



Under Pressure:

Impact of Increased Body Mass Index on Spinal Degeneration

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Abstract

The rising prevalence of diabetes, heart disease, and strokes has led to an increased awareness of the dangers of the obesity epidemic. This study aimed to explore the less commonly known connection between having an unhealthy body mass index (BMI) and spinal disease. By analyzing a sample of spinal fusion patients, this study supports a strong correlation between spinal degeneration and obesity. The data collected in this study reveals the importance of modifying sedentary lifestyles, managing a proper diet, and taking steps to prevent further spinal damage.

Introduction

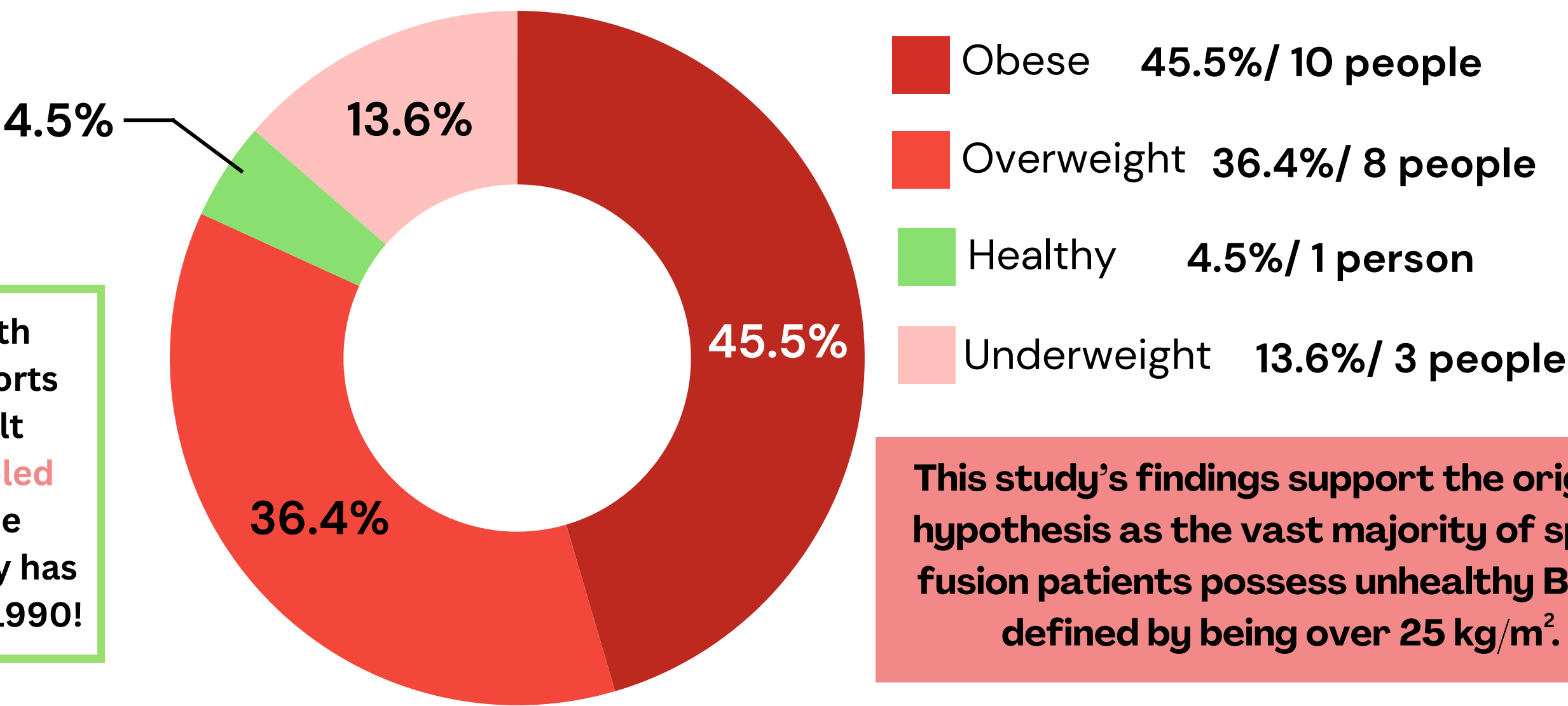
Being overweight is a major risk factor for various spinal diseases, including chronic back pain. Putting excessive weight on the spine can lead to the narrowing of the spinal canal, leading to numbness and tingling in the neck, arms, and legs. Increased pressure on the spinal vertebrae also leads to compression of the bones, accelerated disc degeneration, and a higher risk for herniated discs. Patients with an unhealthy BMI will see increased rates of accelerated disc degeneration along the spine that worsens in severity with the higher level of body mass index.

