the postural technique, is considered high risk, according to a group of German researchers in 2016. The researchers used new in vivo techniques surgically implanted strain gauges to measure the actual spinal loads during both squat and stoop lifting techniques during manual lifting from the ground.

## The research resulted in two important findings:

Lifting any object from the ground results in significant spinal loading, independent of squat or stoop lifting techniques. This confirms what we already know — the magnitude of spinal loading during manual lifting is a primary biomechanical risk factor for low back disorders (LBDs).

The maximum spinal forces were basically identical for both squat and stoop lifting techniques. In fact, the forces were 4% greater when squat lifting.

The question “Which is safer: squat lifting or stoop lifting?” has been asked and debated in both academia and practice since the 1970s.

Finally, in 1999, researchers from The Netherlands reviewed 27 high-quality studies related to proper lifting techniques. The conclusion: Biomechanical literature does not provide support for advocating the squat technique as a means of preventing low back pain.

Yet, practitioners continued to debate and implement lifting techniques as a control to reduce LBDs in the workplace.

Despite all of the research, there has been an explosion of athletic trainers promoting wearable devices that promote and reward squat lifting techniques as the safer approach — causing more confusion as to what is and isn't safe. But the data is telling us otherwise.

## The Numbers

Overexertion activities or manual materials handling activities ranked first among the leading causes of disabling injuries in the United States for the last two decades. These include lifting, pushing, pulling, holding, carrying, or throwing objects. (2020 Liberty Mutual Workplace Safety Index)

Businesses spent \$13.98 billion on overexertion injuries in 2019, accounting for 23.5 percent of the overall national financial burden.

\$13.2 billion was the direct cost in 2002, accounting for 26.6 percent of the overall national financial burden.

The numbers tell us that not much has changed. Why is this a concern?

Globally, the lifetime prevalence of LBDs is reported to be as high as 84%.

Based on the U.S. adult population, approximately 34 million people will experience a LBD at some point, which is about 31% of the population.

Annually, there are also more than 8 million new occurrences of LBDs in the U.S. adult population. More than half (4.6 million) are reported as a back-muscle strain, while just under half (4.1 million) are described as disc degeneration, herniation or rupture.

Overall, the prevalence of LBDs is not too far from the most commonly occurring fatal and non-fatal chronic health concerns in society. According to OSHA's Safety Pays, the direct cost associated with LBDs ranges between \$22,500 and \$76,000.

## So, What Do We Do?

First, educate people about the risks of lifting a heavy object from the ground, no matter the lifting technique used.

Second, understand that providing lifting technique training or wearables to promote proper lifting techniques is a waste of time; it does little to reduce the risk of LBDs.

Lastly, and most importantly, know that the only way to reduce the risk of LBDs is to implement engineering controls to raise the hand working height and reduce or eliminate the weight of the object, which also reduces force. &

Risk Insiders are an unrivaled group of leading executives focused on the topic of Risk. They share their insights and opinions – and from time to time their pet peeves and gripes.

Each Risk Insider is invited to publish based on their expertise, passion and/or the quality of their writing. The only rules are no selling and no competitor put-downs.

The views expressed in this article belong to the author and are not an editorial opinion of Risk & Insurance.