



# Specialized Training Assessment in Youth Sports (S.T.A.Y.)

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# BACKGROUND



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# BACKGROUND

- Models for athlete development exist but are backed by little evidence <sup>3,4</sup>
- Sport specialization is a significant component of athlete development models

Brenner, J.  
DiFiori, J et al.



# BACKGROUND

- Specialization
  1. Chose a main sport
  2. Participate in one sport >8mo/yr
  3. Quit participation in other sports

Jayanthi et al.

# BACKGROUND

<b>Degree of Specialization</b>	
Low specialization (0 or 1 of the following): Year-round training (>8 months per year) Chooses a single main sport Quit all sports to focus on 1 sport	
Moderately specialized (2 of the following): Year-round training (>8 months per year) Chooses a single main sport Quit all sports to focus on 1 sport	
Highly specialized (3/3 of the following): Year round training (>8 months per year) Chooses a single main sport Quit all sports to focus on 1 sport	

Jayanthi et al.

# BACKGROUND

Degree of Specialization	Risk of Injury	Risk of Serious Overuse Injury	Risk of Acute Injury
Low specialization (0 or 1 of the following): Year-round training (>8 months per year) Chooses a single main sport Quit all sports to focus on 1 sport	Low	Low	Moderate
Moderately specialized (2 of the following): Year-round training (>8 months per year) Chooses a single main sport Quit all sports to focus on 1 sport	Moderate	Moderate	Low
Highly specialized (3/3 of the following): Year round training (>8 months per year) Chooses a single main sport Quit all sports to focus on 1 sport	High	High	Low

Jayanthi et al.



# OBJECTIVES

- Investigate the magnitude of youth sports specialization in a sport specific model
- Determine if the **degree of specialization** and **age of specialization** are independent risk factors for injury/illness and decreased HRQoL overall
- Determine sports-specific thresholds for optimum age and developmentally appropriate training and competition loads overall and based on sports-specific performance in young athletes.



# METHODOLOGY

- **Community-based** recruiting soccer and tennis players ages 8-16 years from multiple sites
- **Survey based** data collection via RedCap
- **Repeated cross section** analysis



# METHODOLOGY

- **Redcap** surveys:
  - HIPPA compliant electronic survey tool
  - Baseline and 12 month surveys
    - Athlete Development Survey
    - Promis49 Pediatric Profile v 2.0
  - 6 month
    - Injury/Illness log (Oslo Sports Trauma Research Center Survey)



# ENROLLMENT DATA

	Total	Tennis	Soccer	No Main Sport
Enrolled in Study	64	40	23	1
Completed Baseline	55	34	20	1
Completed PROMIS QoL	49	30	19	0

  

	Emory	Medstar	Northern	Nemours	Others
Completed Baseline surveys	44	5	1	1	4

# PERFORMANCE METRICS

<b>Soccer</b>	
Recreational	1 (5%)
Club	6 (30%)
Academy	9 (45%)
ODP	2 (10%)
National team	2 (10%)
<b>Tennis</b>	
Have USTA ranking	31/34 (91%)
Universal tennis ranking	29/34 (85%)

# SPECIALIZATION

	<b>Low (0-1/3)</b>	<b>Moderate (2/3)</b>	<b>High (3/3)</b>
Total	1 (2%)	12 (22%)	42 (76%)

	<b>Chose Main Sport</b>	<b>Compete <math>\geq</math>8 mo/yr</b>	<b>Quit Other Sports</b>
Total (% of total)	54 (98%)	43 (78%)	53 (96%)
Soccer (% of respective sport)	20 (100%)	17 (85%)	19 (95%)
Tennis (% of respective sport)	34 (100%)	26 (76%)	34 (100%)

# OTHER POTENTIAL SPECIALIZATION METRICS

	Total	Tennis	Soccer
Play other sports (% of total)	21 (38%)	17 (31%)	4 (7%)
Play no other sports (% of total)	33 (60)	17 (31%)	16 (29%)
Compete for their high school	18 (32%)	14 (25%)	4 (7%)

# TRAINING LOAD METRICS

Average	Combined
Months participating in main sport per year (range)	11.0 (6-12)
Hours participating in main sport per week (range)	9.3 (3-20)
Months off from main sport per year (range)	0.9 (0-4)
Days off from main sport per week (range)	2.14 (1-5)
Hours in PE class per week (range)	2.2 (0-8)
Hours of just for fun activity per week (range)	2.0 (0-10)



# TRAINING LOAD METRICS

Average	Combined	Tennis	Soccer	P Value
Months participating in main sport per year (range)	11.0 (6-12)	<b>11.3 (8-12)</b>	<b>10.4 (6-12)</b>	<b>&lt;.05</b>
Hours participating in main sport per week (range)	9.3 (3-20)	9.6 (3-20)	8.8 (4-14)	0.44
Months off from main sport per year (range)	0.9 (0-4)	<b>0.7 (0-4)</b>	<b>1.3 (0-4)</b>	<b>&lt;.05</b>
Days off from main sport per week (range)	2.14 (1-5)	2.25 (1-5)	2.0 (1-4)	.28

