Impact of a 10-Week Strength Training Program on Physical Performance and Match External Load in Young Elite Female Soccer Players

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Abstract— Soccer is a demanding sport that requires high-intensity efforts, particularly in women's competitions. Improving high-speed running and aerobic capacity enhances performance. Strength training can improve these, but its use in young female players is underexplored. This study aimed to investigate the effects of a 10-week in-season strength training program on physical performance and match running demands in young female soccer players. Thirty-two U18 Danish female professional soccer players from two comparable teams voluntarily participated in the study. Teams were allocated to either an experimental group, performing twice-weekly strength training (EG, n=16) or a control group (CG, n=16). Vertical jump performance and Yo-Yo IR2 performance for maximal oxygen uptake (VO2max) were assessed both pre and post intervention. Additionally, players' match external demands (i.e., total distance, distance covered at speeds above 23 km·h^{-1}, and maximum velocity achieved) were monitored using Global Positioning System devices during four matches before and after the intervention. Significant within-group differences were observed across all variables for the EG (p=0.001; ES=1.08 to 1.45, large), without differences in the CG (p>0.01). Between-group analysis indicated significant differences favoring the EG in all variables (F=27.40 to 47.17; p=0.001). The application of a 10-week strength training program led to improvements in physical performance and match running demands among young female soccer players, underscoring the importance of incorporating strength training programs into female soccer periodization to enhance performance.

Keywords— Resistance Training; Women; Football; Team-Sport; GPS