

Are Low-Demand Tasks Appropriate for Comprehensive Movement Pattern Evaluation and Injury Risk Prediction?

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Editorial

A fundamental movement pattern is a basic movement which simultaneously requires muscle strength, flexibility, range of motion, coordination, balance, and proprioception [1-3]. Movement evaluation screen tests, which involve comprehensive movement pattern identification of injury risk among athletes, have been widely used in sport practice [3,4]. It was reported that dysfunctional movement patterns create tissue stress, and when the applied load exceeds its tolerance, it may lead to acute and chronic injury [5,6].

However, some authors have suggested that deficits in joint mobility and stability may impact an individual's movement patterns [2,3], but it should be noted that the test scores are also influenced by other factors [4,7]. It was reported that the final score of the movement evaluation test is also affected by athletes' prior experience, understanding of the task, motivation and awareness of the grading criteria [4]. Therefore, someone's movement patterns may not be only a direct result of a specific dysfunction or impairment.

Many of the movement screens used only body mass patterns, and athletes are instructed to perform it slowly, with control. It was suggested that if the aim of the test is to predict athletes' injury risk or make some recommendations for training, it may be more appropriate to test their habitual movements than those recommended in movement screen tests [4,7].

Important issues that should also be considered during the movement pattern evaluation of an athlete are movement variability and movement coordination. Hamill et al. [8] have reported that healthy individuals who have more combinations of intra-segment coordination have higher coordinative variability and functional systems use all degrees of freedom effectively in order to optimise task performance. However, in an injured individual, the number of combinations may be reduced, decreasing the coordinative variability. It was reported that a lack of movement variability may be indicative of dysfunction, frailty or disease [9-11]. It was suggested that there is a threshold of coordinative variability below which an athlete would be injured, and moreover, they underlined that changes in coordinative variability may be clinically used to track recovery [8].

Movement strategy may be also altered in response to an increased or decreased task demand [7,12]. Frost et al. [7] examined the impact of load and speed on individuals' movement behaviour and reported that the participants changed it in response to the external demands of a task by the adoption of a safer and more effective pattern. It was suggested that movement evaluation based on low-demand tasks used

to predict an athlete's movement competency, may not be appropriate when the demands are elevated [7]. Therefore, it may not be appropriate to assess lifting-related athlete's risk of injury using an unloaded movement task.

Moreover, Tsang et al. [12] have reported a limited value of assessing movement patterns at a slow or at self-preferred speed. They suggested that the wider range of speeds may lead to a better understanding of the movement dysfunction [12].

Based on those observations, it appears that if an athlete is able to perform a low-demand activity with competence, it does not mean that s/he will also be appropriately prepared to perform this activity safely or effectively when a task's demands are increased.

We concluded that movement pattern evaluations based only on low-demand activities may not adequately reflect an athlete's risk of injury, and could adversely affect training recommendations resulting from the screening test.

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