Methodology

The investigation into the link between body mass index and spinal degeneration was conducted through a quantitative study. The BMIs of 22 patients that received a spinal fusion at Memorial Hermann Southwest from February 2025 to April 2025 were collected. Based on categories separated by spinal regions, data analysis to find the underlying patterns in the collected BMIs was conducted. The BMI categories in this study followed the classifications outlined by the National Institutes of Health.

Results and Findings

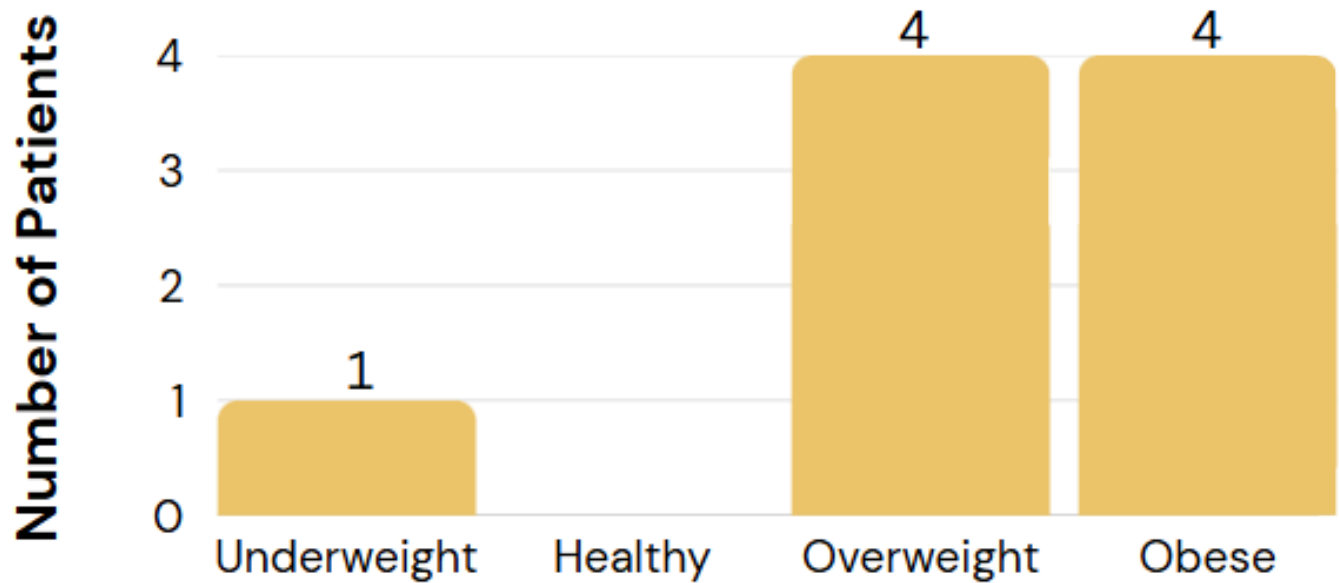
Body Mass Index Distribution of Spinal Fusion Patients



