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# Incidence of head injuries among Swedish Paralympic athletes – a prospective 52 week study

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# Disclosure

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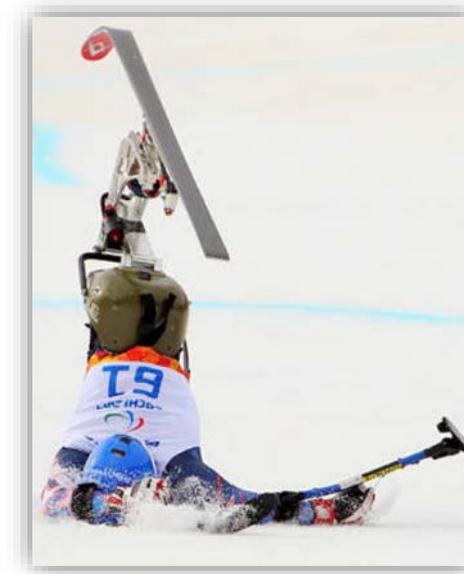
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# Introduction

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- Successful injury/illness surveillance during the Paralympic games shows that sports-related injuries in general are a concern
- In particular, head injuries with concussion have been in focus
- However, very little data on the prevalence and incidence
- A concern that head injuries are underreported
- No prospective studies over time



# The Sports-related Injury and Illness in Paralympic Sport Study (SRIIPSS)



Literature search and critical review

*Fagher & Lexell 2014*



Athletes' perceptions of experiences

*Fagher et al. 2016*



Development & structure of study protocol

*Fagher et al. 2016*



Development & evaluation of eHealth application

*Fagher et al. 2017*



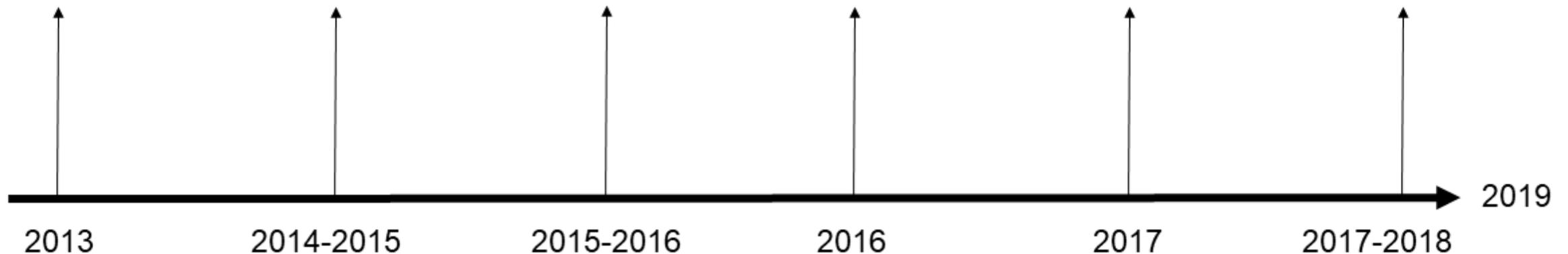
Prevalence of injuries & illnesses. Athlete demographics & behavior

*Fagher et al. 2019*



Incidence, severity and risk factors of injuries & illnesses.

*Under review*



# Aims

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- To assess the 1-year incidence of head injuries leading to absence from sports participation among Swedish Paralympic athletes
- To describe the mechanisms of injury
- To identify any differences in the proportion of head injuries between athletes with different impairment, sport and athlete behavior



# Methods

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- **Study design:** Closed longitudinal prospective study
- **Participants:** 107 Swedish athletes, candidates for the Paralympic Games
- **Data collection:** Electronic self-reports in an adapted eHealth application
- **Definition:** Any new head injury that cause changes in normal training or competition to the mode, duration, intensity, or frequency, regardless of whether or not time is lost from training or competition
- **Statistics:** Descriptive statistics used to assess the incidence rate (IR) and incidence proportion (IP), Chi square statistics ( $p < 0.05$ )



## Athlete demographics

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- 104 athletes (34% women, 66% men)
- Mean age 29 years (18-63 years)
- On average 9 hours (IQR 7-12) per week in training
- Impairments
  - Physical 74%
  - Visual 20%
  - Intellectual 6%



# Athlete demographics

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- Sports
  - Summer 82%
  - Winter 18%
  - Wheelchair 50%
  - Ambulatory 50%
  - Team 45%
  - Individual 58%



## Incidence rate and proportion of head injuries

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- 13 head injuries reported by 10 athletes
  - All verified and handled by medical professions (MD and PT)
- 5 women and 5 men (median age 27 years, IQR 26-36)
  - 3 female athletes reported two head injuries each
- Average weekly training load of 12 hrs/w (IQR 6-15) (compared to 9 hrs/w for all)
- 26 006 training hours reported
- Incidence rate (IR) 0.5/1000 training hours
- Annual incidence proportion (IP) 10%



# Demographics

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- Majority of head injuries in visually impaired athletes (61%)
- 39% in athletes with a physical impairment
- Sports
  - Goalball (n=4)
  - Para ice-hockey (n=2)
  - Equestrian sport (n=2)\*
  - Swimming (n=2)\*
  - Judo (n=2)\*
  - Wheelchair basketball (n=1)
    - » \*multiple head injuries, all women



## Injury mechanisms

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- Occurrence
  - 8 head injuries during training
  - 4 head injuries during competition
  - 1 outside of sports
- Time loss – out of training
  - 5 athletes (38%) – 4-7 days
  - 3 athletes (23%) – 8-20 days
  - 5 athletes (38%) - >20 days
- Injury mechanisms
  - 9 collisions with foreign object (ball, swimming pool, wheelchair)
  - 4 collisions with another athlete



## Associations

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- Athletes with visual impairment significantly higher proportions of head injuries (compared to entire study population) ( $p=0.003$ )
- Significant association between head injuries and using NSAID monthly ( $p=0.049$ )
- Significantly more head injuries in athletes that had a history of previous psychological complaints ( $p=0.012$ )



# Conclusions

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- First 1-year incidence study of head injuries in parasport leading to absence from normal training
- Incidence rate similar to concussion IR in FIFA soccer and NFL football
- Incidence proportion of 10% can be considered high
- Several athletes with multiple head injuries
- Visually impaired athletes at risk for head injuries
- Goalball, swimming and judo sports with highest risk
- Associations between monthly use of NSAID and reports of previous psychological complaints need further investigations

