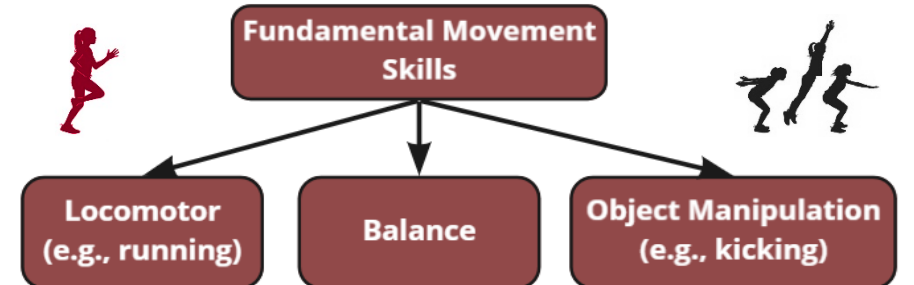
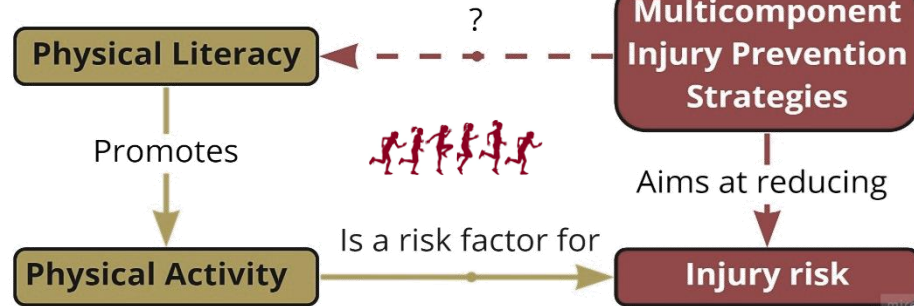


Effects of Multicomponent Injury Prevention Strategies on the Biomechanics and Neuromuscular Performance of Fundamental Movement Skills in Children and Adolescents

BACKGROUND



- Understanding the overall effect of **multicomponent injury prevention strategies** on **fundamental movement skills** (widely used in physical literacy) may help to promote **physical activity** safely.

OBJECTIVE

- This systematic review with meta-analyses aims to summarize the evidence on the effects of **multicomponent injury prevention strategies** on the biomechanics and neuromuscular performance of **fundamental movement skills** in children and adolescents.

METHODS

- We conducted a systematic search of four databases (PubMed, SPORTDiscus, Web of Science, SCOPUS).
- We included RCTs analyzing the effects of **multicomponent injury prevention strategies** in participants younger than 18 years of age.
- We evaluated eligibility and methodological quality and extracted means and SDs for each outcome.
- We used the inverse-variance random-effects model for the statistical analyses.

RESULTS

Figure 1. Pooled effect sizes from random effects meta-analyses

Subgroup Dribbling
Random effects model
 $\chi^2_4 = 15.3$ ($P = .004$), $I^2 = 74%$ [35%; 89%]

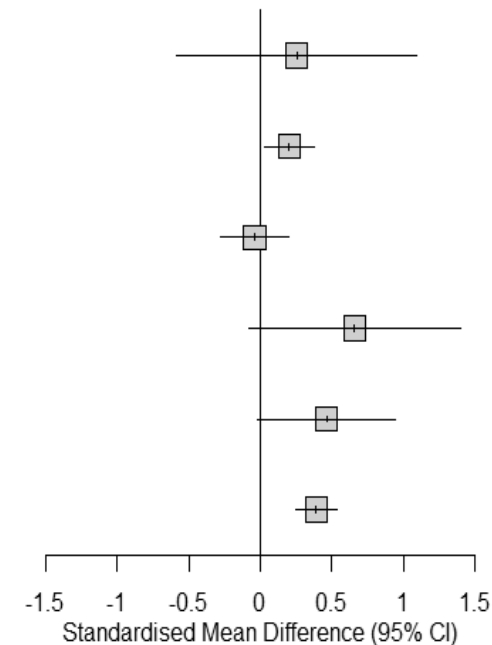
Dynamic Balance
Random effects model
 $\chi^2_9 = 7.17$ ($P = .62$), $I^2 = 0%$ [0%; 53%]

Horizontal jump
Random effects model
 $\chi^2_8 = 4.83$ ($P = .57$), $I^2 = 0%$ [0%; 64%]

Running - Acceleration
Random effects model
 $\chi^2_7 = 45.16$ ($P < .001$), $I^2 = 84%$ [71%; 92%]

Running - Speed
Random effects model
 $\chi^2_{10} = 40.53$ ($P < .001$), $I^2 = 75%$ [55%; 86%]

Vertical jump
Random effects model
 $\chi^2_{17} = 14.08$ ($P = .66$), $I^2 = 0%$ [0%; 40%]



DEMOGRAPHICS

- Participants 1404 (834 females), allocation (734 intervention), participants over 14yo (648), study sex (26 total, 11 female, 2 mixed).

Table 1. Studies' Characteristics

		%
Included Studies (n)	26	100
Duration (weeks)	6-10	61.5
Times per week	2-3	88.5
Sessions (n)	11-30	65.4
Session (min)	16-20	57.7
Sport	Soccer	65.4
Intervention	FIFA	7.4
	FIFA 11+	33.3
	FIFA 11+	11.1
	NMT	22.2
	ACL-IPP	11.1
	Std. IPP	14.8

CONCLUSIONS

- Multicomponent injury prevention strategies** positively influenced specific biomechanical outcomes and neuromuscular performance measured on **fundamental movement skills** in children and adolescents.
- Properly designed **multicomponent injury prevention strategies** lasting between 15 and 20 minutes per session and implemented two to three times per week are a suitable warm-up for **physical literacy** interventions and organized **physical activity**.
- Multicomponent injury prevention strategies** lead to functional adaptations that may reduce biomechanical risk factors for injury and improve neuromuscular performance of **fundamental movement skills**.

RELEVANCE

- Including **multicomponent injury prevention strategies** in different contexts (e.g., physical literacy, physical education) may help to promote **physical activity** safely.

FUTURE RESEARCH

- Future research should further investigate the implementation of **multicomponent injury prevention strategies** outside sport-related contexts.

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