Validity and Utility of Smudge.io's CNS Tap Test for Measuring Fatigue in Adolescent Athletes

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High school athletes account for approximately two million injuries each year, suggesting that training loads are too intense. Finding an optimal method to monitor fatigue accurately, affordably, and conveniently can minimize injury risk by providing a better understanding of appropriate training amounts. This study investigated the validity of Smudge.io's Central Nervous System (CNS) Tap Test to measure fatigue in adolescent athletes compared to a validated countermovement jump (CMJ) test to obtain a more practical tool for high schools. Fatigue levels were measured from adolescent athletes (n=41) over a two-month period throughout their sports season. Athletes participated four times, each time performing the CMJ test, Smudge.io's CNS Tap Test, and self-reporting their fatigue through a Wellness Questionnaire. A Pearson correlation run to determine the efficacy of the CNS Tap Test showed no significant relationship between the controlled countermovement jump data and the tap data ($r=0.23$, $p>.05$). There was also no significant correlation found between mean jump height and self-reported fatigue levels via the Wellness Questionnaire ($r=-.06$, $p>.05$). These results suggest that Smudge.io's CNS Tap Test and self-reports of fatigue are not reliable tools when implemented in an adolescent athlete cohort. This illustrates the need for more reliable methods for measuring fatigue in young athletes. This will provide guidance for the development of more accurate training loads that will reduce sport-related injuries in the adolescent athlete.

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