

INTRODUCTION

Quality of motion and neuromuscular balance are noted predictors of acute and chronic injury risk. Early sports specialization and excessive activity levels have been linked to high risk of injury as well. However, no study to date has determined if sports specialization, quality of motion, and quantity of physical activity are related. The purpose of this study is to investigate for any relationships between quality of physical movement, quantity of physical activity, and degree of sports specialization in a healthy cohort of children and adolescents.

METHODS

Participants completed the HSS Pedi-FABS¹ to assess quantity of physical activity and the Jayanthi scale² to assess degree of sports specialization. Quality of motion was measured by assessing tibial translation using motion analysis sensors (DorsaVi, Kew, Australia)³ during 5 repetitions of 4 different jumping and squatting motions. Specialization level was dichotomized as low specialization with a score of 0 or 1 and high specialization with a score of 2 or 3 on the Jayanthi sports specialization scale. Tibial translation for each repetition on each leg was scored with 2 points for translation less than 5 degrees, 1 point between 5 and 9 degrees, and no points for greater than 9 degrees for a maximum overall score of 100.

RESULTS

Variables	N (%)	M ± SD
Sex		
Male	32 (50%)	
Female	32 (50%)	
Age		12.1 ± 1.6
HSS Pedi-FABS		19.4 ± 7.3
Quality of Motion Score		26.4 ± 12.1
Jayanthi Scale		
Low Specialization (0-1)	32 (50%)	
High Specialization (2-3)	32 (50%)	

There were no differences between high and low specialization on quality of motion, but highly specialized participants had significantly higher activity levels (HSS Pedi-FABS scores of 21.4±6.8 vs. 17.3±7.2, p<.05). Additionally, there was no correlation between quantity of physical activity and quality of motion.

Quantity of Physical Activity: HSS Pedi-FABS

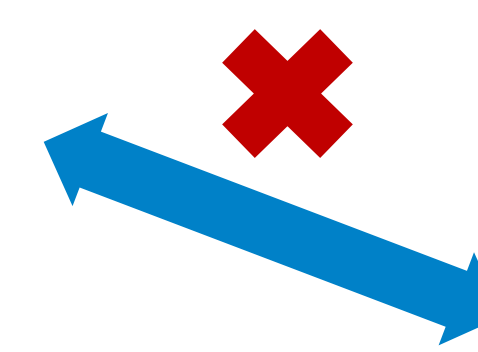
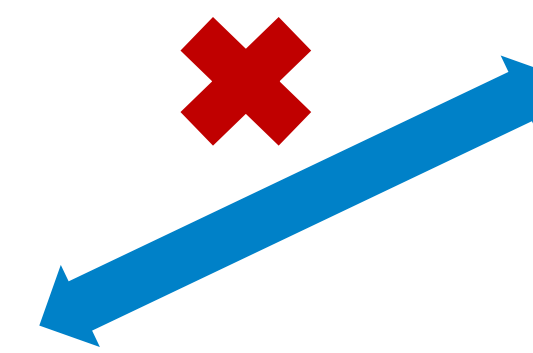
Instructions: Choose one answer for each activity or question. In the grid, please indicate how often you performed each activity in your healthiest and most active condition. IN THE PAST MONTH.

	Less than one time per month	One time per month	One time per week	2-3 times per week	More than 4 times per week
Running: running while playing a sport or jogging.					
Cutting: quickly changing directions while running.					
Decelerating: coming to a quick stop while running.					
Pivoting: turning your body with your foot planted (for example: skiing, skating, kicking, throwing, hitting a ball).					
Duration: perform athletic activity for as long as you would like to without stopping.					
Endurance: perform athletic activity for one whole hour without stopping.					

Competition: Do you participate in organized competitive sports or physical activities?
 No (or gym class only)
 Yes, but WITHOUT an official or judge (such as club or pickup games)
 Yes, WITH an official or judge
 Yes, at a national or professional level

Supervision: Do you participate in supervised (coach, trainer, instructor) sports practice or activities (other than gym class)?
 No
 Yes, 1-2 times per week
 Yes, 3-4 times per week
 Yes, 5 or more times per week

Quality of Motion: Dorsa Vi Tibial Motion Sensors



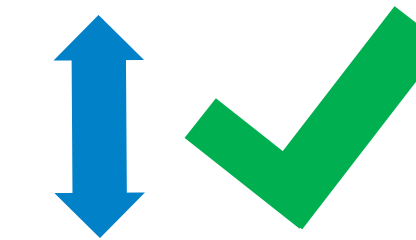
Sports Specialization: Jayanthi Scale⁴



Year round training/competition > 8 months

Choose a main sport

Quit all other sports to focus on one sport



CONCLUSION

Quality of motion as measured by tibial translation in jump-landing tasks in healthy children was poor overall and unrelated to degree of sports specialization or level of physical activity. Future studies should assess ways to improve quality of motion in all children, in order to decrease injury risk regardless of activity or sports specialization levels.

REFERENCES

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2. Jayanthi NA, LaBella CR, Fischer D, Pasulka J, Dugas LR. Sports-specialized intensive training and the risk of injury in young athletes: A clinical case-control study. Am J Sports Med. 2015;43(4):794-801.
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4. Teegardin C. Elite youth sports: Are they hurting our kids? The Atlanta Journal-Constitution. <https://www.ajc.com/blog/investigations/elite-youth-sports-are-they-hurting-our-kids/OtBUZHdXKWV21RANQwABIN/>. Published 2017. Accessed December 16, 2019.