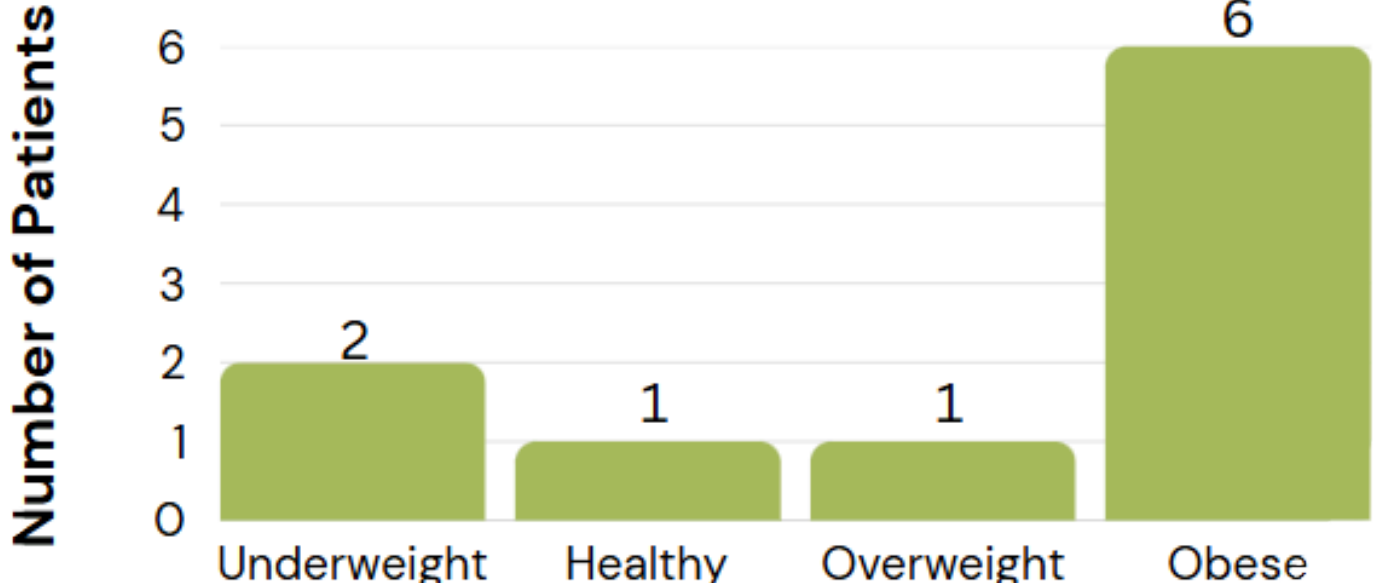
The World Health Organization reports that global adult obesity has **doubled** while worldwide adolescent obesity has **quadrupled** since 1990!

This study's findings support the original hypothesis as the vast majority of spinal fusion patients possess unhealthy BMIs, defined by being over 25 kg/m².

