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Functional Movement Tests: Nuanced Reliability, Limited Prediction

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Introduction

Functional movement assessments play a vital role in understanding an individual's physical capabilities and limitations, particularly in clinical and athletic settings. These tools are designed to evaluate movement patterns, identify asymmetries, and potentially predict future risks like injury or poor performance. The underlying premise is that fundamental movement patterns are indicative of overall physical health and efficiency. However, the efficacy, reliability, and predictive validity of these assessments are subjects of ongoing research and debate. This collection of studies explores various functional movement screens and balance tests, shedding light on their practical applications, limitations, and the critical considerations for practitioners.

A key article rigorously examines the Functional Movement Screen (FMS), scrutinizing its consistency and precision. This review found that while the FMS is generally reliable when different individuals administer and score it, its predictive power for future injuries or athletic performance is not as robust as often assumed. This means that professionals should carefully weigh the implications of FMS scores when forecasting specific outcomes [1].

Expanding on the FMS's predictive capacity, several systematic reviews and prospective studies have delved into its ability to forecast injury risk across diverse populations. One comprehensive systematic review and meta-analysis specifically investigated the FMS's effectiveness in predicting injuries among athletes. The overall finding was that despite the widespread use of FMS, its injury predictive capability remains quite limited. This highlights a need to consider broader, multi-faceted approaches to injury prevention beyond solely relying on FMS scores [2]. This perspective is further supported by a prospective study involving youth football players. It found that while lower FMS scores correlated with a higher injury risk, the screen was not an infallible predictor on its own. This underscores that injury susceptibility in young athletes is influenced by numerous factors, not just observed movement patterns [3].

Similarly, in more specialized populations, the predictive validity of the FMS for injury risk has been scrutinized. A systematic review focusing on military personnel revealed that while some correlation exists between FMS scores and injury incidence, the overall predictive strength for preventing injuries in this group is restricted. This implies that a comprehensive injury prevention strategy in military contexts likely requires more than just FMS [7]. The relationship between FMS and golf performance, including injury risk, in golfers also underwent a systematic review. This research pointed out that while FMS can identify certain movement limitations, its direct link to golf swing characteristics or injury prediction in golfers is not consistently strong. Practitioners in golf are therefore advised to view FMS as one component of a broader assessment [8].

Beyond injury prediction, the association between FMS scores and physical performance metrics has also been explored. A study on young elite soccer players investigated these relationships, discovering that while certain FMS scores showed mild connections to performance measures like jumping and sprinting, the FMS did not powerfully predict overall athletic performance. This reinforces the idea that FMS is merely one piece of the puzzle when evaluating young athletes, not the complete picture [6].

Other functional movement assessments offer unique insights. For instance, the Star Excursion Balance Test (SEBT) has been thoroughly examined in healthy individuals, with a systematic review and meta-analysis highlighting subtle but consistent sex differences in performance. Recognizing these differences is crucial for accurate interpretation and individual comparisons [4]. Another systematic review focused on the Y-Balance Test Lower Quarter, assessing its reliability and validity in young and middle-aged adults. It clarified that while the test reliably measures performance, its clarity in predicting injuries or identifying functional deficits is often ambiguous. This suggests that practitioners should judiciously integrate the Y-Balance Test with other assessment methods [5].

Functional movement assessments are also adapted for specific demographic and clinical needs. For older adults, a scoping review revealed a diverse range of assessment tools and methods, emphasizing the necessity of customized approaches. A one-size-fits-all strategy is inadequate for addressing the distinct mobility challenges and goals inherent to this population [9]. Furthermore, these assessments are critical in guiding the rehabilitation process for athletes returning to sport, particularly after significant injuries like Anterior Cruciate Ligament (ACL) reconstruction. A systematic review confirmed the importance of these assessments in providing vital insights into movement quality and residual deficits, thereby aiding clinicians in making informed decisions about an athlete's readiness to return to play and helping to mitigate re-injury risk [10].

Description

The Functional Movement Screen (FMS) is a widely utilized tool, yet its overall efficacy remains a subject of considerable research. One comprehensive systematic review highlights that while the FMS itself shows general reliability across different scorers, its capacity to predict future injuries or enhance athletic performance isn't as strong as one might hope. This finding suggests a cautious approach is needed when using FMS for such specific outcomes [1].

