

Compensatory Movement Patterns of Agility and Non-Agility Sport Athletes

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Introduction

- Compensatory movements, such as knee valgus and core instability, are risk factors for both patellofemoral syndrome and non-contact anterior cruciate ligament (ACL) injuries.²
- Patellofemoral syndrome is common in female non-agility sport athletes, such as cross country (CC) runners.⁵
- Non-contact ACL injuries are common in female agility sport athletes, such as volleyball (VB), basketball (BB), and soccer (SC) players.³
- No research to this point has compared agility and non-agility sport athletes' relative risk for injury based on the presence of compensatory movement patterns.

Purpose

- The purpose of this study was to compare the compensatory movement patterns of agility sport athletes to non-agility sport athletes.

Materials

Participants:

- Total of 76 division III female athletes; 52 agility sport athletes [VB $n = 20$, SC $n = 24$, and BB $n = 8$] and 24 non-agility sport athletes [CC $n = 24$].

Landing Error Scoring System (LESS):

- Athletes were videotaped performing three box drop vertical jump (BDVJ) test trials from a 30cm platform.
- The video image of the jump producing the greatest vertical displacement for each athlete was scored using the 17 item LESS, and a Composite LESS score was calculated (maximum possible score = 19).

- Based on Composite LESS scores, each athlete was assigned a LESS Relative Risk classification: 0 = excellent ($LESS \leq 4$), 1 = good ($4 < LESS \leq 5$), 2 = moderate ($5 < LESS \leq 6$), or 3 = poor ($LESS > 6$).²

Functional Movement Screen (FMS):

- Athletes performed seven separate compensatory movement tests with each test scored (using published criteria, a Composite FMS score was calculated (maximum possible score = 21).
- Based on Composite FMS scores, each athlete was classified as either 1= high risk of injury (FMS score < 14) or 0 = low risk of injury (FMS score > 14).⁴

Results

Table 1. Independent *t*-test comparing scores of agility athletes to non-agility athletes.

	Agility Athletes (Mean \pm SD)	Non-Agility Athletes (Mean \pm SD)	<i>p</i> values
FMS™ Composite	15.1 \pm 2.10	15.3 \pm 1.37	0.53
FMS™ Relative Risk	0.40 \pm 0.495	0.25 \pm 0.442	0.18
LESS Composite (Left Leg)	5.63 \pm 1.59	5.25 \pm 1.73	0.34
LESS Relative Risk (Left Leg)	1.50 \pm 1.08	1.46 \pm 1.18	0.88
LESS Composite (Right Leg)	5.69 \pm 1.59	5.50 \pm 1.72	0.63
LESS Relative Risk (Right Leg)	1.56 \pm 1.09	1.58 \pm 1.10	0.93



Figure 1. Starting position for BDVJ test.

Discussion

- Non-significant differences were found in LESS Composite scores, LESS Risk classification, FMS™ Composite scores, or FMS™ Risk classification between the athletes participating in agility sports compared to non-agility sports.

- While the mean FMS Composite scores were greater than 14 for both groups, 11 agility and 2 non-agility sport athletes scored below 14 indicating 4-fold increase in risk of lower extremity injury for those athlete.¹

Implications

- Trainers and health professionals involved in the care of female athletes should understand the physical nature of the athlete is not the only risk factor of getting injured in a sport. The nature of the sport is a large component of what type of injuries the athlete could possibly sustain.

Future Research

- Future research should examine the relative effectiveness of the FMS™ and LESS in predicting athletic injuries.

Conclusion

- Athletes from agility and non-agility sports have similar movement characteristics and injury risk based on FMS™ and LESS scores.

References

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