

THE FUNCTIONAL MOVEMENT SCREEN IN THE PREDICTION OF INJURY IN ADOLESCENT CRICKET PACE BOWLERS: AN OBSERVATIONAL STUDY



Candice Martin, Benita Olivier, Natalie Benjamin.
Physiotherapy Department, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa.



INTRODUCTION

Young fast bowlers of all ages remain at greatest risk sustaining injury.¹ Although considered predominantly a non-contact sport, collision with the ball, another player, boundary rope, or ground also predispose cricketers to contact injuries.² Young cricketers sustain proportionally less overuse injuries than elite players and are more susceptible to acute traumatic injuries.¹ Poor dynamic balance and asymmetrical strength and flexibility resulting in poor fundamental movement patterns, essential for complex athletic movements such as the bowling action, have been associated with increased risk for injury among athletes.³ The Functional Movement Screen (FMS) has been developed as a comprehensive, pre-participation tool to screen the quality of any athlete's fundamental movement patterns, identify limitations and asymmetries and establish the athlete's risk for sustaining an injury.³ The tool comprise of 7 tests (deep squat, hurdle step, in-line lunge, shoulder mobility test, active straight leg raise, trunk stability push-up and rotary stability test) and three clearing tests.⁴ Higher scores indicate lower injury risk.⁴ Scores of 14 or less have been found to positively predict serious injury among American football players,³ female college athletes,⁵ and high school basketball athletes.⁶ If found a valid predictor of cricket pace bowler injuries, health and fitness professionals could identify players at risk of in-season injuries and address possible preventable causes.

