

Abstract

Postactivation potentiation is a physiological concept that implies that a conditioning activity can enhance the outcome of a subsequent task. These tasks are normally power related activities like maximal sprinting or jumping. This study explored whether postactivation potentiation could be achieved in healthy adults using a bodyweight conditioning activity. Three original studies were conducted as part of this thesis. The researchers conducted study one and two to investigate whether a maximal intensity body-weight task could induce postactivation potentiation in a similar subsequent task. A randomised controlled trial was conducted in each case. The researchers used study three to investigate whether a body weight conditioning activity could improve the outcome of a subsequent task. A systematic review and meta-analysis were conducted which included the results of study one and two. Study one demonstrated that relative to the baseline there was a significant improvement in the maximal linear sprint group over 10 m and 20 m at two minutes of 0.12 m.s^{-1} and 0.11 m.s^{-1} and at six minutes of 0.11 m.s^{-1} and 0.12 m.s^{-1} respectively. There was also a significant improvement in the control group between two and six minutes post-intervention at 10 m and 20 m of 0.06 m.s^{-1} and 0.08 m.s^{-1} respectively. There was no significant difference between the intervention and control group. Based upon this finding a maximal sprint acceleration may enhance the outcome of a subsequent maximal sprint acceleration. The researchers demonstrated in study two that relative to the baseline there was a significant improvement in the maximal vertical jump group in jump height (1.89 cm) and power output (114.45 W) at two minutes. There was no change in control group across the experiment and no significant difference between the control group and the intervention group. These findings suggest that two maximal vertical jumps may enhance the outcome of a subsequent maximal vertical jump after two minutes. However, these enhancements were not sustained for a further four minutes. Study three demonstrated that there was a small overall effect of 0.30 (95% CI 0.14 to 0.46, $p = 0.0003$) in favour of using a bodyweight conditioning activity to improve the outcome of a subsequent vertical jump or linear sprint. The interpretation of these outcomes indicates that while the enhancement may be small to moderate in effect, they are in favour of using bodyweight conditioning activities to enhance the outcomes of a maximal vertical jump or maximal sprint. Vertical jump and sprint ability are highly associated with performance outcomes in many sports. Bodyweight conditioning activities allow for a simple, yet effective approach with minimal adverse consequences to achieve postactivation potentiation and an enhanced state of performance prior to participation in a 'real world' environment.