P10: Hamstring Length, Lumbar Spinal Range of Motion, Pelvic Tilt, Pelvic Mobility, & Low Back Pain Among Racially Diverse Employees

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Introduction: Back pain is one of the most common musculoskeletal problems, accounting for 25% of all disabling injuries in the United States. Previous research on lumbopelvic dysfunction has focused on a variety of physiological and anatomical parameters and found that lumbopelvic imbalances produce increased anterior tilt of the pelvis and exaggerated lumbar lordosis. The exact relationship of decreased pelvic mobility, hamstring length, and spinal active range of motion (flexion) remains unclear.

Purpose: The purpose of this study was to investigate the relationship of various physical factors (hamstring length, spinal AROM, pelvic tilt, and pelvic mobility) that result in self-reported low back pain in racially diverse employees in a physically demanding job within a university setting. It was hypothesized that decreased hamstring flexibility and pelvic mobility are contributing factors to low back pain.

Methods: This was a quasi-experimental, correlational design. A convenient sample consisting of 30 racially diverse male employees who were employed by a major research University physical plant (maintenance, grounds, vehicle repair, custodial) and who were at least 3 months were recruited to participate in this study. Participants completed the informed consent and a general demographic/screening questionnaire. Physical measurements including: Anthropometrics (height, weight, BMI, girth), Straight leg raise (avg. of 3 bilaterally), Lumbar spine AROM (Saunders Digital inclinometer), Pelvic tilt position (flexicurve), and Pelvic mobility utilizing osteopathic spring techniques. All measurements were obtained via blinded testers at each station. Statistical data analysis included descriptive analysis and Spearman Correlation using SPSS Version 14.0.

Results: Descriptive stats are as follows: BMI (X = 29.0; df = 6.3), SLR-R (X = 64.1; df = 14.3); SLR-L (X = 67.6; df = 17.1);T12 – L1 spinal inclination angle (X = 75.4; df = 14.5); L5 – S2 spinal inclination angle (X = 42.2; df = 14.0); Pelvic tilt inclination angle (X = 0.07; df = 0.027); Osteopathic pelvic spring: 57% hypomobile posterior rotation anterior ilium; 64% hypomobile inferior stress anterior ilium; 60% hypomobile superior stress to ischial tuberosity; 57%

hypomobile inferior stress to posterior ilium. Spearman Correlation significant (p<.05) for SA-1:SLR-R (.44); SA-1:SLR-L (.41).

Conclusions: Although the findings indicate that each variable contributes to lumbopelvic dysfunction and the resulting report of low back pain, the exact role of each remains unclear. Reliable interpretation on the source and role of lumbar lordosis, hamstring tightness, and pelvic immobility is only possible if additional information on lumbar ROM, pelvic tilt, abdominal strength, and pelvic mobility (rotation, slide (slip), side bending, and spring) is available.