ABSTRACT

THE USE OF BIOMECHANICAL FEEDBACK TO IMPROVE VERTICAL JUMP PERFORMANCE

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The vertical jump is an important element of many sports. Biomechanists have identified a few characteristics of skillful jumping, but there is limited research examining the use of biomechanical feedback for improving performance. The purpose of the present study was to investigate the efficacy of biomechanical feedback in improving the process and product of the jump.

Fourteen female college basketball players participated. Subjects were randomly assigned to the control or treatment group. All subjects completed five maximal countermovement jumps with arm swing. Based on the knee angle in the pre-feedback jump subjects were placed into the deep (below 95°), moderate (between 95 and 110°), or shallow group (above 110°). Control subjects were told they were capable of jumping higher regardless of their performance, whereas treatment subjects were given feedback based on their knee angle. Deep and moderate subjects were asked to reduce
knee flexion and be quicker; shallow subjects were asked to increase knee flexion and not be in a rush. Each subject was also allowed to view her jump on video; each treatment subject saw her deepest position with an overlay of desired knee angles. Following a brief period of practice subjects completed five maximal post-feedback jumps. All pre- and post-feedback jumps were videotaped. Video analysis of a representative pre- and post-feedback jump was completed for each subject.

Difference scores for the moderate control and treatment groups were statistically compared. Treatment subjects reduced range of motion compared to control subjects but this was not significant ($p = 0.09$). Compared to the control subjects the treatment subjects made significant changes by reducing depth of descent ($p = 0.03$), decreasing time of propulsion ($p = 0.03$) and increasing jump height ($p = 0.03$). Using verbal and visual feedback appears to be an effective means of improving both the process and product of the vertical jump.