College of Health and Pharmacy

Physical Therapy **Abstract No. PT-5**

CAN BLOOD FLOW RESTRICTION TRAINING REVERSE LONG-STANDING QUADRICEPS WEAKNESS?

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Background:
Blood Flow Restriction Training (BFRT) involves the application of a tourniquet device during resistance exercises, offering a method for muscle strengthening with low-load training, which reduces stress on joints and tissues. BFRT is commonly employed in rehabilitating injuries of the knee including ligament injuries and damage to the menisci. Previous studies suggest that BFRT induces hypertrophy through a combined response to metabolic stress and mechanical tension.

Purpose:
This study investigated if BFRT could address long-standing quadriceps weakness following ACL, medial meniscus and MCL injury, commonly referred to as the "unhappy triad."

Study Design:
A case study was conducted on a 24-year-old female soccer player, five years postoperative ACL and meniscus repair, who reported knee pain, weakness, and instability during functional activities and sports.

Methods:
The participant underwent BFRT sessions twice a week for eight weeks. Exercises were performed with 80% blood flow restriction on the affected limb, interrupting arterial blood flow during 3 exercises with a 2-minute rest break in between exercises during which the cuff was deflated. Exercises included unilateral knee extensions, step-ups, and leg presses, comprising four sets of each exercise with repetitions of 30, 15, 15, and 15, with 30 seconds of rest in between each set.

Results:
Our study revealed improvements in maximal volitional isometric contraction (MVIC) torque, burst torque, self-reported confidence, and thigh symmetry. MVIC torque of the affected limb increased by 8.5% and burst torque increased by 23% indicating enhanced strength.
Conclusion:

The case study highlights promising outcomes of BFRT in improving strength in the knee extensor muscles of persons with chronic weakness. Future research should explore qualitative assessments and BMI, skinfold measurements, and functional evaluations to provide a comprehensive understanding of BFRT's efficacy.