Delving deeper into injury prediction, a systematic review and meta-analysis specifically assessed the FMS's predictive value for injuries in athletes. The conclusion here is clear: despite its popularity, the evidence indicates that the FMS has pretty limited power to predict injuries. This really pushes us to consider broader, more integrated injury prevention strategies beyond just FMS scores [2]. This sentiment is echoed by a prospective study on youth football players, where a lower FMS score did suggest a higher injury risk, but it wasn't a standalone perfect predictor. It emphasizes that injury susceptibility in young athletes is a complex interplay of various factors, not solely movement patterns [3]. Further, a systematic review on military personnel indicated that FMS scores show some correlation with injury incidence, but its overall predictive validity for preventing injuries in this population is limited, suggesting a more comprehensive approach is needed in military settings [7].

When considering athletic performance, another study investigated the associations between FMS scores and various physical performance measures in young elite soccer players. What emerged was that while some FMS scores had mild correlations with aspects like jumping and sprinting, the FMS didn't strongly predict overall athletic performance. This means FMS should be viewed as just one piece of the puzzle, not the definitive assessment, when evaluating young athletes [6]. Even in a niche sport like golf, a systematic review found that while FMS can pinpoint movement limitations, its direct link with golf swing characteristics or predicting injuries in golfers isn't consistently strong. This necessitates a nuanced perspective, integrating FMS as part of a larger assessment rather than the sole indicator for golfers [8].

Beyond the FMS, other functional movement assessments offer unique insights. For instance, the Star Excursion Balance Test (SEBT) was examined in a systematic review and meta-analysis specifically for healthy individuals, revealing subtle but consistent sex differences in performance. This information is vital for accurate interpretation of results and fair comparisons between individuals [4]. Similarly, the Y-Balance Test Lower Quarter has undergone scrutiny for its reliability and validity in young and middle-aged adults through a systematic review. This review clarified that while the test is quite consistent in its measurements, its ability to predict injuries or clearly assess functional deficits isn't always straightforward. Therefore, practitioners are advised to use it thoughtfully, integrating it with other assessment tools for a more complete picture [5].

The application of functional movement assessments also varies across different populations and clinical needs. For older adults, a scoping review revealed a diverse range of tools and approaches, highlighting the crucial need for tailored assessments. A generic approach simply doesn't meet the specific mobility challenges and goals unique to this demographic [9]. Crucially, these assessments prove invaluable in the return-to-sport process, especially following significant injuries like Anterior Cruciate Ligament (ACL) reconstruction. A systematic review underscored that these assessments are fundamental for guiding rehabilitation, empowering clinicians to make well-informed decisions about an athlete's readiness to return to play. They provide critical insights into movement quality and any remaining deficits, which in turn helps to significantly reduce the risk of re-injury [10].

Conclusion

Research on functional movement assessments, particularly the Functional Movement Screen (FMS), consistently points to nuanced findings regarding its reliability and predictive validity. While FMS demonstrates general reliability in scoring among different evaluators, its ability to accurately predict future injuries or athletic performance is often limited [1, 2]. For example, studies on youth football players indicated a higher injury risk with lower FMS scores, but it wasn't a perfect sole predictor, emphasizing the role of other factors [3]. Similarly, in elite young soccer players, FMS scores showed only mild associations with physical performance metrics like jumping and sprinting, suggesting it's just one component of a broader athletic assessment [6]. The predictive validity of FMS for injury risk also appears restricted in specific populations, including military personnel and golfers, where it identifies some movement limitations but doesn't consistently correlate with injury incidence or performance characteristics [7, 8]. Beyond FMS, other balance tests like the Star Excursion Balance Test (SEBT) show consistent sex differences in performance in healthy individuals [4]. The Y-Balance Test Lower Quarter, while reliable for measurement, also has unclear validity for injury prediction or functional deficit assessment, prompting practitioners to use it thoughtfully alongside other tools [5]. Generally, functional movement assessments are recognized as crucial for guiding rehabilitation, especially in contexts like return to sport after Anterior Cruciate Ligament (ACL) reconstruction, providing insights into movement quality and deficits to reduce re-injury risk [10]. However, for older adults, the assessment landscape is diverse, stressing the need for tailored approaches that address their unique mobility needs [9]. Overall, the consensus suggests functional movement screens are valuable as part of a comprehensive assessment strategy, rather than as standalone definitive predictors.

Acknowledgement

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Conflict of Interest

None.

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