# INJURY VS. TRAINING LOADS IN SOCCER

Average	Injured	Uninjured	P value	Average	Injured	Uninjured	P value
Age at beginning sport	3.25	4.8	.008	Games in last 12 mo	41.4	27.0	.017
Age at first competition	3.75	5.7	.003	Hours of training within 48 hrs of comp.	1.9	2.3	0.407
Age when quit other sports	5.9	4.6	0.610				
Months spent participating per year	10.9	9.9	0.089	Gamers per month	4.4	4.8	.461
				Days OFF per week	1.6	2.3	0.107
Months OFF per year	1.0	1.7	0.121	Soccer spec. fitness hours per week	1.9	2.7	0.218
Training hours per week	10.1	8.2	0.09				

# INJURY VS. TRAINING LOADS IN TENNIS

Average	Injured	Uninjured	P value	Average	Injured	Uninjured	P value
Age at beginning sport	7.4	6.2	0.200	Tournaments in last 12 mo	10.8	11.4	0.809
Age at first competition	9.6	8.4	0.155	Hours of training within 48 hrs of comp.	3.2	3.4	0.755
Age when quit other sports	10.1	7.8	0.186				
Months spent participating per year	11.3	11.5	0.646	Tournaments per month	1.3	1.7	0.126
				Days OFF per week	1.6	2.3	0.107
Months OFF per year	0.583	0.611	0.930	Tennis spec. fitness hours per week	2.3	3.1	0.447
Training hours per week	9.5	9.0	0.760				

# HEALTH RELATED QUALITY OF LIFE (PROMIS)

Averages	Pain interference	Depression/ Sadness	Peer Relationships	Anxiety/Fear	Mobility
Total	43.8	42.8	53.0	45.3	57.3

# HEALTH RELATED QUALITY OF LIFE (PROMIS)

Averages	Pain interference	Depression/ Sadness	Peer Relationships	Anxiety/Fear	Mobility
Total	43.8	42.8	53.0	45.3	57.3
Tennis	43.8	<b>44.6</b>	52.9	<b>49.0</b>	57.4
Soccer	43.7	<b>39.8</b>	53.3	<b>39.5</b>	57.0
P value	0.942	<b>0.047</b>	0.892	<b>0.0002</b>	0.767

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Total	43.8	42.8	53.0	45.3	57.3
Tennis	43.8	<b>44.6</b>	52.9	<b>49.0</b>	57.4
Soccer	43.7	<b>39.8</b>	53.3	<b>39.5</b>	57.0
P value	0.942	<b>0.047</b>	0.892	<b>0.0002</b>	0.767

# EFFECTS OF TRAINING LOAD AND SPECIALIZATION

## Soccer

Specialization	Injured	uninjured	total
Moderate	2	2	4
High	6	10	16
Total	8	12	20
P=0.65			

Specialization	HRQoL Diminished	HRQoL Within "Normal" Limits	total
Moderate	2	2	4
High	4	11	15
Total	6	13	19
P=0.37			

## Tennis

Specialization	Injured	uninjured	total
Moderate	3	5	8
High	14	13	27
Total	17	18	35
P=0.50			

Specialization	HRQoL Diminished	HRQoL Within "Normal" Limits	total
Moderate	2	6	8
High	12	10	22
Total	14	16	30
P=0.15			

Self rated performance (out of 10)	8.1 (6-10)
Self rated enjoyment of soccer (out of 10)	9.4 (6-10)
<b>Activity reduction due to injury over the past 6 months (number of athletes)</b>	
No reduction in activity	10
Minor reduction in activity	8
Moderate reduction	2
Major reduction	0
<b>reduction of performance due to injury over the last 7 days (number of athletes)</b>	
No effect on performance	13
Minor effect on performance	5
Moderate effect on performance	1
Major effect on performance	1
<b>Time Missed</b>	
Total time missed due to injury (days)	26
Average across all soccer players	1.13



# CONCLUSION

- Highly specialized sample, with potential sampling bias
- No correlation between specialization or training load and injury or HRQoL is seen at this point
  - Significantly higher enrolment will be needed to detect difference if it exists
- Tennis players trained/competed in significantly more months per year compared to soccer players,
  - suggesting possible off-season effect
- Injured soccer players have significantly lower average ages of initiation and higher cumulative competitions over the last year
- Total Quality of life is higher than general pediatric population
  - Tennis players report significantly higher levels of depression and anxiety compared to soccer players

# REFERENCES

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# THANK YOU!

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