Sport Sampling Improves Physical Literacy Competency and Movement Quality Associated with Injury Risk

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OBJECTIVES

- Children need to stay free from injury and develop physical literacy in order to be physically active.
- Poor movement quality during sport-specific tasks is associated with lower extremity injury risk.[1]
- Objective: To evaluate the influence of sport specialization and sport sampling on injury risk and physical literacy competency in children.
- Hypothesis: Children who sport specialize and have not participated in multiple sports will demonstrate impaired movement and lower competency compared to children that sport sample.

Physical Literacy Assessment in Youth (PLAY*fun*): Movement Competency Tasks

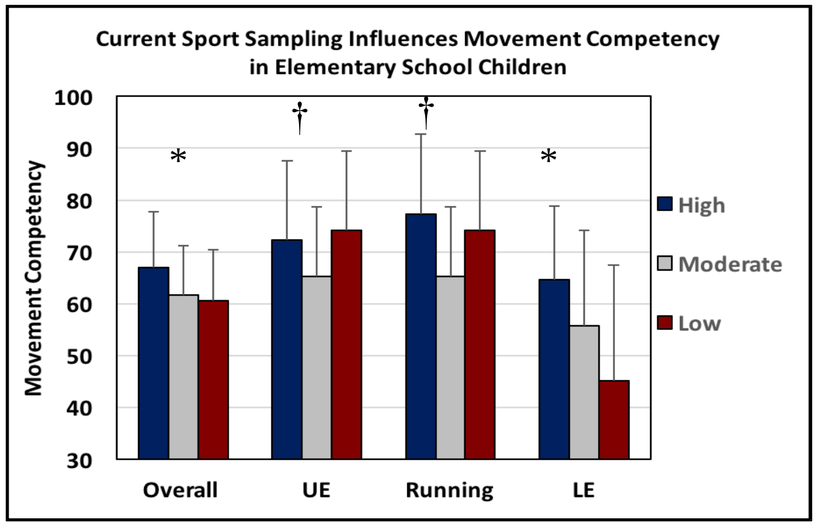
Figure 1. Representative images of the movement competency testing categories. Balance: Forward walk, backward walk, lift and lower, drop & get up (A). Running: Run around a square, run there and back, run and jump (B). Locomotor: hop, skip, jump, gallop, carioca (C). Lower extremity object control: Dribble, kick (D). Upper extremity object control: Overhead throw, one-handed catch, strike with a stick, dribble (E).

METHODS

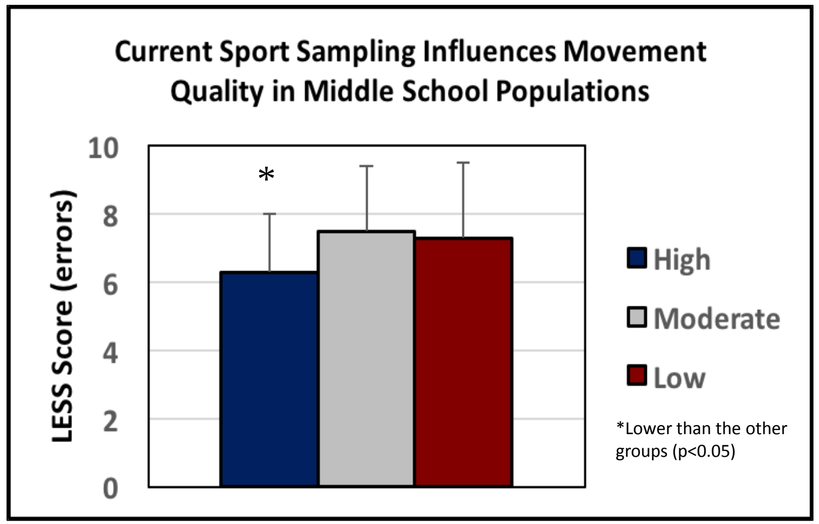
- Children from schools and sport organizations (ages 6-14 years) volunteered to participate in a single test session and completed a questionnaire regarding previous sport participation.
- Participants performed three trials of a standardized jump landing task, which was evaluated using the Landing Error Scoring System using an automated method (PhysiMax Technologies).
- Physical literacy competency was evaluated using the PlayFun tool.[2] (Figure 1)
  - Each task was scored using a 0-100 continuous scale, which was averaged within each domain, and across all tasks for a total score.
- Participants were classified into sport specialization categories using the scale by Jayanthi et al.
  - High: 3 points, Moderate: 2 points, Low: 1 point, No: 0 points
- Participants were classified into sampling groups based on:
  - Previous sport sampling[3]:
    - Low: <3 sports, Moderate: 3-5, High: >5
  - Current sport sampling
    - Low: <2 sports, Moderate: 2-3, High: >3
- Separate multivariate or univariate analyses of variance evaluated differences between sport specialization, and sampling groups for the competency outcomes and LESS scores, respectively, for elementary (grades K-4; n=76) and middle school (grades 5-8; n=98) children ($\alpha \geq 0.05$).

RESULTS

- Sport specialization did not impact any variable (P>0.05).
- Previous sport sampling influenced competency in the following domains in elementary school-aged participants:
  - Running (P=0.006; High: 80.7±12.1 points, Moderate: 66.9±15.9, Low: 74.1±14.7)
  - UE (P=0.01; High: 67.9±15.2 points, Moderate: 69.4±15.4, Low: 56.4±19.7)
  - LE (P=0.002; High: 64.0±13.3, Moderate: 57.8±18.6, Low: 43.8±22.8)
- Current sport sampling affected competency in overall (P=0.05), LE (P=0.001), UE (P=0.005), and Running (P=0.03) domains in elementary (Figure 2).
- Current sport sampling affected LESS scores (P=0.05) and locomotor competency (P=0.001; Low: 68.9±10.8; Moderate: 77.9±11.8; High: 78.5±10.7) in middle school (Figure 3).



*High > Low, moderate
† Moderate < High, low (p<0.05)



*Lower than the other groups (p<0.05)

CONCLUSIONS

- Sport specialization did not affect physical literacy competency or movements associated with injury risk in children.
- However, sport sampling improves several measures of physical literacy competency and movement quality, and supports previous literature.[3]
- This study only evaluated children before high school. The impact of sport specialization and sport sampling on movement competency and quality in adolescent athletes is unknown.
- The volume of sport sampling was not evaluated and should be considered.
- Children should be encouraged to participate in multiple sports throughout childhood to optimize safe long-term physical activity involvement.

References

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