Role of Sports Specialization on Overtraining, Burnout, and Mental Health Considerations

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Overview

• Benefits of sports on psychological health
  – Social
  – Cognition
  – Academics

• Impact of early sports specialization
  – Overtraining
  – Burnout
  – Mental health

• Positive paths forward
Benefits of Physical Activity and Sport
ACTIVE KIDS DO BETTER IN LIFE
WHAT THE RESEARCH SHOWS ON THE COMPOUNDING BENEFITS

ACTIVE PARENTS ASSOCIATED WITH ACTIVE KIDS

KIDS OF ACTIVE MOMS ARE 2X MORE LIKELY TO BE ACTIVE

INTERGENERATIONAL CYCLE

COMPRESSION OF MORBIDITY 1/3 THE RATE OF DISABILITY

EARLY CHILDHOOD   ADOLESCENCE   ADULTHOOD

PHYSICALLY ACTIVE CHILDREN

1/10 AS LIKELY TO BE OBSESE

UP TO 40% HIGHER TEST SCORES

LESS SMOKING, DRUG USE, PREGNANCY AND RISKY SEX

15% MORE LIKELY TO GO TO COLLEGE

7-8% HIGHER ANNUAL EARNINGS

LOWER HEALTH COSTS

MORE PRODUCTIVE AT WORK

REDUCED RISK OF HEART DISEASE, STROKE, CANCER, DIABETES

Aspen Institute: https://www.aspenprojectplay.org/the-facts/
Social and Psychological Benefits

Positive correlation between regular physical activity and mental health

Athletes less likely to engage in smoking compared to peers

Sports can improve overall personal development

Women’s Sports Foundation, 2014, 2018; GAO, 2012; McDowell, 2017
Cognitive Health Benefits

Organized sport activity associated with better cognitive skills and self-regulation in children (Piche, 2015)

More likely to attend college if participated in sport in high school (US Dept of Education, 2005)

Over 90% of surveyed female executives report playing organized sport (EY Women Athletes Business Network)
Physical Activity and Academic Behaviors

- Range of behaviors that may have an impact on the students academic performance

At-risk behavior
Organization
Attendance
Scheduling
Planning
Impulsive control

Sullivan, 2017
Sports Participation Positively Associated with

- Academic achievement in English
- Academic achievement in math
- Explained 7% of additional variance
- High School GPA

Fox, 2010; Dyer, 2017; Van Boekel, 2016
### Academic and Behavioral Performance

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower at-risk dropout</td>
<td>• Athletes 35.2% vs Non-Athletes 52.3%</td>
</tr>
<tr>
<td></td>
<td>• 6.8-18.3% risk reduction for dropping out among various ethnicities</td>
</tr>
<tr>
<td>Higher passing rates</td>
<td>• On all components: math, English, reading, writing, science, social studies</td>
</tr>
<tr>
<td></td>
<td>• 19.7-49.4% differences</td>
</tr>
<tr>
<td>Higher commendable rate</td>
<td>• 90th percentile</td>
</tr>
<tr>
<td></td>
<td>• 11.8-18.4% differences</td>
</tr>
<tr>
<td>Fewer disciplinary actions</td>
<td>• Athletes 0.85 vs Non-Athletes 1.23 / day</td>
</tr>
</tbody>
</table>

Eldridge, 2014
Quality of Life: Adolescent Athlete vs. Non-Athlete

SF-36 mental composite

- Physical functioning
- General health
- Social functioning
- Mental health

Snyder, 2010
Quality of Life: Adolescent Athlete vs. General Population

Total PedsQL

- Psychosocial summary
- Emotional functioning
- Social functioning
- School functioning

Lam, 2013
Early Sports Specialization

![Image of a woman holding an American flag on a soccer field]

**Ohio State Recruits by Urban Meyer**

- **Multi-Sport in High School**: 42
- **Football Only in High School**: 5

*Only play football? #WWUS*
Typical Aspects of Early Sports Specialization

- High volume, intensity, duration of training
- Highly structured, emphasis on physical development
- Minimal rest or time off
- May involve exclusion of other sports
- May be initiated by adults
- Goal of obtaining state or national status
National Athletic Trainers’ Association Position Statement: Prevention of Pediatric Overuse Injuries

