POSTERIOR LAT.}


to the experiment strategies and tests including the Y Balance Test provides a dynamic balance measure of anterior, posteromedial, and posterolateral reach. The maximal reach distance (cm) over three repetitions was recorded for the six movements. These maximal reach values, coupled with leg length, were used to arrive at a composite balance score for each leg using the following equation (5):

\[ \text{Composite Balance Score} = \frac{\text{Maximal Reach Distance}}{\text{Leg Length}} \times 100 \]

Figure 1: Y-balance test. The three basic movements of the Y-balance test are depicted. Subjects performed each movement with the right and left leg, while balancing on the opposite leg.

Knee Joint Range of Motion: Goniometry was used to assess the range of motion in the knee joint. With the use of a goniometer (Baseline Medical, Fishers, IN), knee flexion, extension, internal rotation, and external rotation was measured in degrees (°).

Statistical Analysis: Dynamic balance composite score, knee extension/internal rotation, and external/external rotation were compared between M and F, the sex main effect, when pooled across PKB (CON, HGB, NHB) M and F did not differ significantly (p>0.05) from CON for internal rotation (HGB=21.9°, NHB=21.5°, CON=139.0°), but external rotation (HGB=10.0°, NHB=10.1°, CON=139.0°). The difference in knee brace interaction presented in the following equations.

RESULTS

Age and Body Composition: M and F did not differ significantly (p>0.05) with regard to age (M=22.4±2.4 yr, F=21.2±1.1 yr), but did differ significantly (p<0.05) in body mass (M=87.6±16.3 kg, F=71.1±16.3 kg), body stature (M=170.6±2.6 cm, F=167.5±2.6 cm), and percent body fat (M=19.2±2.8%, F=11.0±2.7%).

Male vs. Female Main Effect: When pooled across the three brace trials (CON, HGB, NHB), M and F did not differ significantly (p>0.05) in knee flexion, external knee rotation, right leg balance, and left leg balance. However, they did differ significantly in knee extension (M=8.0±2.1°, F=6.6±2.4°, p=0.04), and external knee rotation (M=29.7±7.5°, F=35.6±7.9°, p=0.04).

Sex x Knee Brace Interaction: M and F did not respond significantly different (p>0.05) to the brace trials (HGB, NHB, CON) for any of the dependent variables.

Figure 2: Knee brace main effect for knee flexion. When pooled across M and F, both HGB and NHB differed significantly (p<0.0001) in range of motion from CON.

CONCLUSIONS

The research regarding the effects of prophylactic knee bracing on performance is limited, resulting in minimal available information on how these braces affect range of motion and dynamic balance. The results of this study rendered valuable information with regard to these variables. As presented in the results, knee range of motion, excluding external rotation, was hindered when wearing the braces. However, dynamic balance was not altered. Many people, especially athletes, use prophylactic braces to reduce the risk of knee injury during performance while not knowing the effects that the braces can have on their performance. Further investigation should be made into whether or not the mobility limitations introduced by these braces are offset by the injury risk reduction they provide. Additionally, further investigation is needed to determine whether this decreased range of motion is detrimental to performance or function in day-to-day activities.

REFERENCES