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Title: The acute effects of dynamic warmup on single leg balance test in school children

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The acute effects of dynamic warmup on single leg balance test in school children

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Introduction

Balance is one of the components of physical literacy. The immediate effects of two different kinds of dynamic stretching on static balance in school children have not been investigated. Therefore, the aims of this study were to 1) determine if two different kinds of dynamic warmup were associated with performance of open eyes and closed eyes single leg balance tests in school children; 2) explore any response differences between boys and girls on balance performance after performing the two dynamic warmups.

Methods

This study employed a randomized, crossover with repeated measures design. After a static warmup protocol and familiarization session, 61 school children (age: 10.5 ± 0.8 years; height: 1.35 ± 0.06 m; weight: 31.5 ± 6.2 kg; BMI: 17.1 ± 2.3 kg/m²) performed two baseline measurements, namely single leg balance test with open eyes (T1) and with closed eyes (T2) in random order with their dominant leg on the floor. Warmup protocol: Warmup A (WA) - Four points formed a square with 30cm length. Children started at left bottom corner and hopped with their dominant leg with 1-sec pace between each point six cycles clockwise. Warmup B (WB) - Their dominant leg stepped on the floor, the other leg stretched out to 3 points located 30cm from the dominant leg at the sequence of anterior, posteromedial and posterolateral directions eight times with 1-sec pace between each point. Procedure: Each child performed one warmup (WA/WB) and two tests (T1 and T2). After 2 min rest, they performed the other warmup and the two tests. The warmups and tests order were randomly assigned.

Results

Results of Multivariate tests showed that there was no statistically significant differences in two main effects (WA & WB), gender and no interaction was observed $F(4, 352) = 0.482$, $p = 0.749$; Wilk's $\lambda = 0.989$, partial $\eta^2 = 0.005$. Results of one-way ANOVA showed that there was no statistically significant differences among baseline, WA and WB in T1 ($F(2, 180) = 0.472$, $p = 0.624$) and in T2 ($F(2, 180) = 0.160$, $p = 0.852$). The girls obtained the mean values of T1 increased 1.7 sec or 0.04% after WA and increased 6.0 sec or 14.5% after WB, whereas the boys obtained the average values of T1 decreased 0.6 sec or 1.45% after WA and increased 0.9 sec or 3.2% after WB. No improvement in T2 was observed in girls after performing WA and WB, while the average values of T2 increased 2.3 sec or 17.8% after WA and increased 2.2 sec or 17.1% after WB.

Discussion

These findings suggested that the use of WB improved the performance of T1 in girls, while the employment of WA improved the performance of T2 in boys. Our findings were limited to school children of age group from 9 to 11 years old. The underneath mechanism is not clear. Some children reported tiredness of their dominant legs at the end of the tests.