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Delayed Specialization

1. Pediatric athletes should be encouraged to participate in multiple sports and recreational activities throughout the year to enhance general fitness and aid in motor development.$^5,^{13}$ Evidence Category: C

2. Pediatric athletes should take time off between sport seasons and 2 to 3 nonconsecutive months away from a specific sport if they participate in that sport year-round.$^{31}$ Evidence Category: C

3. Pediatric athletes who participate in simultaneous (eg, involvement in high school and club sports at the same time) or consecutive seasons of the same sport should follow the recommended guidelines with respect to the cumulative amount of time or pitches over the year.$^{31}$ Evidence Category: C
Health Impact of Sports Specialization

- Injury
- Psychological
- Overtraining
- Burnout
Sport specialization is associated with an increased risk of overuse musculoskeletal injuries (SORT grade: B)

Early Sport Specialization

Overuse Injury

HRQOL
Anxiety
Depression
Fear Avoidance

Early Sport Specialization

Overuse Injury

- HRQOL
- Anxiety
- Depression
- Fear Avoidance

Mental Health Considerations

Early Sport Specialization

- High training volume
- Year round participation

- Social isolation
- Poor academic performance
- ↑ Anxiety
- ↑ Stress
- Inadequate sleep
- ↓ Family time
- Burnout
<table>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Position on early sport specialization</td>
<td>Discouraged</td>
<td>Discouraged</td>
<td>Discouraged</td>
<td>Discouraged</td>
<td>Discouraged</td>
<td>Discouraged</td>
<td>Discouraged</td>
</tr>
<tr>
<td>Psychosocial and physical risks of early specialization</td>
<td>Increases chances of injuries, stress, burnout</td>
<td>May increase rates of overuse injury and burnout</td>
<td>Risk for burnout, overuse injury, decrements in training</td>
<td>Intensified training leads to physical and mental stress and increased rates of dropout</td>
<td>Can lead to increased load, decreased recovery, overuse injury, and burnout</td>
<td>Increases overuse injury, risk for nutritional and sleep deficits, psychological concepts, and burnout</td>
<td>Increased overuse injury, dropout, blunted motor skill portfolio</td>
</tr>
<tr>
<td>Benefits of early, diversified training</td>
<td>Increases likelihood of lifetime sports involvement, physical fitness, and possibly elite participation</td>
<td>May be more effective in developing elite level skill due to skill transfer</td>
<td>Increased long-term participation in sports, increased personal development</td>
<td>Helps identify sports that best fit interests, increases success/ enjoyment of sport, and decreases attrition</td>
<td>Fosters development of wider scope of athletic and social skills; encourages sustained sports participation and enjoyment</td>
<td>Enhances general fitness and aids in motor development</td>
<td>Increases overall athleticism and reduces injury risk; facilitates longer sport careers, increased chance of sustained participation</td>
</tr>
<tr>
<td>Appropriate age of specialization</td>
<td>Late adolescence</td>
<td>Late adolescence</td>
<td>Late adolescence (age 16)</td>
<td>Not defined</td>
<td>Not defined</td>
<td>Not defined</td>
<td>Not specified</td>
</tr>
<tr>
<td>Exception sports</td>
<td>Diving, figure skating, gymnastics</td>
<td>Diving, figure skating, gymnastics, swimming</td>
<td>Figure skating, gymnastics</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
<td>Not specified</td>
</tr>
<tr>
<td>Other recommendations</td>
<td>Take off 1–2 d/wk and 3 mo/y in 1–mo increments</td>
<td>Further research needed regarding effect of specialization on overuse injuries, controlling for intensity and work load</td>
<td>Periodic strength and conditioning to enhance diverse motor-skill development</td>
<td>Competitive weightlifting/power lifting should not be encouraged before completion of puberty; excessively long distance running not recommended before maturation</td>
<td>Athlete development should be viewed on individual basis; definition of athletic success should be centered on the athlete as a whole, unique person</td>
<td>Take time off between sport seasons and 2–3 mo away from sport</td>
<td>Neuromuscular training should be started in early childhood to promote long-term physical development</td>
</tr>
</tbody>
</table>
Burnout

“Response to *chronic stress* in which a young athlete ceases to participate in a previously enjoyable activity”

- Athlete placed in situation of varying demands
- Demands are perceived as excessive
- Young athlete experiences varying physiological responses
- Varying burnout consequences develop