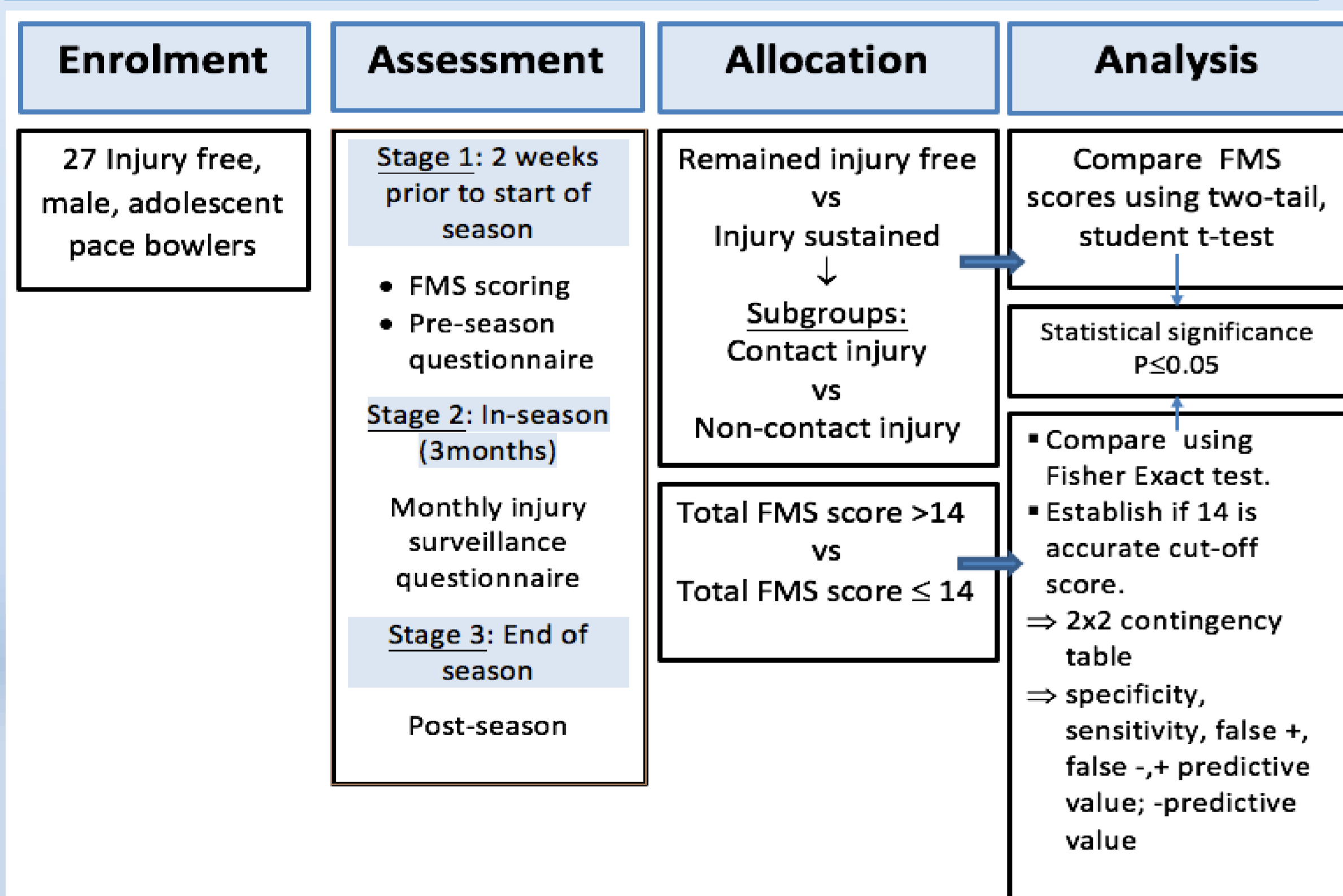
AIM

To determine if a pre-season FMS total score is a valid predictor of in-season injury among adolescent pace bowlers.

METHODS

This was a retrospective observational quantitative study

An injury was defined as injury of any body region, sustained while participating in a sporting activity, that resulted in loss of at least one day of training or play OR that occurred during a sporting activity that required medical attention. All bowlers were injury free at the start of the cricket season. Ethical clearance was obtained from the Human Research Ethics Committee of the University of the Witwatersrand (M130657).



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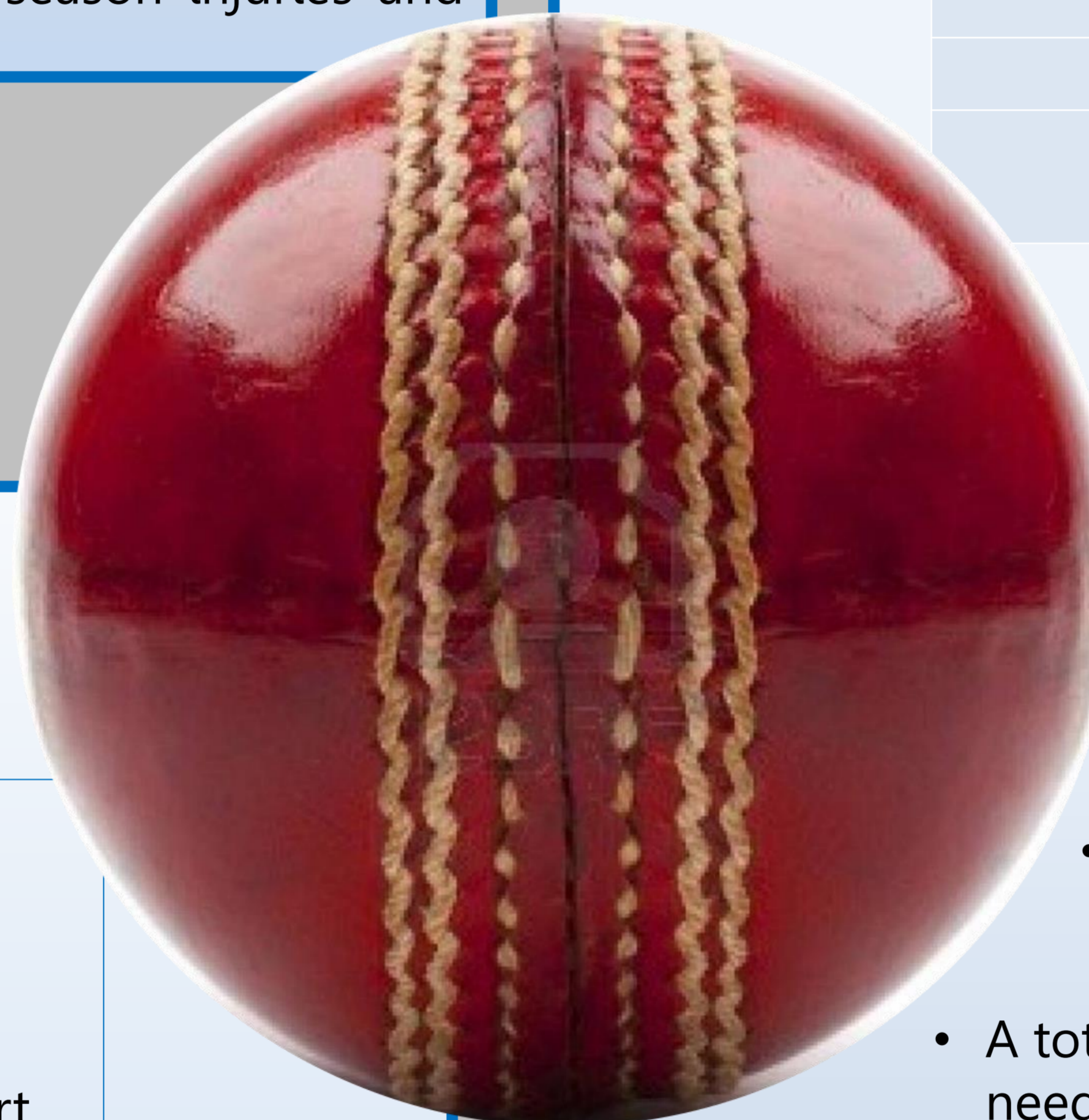
RESULTS

