SPORT SCIENCE IN BADMINTON

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No disclosures
Who am I?

1993-1994 Elite Coach Academy in DK
1994-1995 Ass. national coach in Germany
1996-2006 Danish national player
1995-2011 Coach in Danish Elite- and 1.Division clubs
2007 Medical Doctor
2014 Orthopedic Surgeon
2010- Member of Danish Society of Sports Medicine
2017 Member of BWF Sport Science and Medical Research Commission
Todays talk

1. BWF Sport Science and Medical Research Commission
2. Brief literature review on badminton injuries
3. The most severe injuries in badminton
4. Global badminton health study
5. Load and injuries
Take Home messages

Only stupid players get injured

or

Injured players belong to stupid coaches
The BWF Sport Science & Medical Research Commission has three key goals:

- Encourage and widen interest and investment in applied research in Badminton.
- Improve the level and quantity of scientific material available to players, coaches and badminton practitioners.
- Contribute towards the increased knowledge of performance and safety at the international level – of coaches and players.
Applied Sport Science

Physiology

Biomechanics

Psychology

Motor Control

Nutrition

Sports Medicine

Athlete
# BWF Research Grants

<table>
<thead>
<tr>
<th>YEAR</th>
<th>TOTAL APPLICATIONS</th>
<th>RESEARCH PROJECT</th>
<th>TOTAL FUNDING USD</th>
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<td>2013 - 2014</td>
<td>29</td>
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<td>2018 - 2019</td>
<td>45</td>
<td>14</td>
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Research Grants - Best Practice

Area: Player Development / Institution: Leeds Beckett University

1. Player Development and Coaching Systems in four Leading Badminton Nations

2. Indonesia, Denmark, Korea and Spain.
Area: Biomechanics / Institution: Loughborough University

Optimum performance in the Badminton Smash
Area: Para-Badminton / Institution: University of Applied Sciences Germany

The Trunk: Strength ratios / Strength in German Elite Para-Badminton Players (Standing Classes and Wheelchair Classes)
A review of the available worldwide literature relating to badminton has been conducted:

- Research has used the Sportdiscus, Embase, Cochrane Library, Rehabilitation and Sports Medicine, Web of Science, PsycINFO, Science Direct, Mendeley, Scientific.net, Google Scholar.

- A total of 850+ publications that contained the word “Badminton” in the title and/or in the abstract.

<table>
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<tr>
<th>FIELD</th>
<th>PUBLICATIONS</th>
<th>FILED</th>
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<td>Biomechanics</td>
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<td>Engineering and Technology</td>
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<td>Notational and Analysis</td>
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<td>Youth Development</td>
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<td>Sociology of Sport</td>
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Injuries in badminton - What is the evidence?
MUSKULOSKELETAL INJURIES AMONG MALYSIAN PLAYERS 2005-2007

• Jan. 2005- June 2007

• 190 players

• 469 injuries

• Mild: 91,5 % (1-7 days of absence)

• Moderate: 1,5 % (8-21 days of absence)

• Severe: 7,0 % (> 21 days of absence)
Injury region (Shariff et al 2008)
INJURY TYPE (SHARIFF ET AL 2008)

• Overuse 169 (36.0 %)
• Strain 145 (30.9 %)
• Sprain 122 (26.0 %)
• Fracture 23 (4.9 %)
• Others 10 (2.1 %)
Protecting athletes’ health and preventing injuries in badminton are top priorities for the BWF.
The aim of this study is to report injuries among elite junior badminton players and to investigate if certain risk factors are associated with previous and present injuries.

**QUESTIONNAIRE**

- Background
- Significant injuries
- Musculoskeletal Health
- Sleep Quality

**PHYSICAL ASSESSMENTS**

- Ankle Dorsiflexion Measurement
- Hip ROM and impingement tests
- Shoulder ROM
- Shoulder Impingement
Global Health Badminton Study

NEXT STEPS:

Prospective follow up with injury surveillance in general

Follow up on specific injuries in the shoulder and hip

Prevention of specific injuries
Is badminton dangerous?
ACL is the most severe injury
ACL injury

Kimura et al 2010, 2012

Women

Location

High valgus ankle
Prevention of anterior cruciate ligament injuries in female team handball players: a prospective intervention study over three seasons.

A randomized controlled trial to prevent noncontact anterior cruciate ligament injury in female collegiate soccer players.
A meta-analysis

Higher rates of compliance with neuromuscular training programs were associated with lower rates of anterior cruciate ligament (ACL) injury incidence among physically active young females.

A potential inverse dose-response relationship exists between compliance with neuromuscular training and the incidence of ACL injury in young female athletes.

Attending and completing prescribed neuromuscular training sessions seem to be integral components of preventing ACL injuries in young female athletes.

Dai Sugimoto. Journal of Athletic Training 2012;
100% athletes who return to sport less than 5 months after an ACL reconstruction suffered a knee reinjury.
Achilles tendon rupture
Achilles tendon rupture – just a sick tendon?
Achilles tendon rupture
Lateral ankle sprain
Lateral ankle sprain

- **Indoor sports** responsible for the highest incidences of lateral ankle sprains\(^1,4,5\)
  - Typically **Non-contact** injury\(^1,4,5\)
  - Especially predominant in:
    - Handball\(^1,4\)
    - Basketball\(^1,4\)
    - Badminton\(^1,4,5\)

- **24.3% of ALL lower extremity injuries**\(^6\)

\(^1\)Gribble et al., 2016; \(^2\)Fahlström et al., 1998
\(^3\)Doherty et al., 2013; \(^4\)Fong et al., 2007; \(^5\)Kaldau, 2018; \(^6\)Shariff et al., 2009
Lateral ankle sprain

May result in long term problems
Up to 40-50% may suffer from chronic ankle instability
Verhagen & Bay, 2010; Gribble et al., 2016; Vuurberg et al., 2018

Viktor Axelsen having problems >1 year after initial ankle sprain.....
“Based on current evidence, a combination of an external prophylactic measure (tape or brace) with neuromuscular training will achieve the best preventive outcomes with minimal burden for the athlete”

(Verhagen & Bay, 2010)
Take Home messages

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or

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Thank you