Smith, 1986
Risk Factors for Burnout

• Personal
  – Perfectionism
  – Need to please others
  – Non-assertiveness
  – Focusing only on one’s athletic involvement
  – Low self-esteem
  – High level of perceived stress

• Environmental
  – High training volume
  – Excessive time commitment
  – Demanding performance expectations
  – Frequent, intense competitions
  – Inconsistent coaching practices
  – Little personal control in sport decision making
  – Negative performance

Brenner, 2019
Overtraining - Burnout

DiFiori, CJSM, 2014
<table>
<thead>
<tr>
<th>TABLE 7. Diagnosis of Overtraining Syndrome/Burnout$^{180,192}$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>History</strong></td>
</tr>
<tr>
<td>Decreased performance persisting despite weeks to months of recovery</td>
</tr>
<tr>
<td>Disturbances in mood</td>
</tr>
<tr>
<td>Lack of signs/symptoms or diagnosis of other possible causes of underperformance</td>
</tr>
<tr>
<td>Lack of enjoyment participating in sport</td>
</tr>
<tr>
<td>Inadequate nutritional and hydration intake</td>
</tr>
<tr>
<td><strong>Presence of potential triggers:</strong> (a) increased training load with adequate recovery, (b) monotony of training, (c) excessive number of competitions, (d) sleep disturbance, (e) stressors in family life (parental pressure), (f) stressors in sporting life (coaching pressure and travel demands), (g) previous illness.</td>
</tr>
<tr>
<td><strong>Testing (if indicated by history)</strong></td>
</tr>
<tr>
<td>Consider laboratory studies: complete blood count, comprehensive metabolic panel, erythrocyte sedimentation rate, C-reactive protein, iron studies, creatine kinase, thyroid studies, cytomegalovirus and Ebstein-Barr virus titers.</td>
</tr>
<tr>
<td>Profile of Mood States (POMS): A psychometric tool for a global measure of mood, tension, depression, anger, vigor, fatigue, and confusion.$^{169}$</td>
</tr>
</tbody>
</table>
### Age Children Quit Regularly Playing a Sport (Ages 3-18)

<table>
<thead>
<tr>
<th>Sport</th>
<th>Avg. Age of Last Regular Participation</th>
<th>Avg. Length in Years of Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseball</td>
<td>10.5</td>
<td>3.3</td>
</tr>
<tr>
<td>Basketball</td>
<td>11.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Bicycling</td>
<td>9.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Cross Country</td>
<td>12.7</td>
<td>1.7*</td>
</tr>
<tr>
<td>Field Hockey</td>
<td>11.4</td>
<td>5.1</td>
</tr>
<tr>
<td>Flag Football</td>
<td>10.4</td>
<td>4.1</td>
</tr>
<tr>
<td>Tackle Football</td>
<td>11.9</td>
<td>2.8*</td>
</tr>
<tr>
<td>Golf</td>
<td>11.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Gymnastics</td>
<td>8.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Ice Hockey</td>
<td>10.9</td>
<td>3.1</td>
</tr>
<tr>
<td>Lacrosse</td>
<td>11.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Martial Arts</td>
<td>9.2</td>
<td>2.6</td>
</tr>
<tr>
<td>Skateboarding</td>
<td>12.0</td>
<td>2.8</td>
</tr>
<tr>
<td>Skiing/Snowboarding</td>
<td>12.1</td>
<td>4.3</td>
</tr>
<tr>
<td>Soccer</td>
<td>9.1</td>
<td>3.0</td>
</tr>
<tr>
<td>Softball</td>
<td>10.4</td>
<td>2.8</td>
</tr>
<tr>
<td>Swimming</td>
<td>10.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Tennis</td>
<td>10.9</td>
<td>1.9</td>
</tr>
<tr>
<td>Track and Field</td>
<td>13.0</td>
<td>2.0*</td>
</tr>
<tr>
<td>Volleyball</td>
<td>12.3</td>
<td>2.0*</td>
</tr>
<tr>
<td>Wrestling</td>
<td>9.8</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>All Sports</strong></td>
<td><strong>10.5</strong></td>
<td><strong>2.9</strong></td>
</tr>
</tbody>
</table>
#DONTRETIREKID

Ask kids what they want

Reintroduce free play

Encourage sport sampling

Train all coaches

“Kids everywhere drop out of sports too early. Together, we can keep them in the game.”

