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EFFECTIVENESS OF SHORT-TERM JUMP TRAINING BASED ON FORCE-VELOCITY PROFILING USING BAYESIAN STATISTICS

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Objective: This randomized controlled trial investigated the effectiveness of short-term jump training, individualized based on force-velocity (Fv) profile, on jump performance. **Methods:** Twenty-seven combat athletes were randomly allocated to either a jump training or control group. Pre- and post-measures (2 weeks apart) included countermovement jump (CMJ) and squat jumps (SJ) performed unloaded and with four loads (25, 50, 75, and 100% of body mass). Jumps were executed on a force plate to enable Fv profiling. The jump training group completed four jump training sessions over two weeks (twice a week), consisting of 8 sets of 5 jumps. Training was prescribed individually based on each athlete's Fv profile, categorized as "heavy" (75 and 100% body mass) or "light" (0 and 25% body mass). Participants of both groups continued their regular combat sports training. Jump performance reliability was assessed using the intraclass correlation coefficient (ICC), typical error (TE), and smallest worthwhile change (SWC). The statistical analysis adopted a Bayesian framework. Bayesian paired and independent samples t-tests were used to assess within- and between-group differences. A Bayesian mixed-factor ANOVA was conducted to compare the predictive performances of competing models. Additionally, correlation analyses with one-sided alternative hypotheses explored associations between changes in jump height and changes in Fv profile variables (i.e., Pmax, SFV, F0, and V0). Bayes factors were used to evaluate the strength of evidence. **Results:** Reliability analysis demonstrated excellent measurement consistency (ICC=0.94) and low TE (1.57 cm; 3.78%); the SWC was 1.14 cm; 2.87%. A Bayesian paired t-test revealed very strong evidence of improvement in the jump training group (BF=66.48; effect size=0.89), while only anecdotal evidence of change was observed in the control group (BF=0.45). The between-group comparison indicated a greater mean improvement in the training group (3.7%) versus control (0.9%), with anecdotal evidence favoring the training (BF=1.62). A Bayesian mixed-factor ANOVA indicated that the data were best represented by models including time (BF=4.49) and time+group (BF=3.48), providing moderate evidence in favor of these models compared to the null. In contrast, the time×group interaction model showed only anecdotal evidence relative to the null (BF=2.42). Correlation analysis revealed moderate evidence of a positive relationship between changes in Pmax and jump height (r=0.32; BF=6.36). In contrast, changes in SFV (r=−0.07; BF=0.17) and F0 (r=0.04; BF=0.31) favored the null hypothesis, while the association with V0 (r=0.21; BF=1.40) yielded only anecdotal evidence. **Conclusion:** This study provides evidence that a short-term jump training can lead to meaningful

improvements in CMJ performance. However, the limited between-group evidence suggests that while improvement occurred, it may not significantly exceed those from regular combat training. Additionally, only Pmax was associated with jump performance gains, with a coefficient of determination of ~10%, raising questions about the overall effectiveness of training prescriptions based on Fv profile. Future research with larger samples and longer interventions is needed to further evaluate the utility of this approach.

Key words: Combat Athletes. Jump Performance. Countermovement Jump.