

On the Efficacy of Low-Dose Plyometric Training

Study Review of Nonnato et. al (2022)

Rory O'Brien, MS, CSCS, PES
Guardian Strength and Conditioning

Plyometrics, which leverage the stretch-shortening cycle and elastic properties of muscles, are utilized by athletes of nearly all sports and tactical occupations. Due to their versatile nature and beneficial adaptations that apply to more than jumping ability, endurance athletes, team sport athletes, tactical athletes, and power athletes alike can gain much from the inclusion of plyometrics in their training programs. Plyometrics are also useful for performance enhancement in men and women, and due to the ability of plyometrics to serve as an injury-reducing buffer against knee injury, it is therefore all the more essential for female athletes to perform them due to women having a higher risk of ACL injury than men.

Nonnato et al. (2022) found a lack of research in specific training interventions in elite levels of female soccer, and due to the beneficial nature of plyometrics overall, decided to investigate the role of plyometrics as an in-season training intervention among professional female soccer players. As a sport, soccer is highly dependent upon fitness abilities such as change of direction, sprint speed, acceleration, and explosiveness – all of which have been demonstrated to be impacted positively by plyometric training. However, due to time constraints on professional athletes during the season – such as technical practice, skills training, competition, and travel – it can be difficult for them to perform high volumes of plyometrics. For this reason, the researchers investigated the effect of a twelve-week in-season plyometric training program on power, change of direction abilities (COD), and sprint performance on professional female soccer players, with only one session of plyometrics performed per week. The length of the program was supported by evidence gathered from other sources which identified twelve weeks as an ideal amount of time to see benefits from a plyometric program. It was hypothesized by the researchers that incorporating

even only one session of plyometrics per week in the training programs of these athletes would improve fitness performance indicators of speed, agility, and power.

In order to carry out this study, the researchers used a randomized controlled group trial design, with players on one team being randomly assigned to either the plyometric group (PLY) or the control group (CON). Each group had eight players, though one dropped out of the CON group due to an injury. In order to establish a baseline of power, COD and sprint performance, tests were performed prior to the initiation of the intervention. To measure for jump height, squat jump and countermovement jump tests were performed, while power was measured by a standing long jump test. Rebounding jump ability – which is highly important yet rarely tested for athletes – was measured by a single-leg triple jump test with both the dominant and non-dominant limbs. Each jumping test was repeated three times. To measure COD ability, the 505-COD test was utilized, with 10 and 30 meter sprint tests were performed to measure linear sprint performance. All players were asked to maintain normal nutritional intake throughout the duration of the study, and neither caffeine or alcohol was to be ingested within twenty-four hours of testing sessions.

Training sessions throughout the intervention were performed once a week, as mentioned above. While the PLY group performed the intervention program, the CON group underwent a recovery session which included dynamic stretching and balance exercises. After completion of the study, all baseline tests were repeated in order to gather data on the efficacy of the intervention. Though most tests did not show significant improvements, there were significant within-group differences in the triple-jump test and 10-meter sprint test. These were regarded as meaningful by the researchers due to the results being greater than the smallest worthwhile change (SWC) in both tests. In addition, small differences in the 30-meter sprint test were found in the PLY group, and according to the authors, “should be considered as *likely* beneficial (because of the small sample involved)” (p. 1049). Even though there are difficulties in obtaining meaningful data in-season (due to the time constraints of training reported above), the findings of the current study were still regarded to have a “strong practical application” (p. 1049) due to the intervention significantly increasing certain parameters of fitness in athletes.

Plyometric training has been demonstrated to confer a myriad of beneficial physical adaptations for athletes, ranging from improved vertical jump performance to increased sprint speed and even to injury prevention. The results of this study show that plyometrics can be utilized in-season (or any other period

when training time is at a premium) at a frequency of even once per week to not only maintain certain measures of power, COD, and sprint performance, but to even increase these essential fitness capabilities. This is a key practical insight for practitioners working with not only in-season sport athletes, but others such as tactical athletes whose training time can be limited by various work, technical training, and travel time constraints.

Reference

Nonnato, A., Hulton, A. T., Brownlee, T. E., & Beato, M. (2022). The Effect of a Single Session of Plyometric Training Per Week on Fitness Parameters in Professional Female Soccer Players: A Randomized Controlled Trial. *Journal of strength and conditioning research*, 36(4), 1046–1052.