Aspen Institute, 2019
Preventing Burnout

**Encourage Life Balance**
- Academics
- Non-sport activities
- Peers

**Strong Social Support System**
- Family
- Athlete
- Coaches
- Medical Staff

Valovich McLeod, 2011; Bergeron, 2015; LaPrade, 2016
Preventing Burnout

Keep workouts interesting, with age-appropriate games and training, to preserve fun during practices.

Take 1 to 2 days per week off from organized or structured sport participation to allow the body to rest or to participate in other activities.

Take 2-3-month breaks from structured training and competition in 1 sport while focusing on other activities and cross-training.

Focus on wellness and teaching athletes to be in tune with their bodies so they become alert to cues that they need to slow down or alter their training methods.

Emphasize skill development more than competition and winning.

Athlete Development Models
Developmental Model of Sport Participation

- **Youth**
  - Single or Multiple Sports
  - Multiple Sports
  - Multiple Sports

- **Early Teen**
  - Single Sport
  - Multiple Sports
  - Multiple Sports

- **Mid-Late Teen**
  - Single Sport
  - Single Sport
  - Multiple Sports

Côté, 1999
Pathway 1: Early Specialization

- **Youth**: Single or Multiple Sports
- **Early Teen**: Single Sport
- **Mid-Late Teen**: Single Sport

Côté, 1999
Pathway 2: Late Specialization

- Youth: Multiple Sports
- Early Teen: Multiple Sports
- Mid-Late Teen: Single Sport

Côté, 1999
Pathway 3: Recreational Multisport

Côté, 1999
American Development Model

https://www.teamusa.org/About-the-USOC/Athlete-Development/Coaching-Education/American-Development-Model
USA Hockey LTAD / Athletics Canada

### LTAD Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Active Start</td>
</tr>
<tr>
<td>2</td>
<td>FUNdamentals</td>
</tr>
<tr>
<td>3</td>
<td>Learning to Train</td>
</tr>
<tr>
<td>4</td>
<td>Training to Train</td>
</tr>
<tr>
<td>5</td>
<td>Training to Compete</td>
</tr>
<tr>
<td>6</td>
<td>Learning to Compete</td>
</tr>
<tr>
<td>7</td>
<td>Training to Win 19+ Junior (NCAA, NHL)</td>
</tr>
<tr>
<td>8</td>
<td>Hockey for Life</td>
</tr>
</tbody>
</table>

#### The 9 Stages include:

1. Active Start
2. FUNdamental
3. Learning to Train
4. Training to Train
5. Learning to Compete
6. Training to Compete
7. Learning to Win
8. Winning for a Living
9. Active for Life


Long-term athletic development pathways should accommodate for the highly individualized and non-linear nature of the growth and development of youth.

Youth of all ages, abilities, and aspirations should engage in long-term athletic development programs that promote both physical fitness and psychosocial wellbeing.

All youth should be encouraged to enhance physical fitness from early childhood, with a primary focus on motor skill and muscular strength development.

Long-term athletic development pathways should encourage an early sampling approach for youth that promotes and enhances a broad range of motor skills.

Health and wellbeing of the child should always be the central tenet of long-term athletic development programs.

Lloyd, NSCA, 2016
Long-Term Athletic Development

Youth should participate in physical conditioning that helps reduce the risk of injury to ensure their on-going participation in long-term athletic development programs.

Long-term athletic development programs should provide all youth with a range of training modes to enhance both health- and skill-related components of fitness.

Practitioners should use relevant monitoring and assessment tools as part of a long-term physical development strategy.

Practitioners working with youth should systematically progress and individualize training programs for successful long-term athletic development.

Qualified professionals and sound pedagogical approaches are fundamental to the success of long-term athletic development programs.

Lloyd, NSCA, 2016
“Number one is just to gain a passion for running. To love the morning, to love the trail, to love the pace on the track. And if some kid gets really good at it, that’s cool too.” – Pat Tyson, award-winning high school and college cross-country coach*

“Somewhere behind the athlete you’ve become and the hours of practice and the coaches who have pushed you is a little girl who fell in love with the game and never looked back... play for her.” – Mia Hamm, member of United States women’s national soccer team*

“Before kids can play like a pro, they must enjoy playing the game like a kid.” – Steve Locker, national and international soccer player, coach, and author**
ATSU Concussion Program | Athletic Training

www.atsuconcussion.com
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