

A Body-Scaling Approach to Modifying Sports Equipment for Children: A Badminton-Based Experimental Study

ABSTRACT

A body-scaling approach, namely pi ratios, has been developed to provide systematic guidelines for manipulating junior sports. This approach is used to reduce the constraints in junior sports as efficiently as possible, facilitating children to learn the skills quickly. Therefore, the study aimed to examine the best racquet size by demonstrating a body-scaling approach to modify racquets using arm length-to-racquet length ratios. A total of twelve boys with one to two years of badminton experience participated in the study. The arm length of participants was measured to create arm length-to-racquet length ratios. Participants executed badminton skill tests (e.g., short serve, clear, and drop) using three types of racquets which were racquets A (1.1:1.0), B (1.0:1.0), and C (0.9:1.0). One-way ANOVA with repeated measures was conducted to compare the scores in all badminton skills tests across the three types of racquets. The findings of this study showed that participants performed best in skills tests when using racquet B, which had a pi ratio of 1:1 for arm length-to-racquet length ratios compared to racquets A (1.1:1.0) and C (0.9:1.0), $p < .05$. Coaches can modify junior sports equipment through anthropometric measurements of arm's length in badminton. In order to effectively foster skill development, it is crucial to provide children with the proper size of equipment during the early stages of motor learning