Distribution of BMIs of Cervical Spinal Fusion Patients

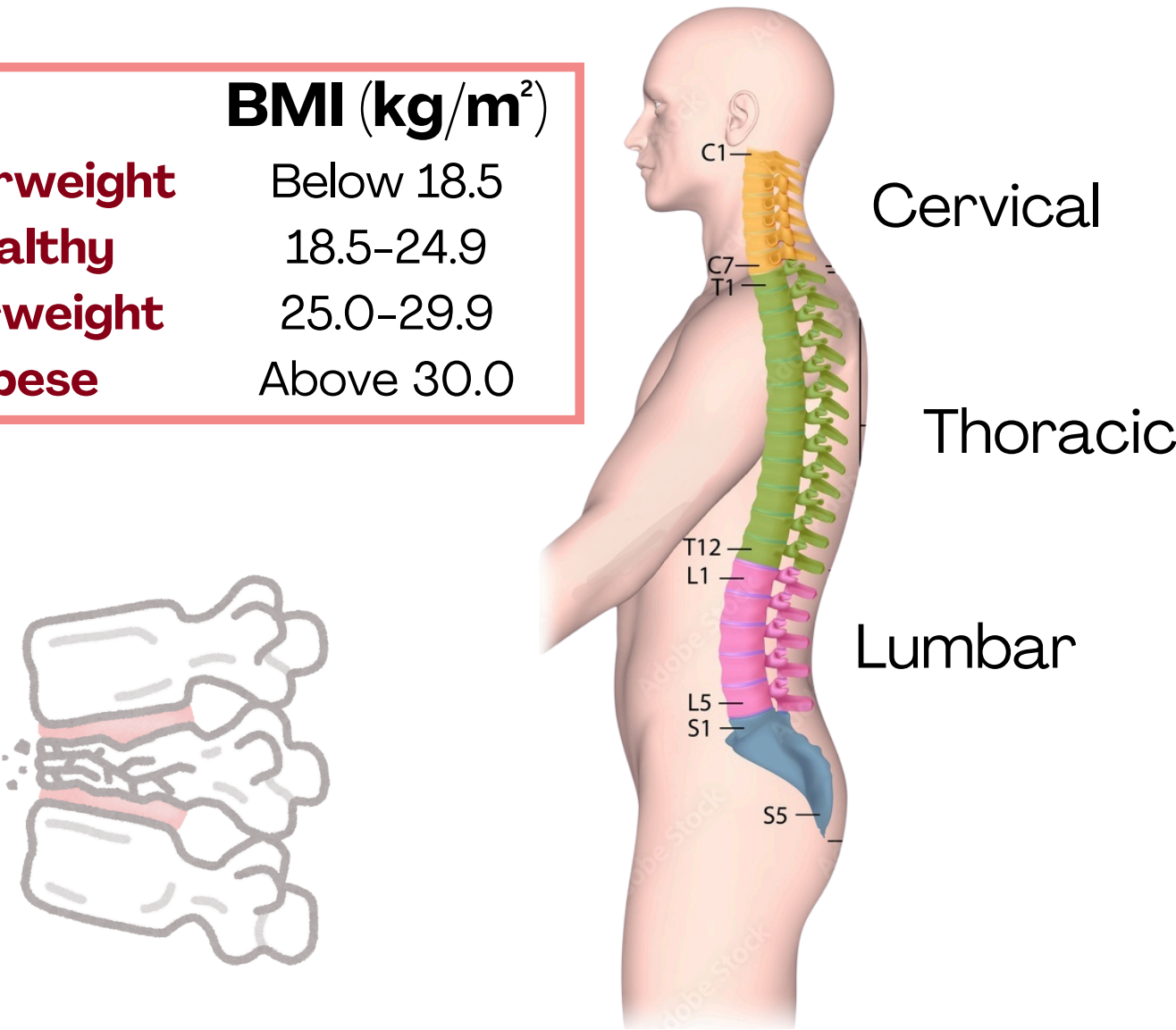


Distribution of BMIs of Thoracic Spinal Fusion Patients



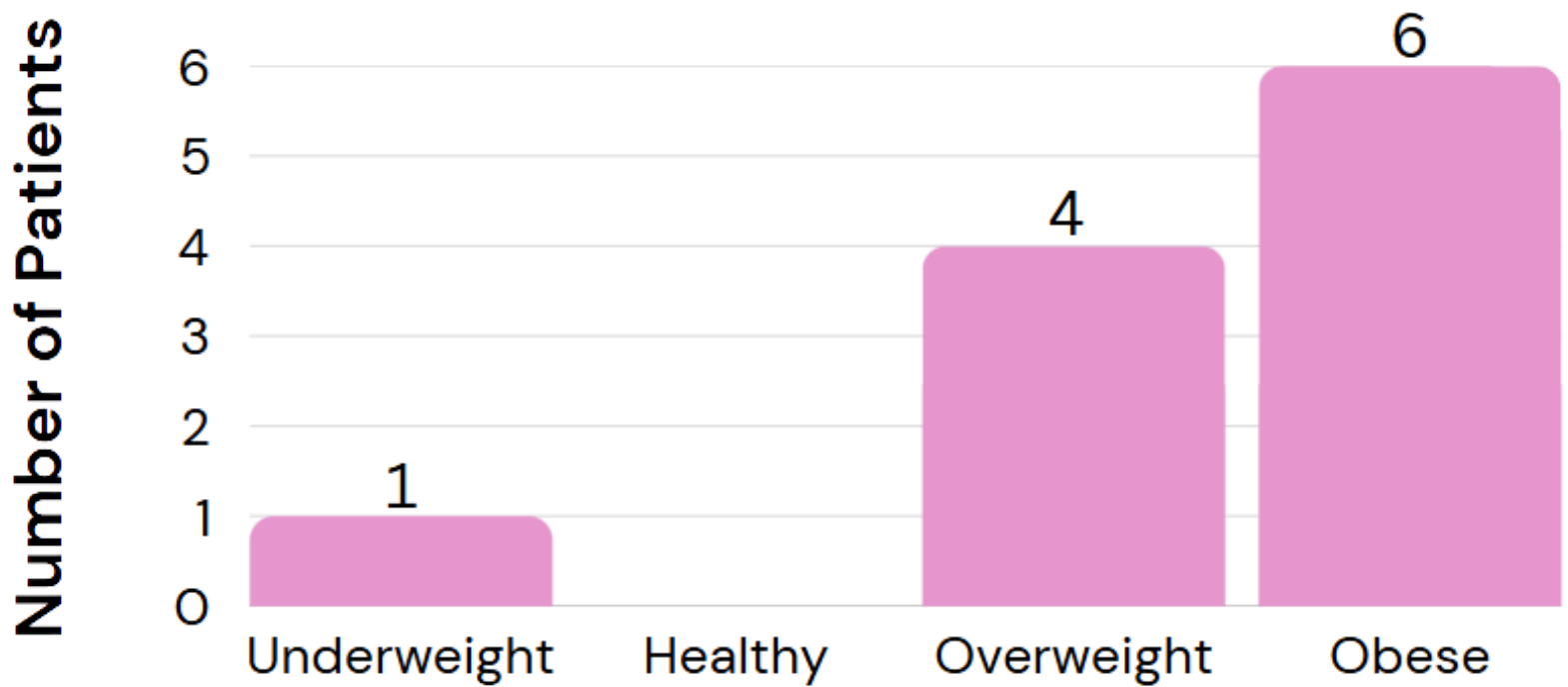
Body Mass Index Category

| | BMI (kg/m ²) |
|-------------|--------------------------|
| Underweight | Below 18.5 |
| Healthy | 18.5-24.9 |
| Overweight | 25.0-29.9 |
| Obese | Above 30.0 |



Body Mass Index Category

Distribution of BMIs of Lumbar Spinal Fusion Patients



Body Mass Index Category

Discussion

Though BMI is an useful indicator of health, it has a critical limitation. Body mass index does not differentiate between weight sourced from muscle and weight originating from fat. Though both affect BMI equally, they signify very different health statuses of a patient. In this study, BMI was selected as an appropriate variable as most patients were sedentary and did indeed have a high level of body fat.

Other variables that limit this study include age, smoking history, and genetic risk factors that impact a patient's severity of degeneration. The majority of patients were 50-80 years old but variances in their levels of physical activity and lifestyle will have impacted their level of spinal damage.

Next Steps

This study was restricted to only those who received spinal fusions, representing a small fraction of individuals who suffer from chronic back pain influenced by obesity. Most doctors will suggest conservative treatment such as physical therapy, medications, or changes to a patient's lifestyle before surgery. Though spinal fusions have a high success rate, they remain an invasive process, often requiring screws, rods, or plates to be placed in patients.

The results of this study should be used to bring further awareness to the detrimental effects of sedentary lifestyles and damaging diets. This data may be used by clinics and physicians to convince patients to exercise more frequently, consume nutritious meals, and maintain a healthy body mass index.