Table 1: Mean (\pm SD) total FMS score of injured and non-injured bowlers.

	Non-Injured	Injured	P-value	Contact	Non-contact	P-value
	(n=17)	(n=10)		(n=5)	(n=5)	
Total FMS score	16.65 (\pm 2.57)	16.10 (\pm 2.07)	0.58	15.80 (\pm 2.17)	16.40 (\pm 2.41)	0.77

Table 2: 2x2 contingency table for injured vs non-injured players that scored ≤ 14 and > 14 .

		INJURED		P-value	Total
		No	Yes		
Total FMS score	≤ 14	6 (35%)	2 (20%)	1.00	8
	> 14	11 (65%)	8 (80%)		19
Total		17	10		27
		Sensitivity	0.2	Specificity	0.65
		False + rate	22.2%	False - rate	29.6%
		+ Predictive value	25.0%	- Predictive value	57.9%



Summary of results:

- There were no significant differences in any of the demographic or anthropometric variables (height, weight and BMI) between the two groups.
- No significant difference in total FMS score between injured vs non-injured bowlers or bowlers that sustained contact vs non-contact injuries
- No significant difference between injured bowlers that scored ≤ 14 and injured bowlers that scored > 14 .
- A total FMS score of 14 does not provide the sensitivity needed to assess injury risk among adolescent pace bowlers and no other accurate cut-off score could be calculated.
- The OR for an uninjured bowler to score ≤ 14 versus an injured bowler to score ≤ 14 , was 2.18 ≈ 2 . indicating that uninjured bowlers were 2.18 times more likely than injured bowlers to score ≤ 14 . The odds ratio is not statistically significant.

CONCLUSIONS

The FMS was designed to identify faulty movement patterns, in terms of asymmetries and limitations that have been changed as a result of previous injury or pain. One can therefore derive that it was designed to predict non-contact injuries as movement patterns are independent of contact. However, considering the research findings of the studies that only included non-contact injuries^{6,7} the predictive validity for injury of the tool seems poor.

In studies where both contact and non-contact injuries were considered, there seems to be an association between injury risk and FMS total score. One could therefore hypothesise that, in addition to other factors, correct and untainted movement patterns might help an athlete to avoid contact. For this reason, both contact and non-contact injuries were included in this study. Nevertheless, considering the findings it can be concluded that the FMS is not a good predictor of any injury among adolescent pace bowlers.

Further studies could be conducted to determine if a specific FMS test or asymmetries in movement patterns are more predictive of injury among pace bowlers. Research into the role of neuromuscular control and symmetry in the avoidance of contact injuries should be conducted.

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