422 ANALYSIS OF ATHLETIC INJURIES, BIOMECHANICAL ASPECTS AND SPORTS PERFORMANCE IN AMPUTEE SOCCER – A SYSTEMATIC REVIEW

[1]Aneta Kasprzyk, [2]Kasinska Zofia, [3]Narloch Dominika, [4,5]Grygorowicz Monika. *[1]FitandFuture, St. Clement, Jersey (UK); [2]Department of Adapted Physical Activity, Poznan University of Physical Education, Poznan, Poland; [3]Department of Physiotherapy in Dysfunctions of the Locomotor System and Sports Medicine, The Jerzy Kukuczka Academy of Physical Education, Katowice, Poland; [4]Department of Physiotherapy, Poznan University of Medical Sciences, Poznan, Poland; [5]Rehasport Clinic FIFA Medical Centre of Excellence, Poznan, Poland*

10.1136/bjsports-2021-IOC.386

Background Many studies show the beneficial effects of sport activity on amputees. Understanding of biomechanical factors, performance and injury epidemiology in amputee soccer (AS) can contribute to implement injury prevention measures and develop suitable training programs to reduce number of injuries, increase sport performance, and ultimately improve quality of life in this population.
Objective To analyse incidence and/or prevalence of sports injuries in AS, to determine the impact of amputation on sports performance in AS, to examine biomechanics aspects of AS.
Design We searched PubMed, MEDLINE, SPORTDiscus, Scopus, Web of Science, Journals@Ovid, Academic Search Ebsco using keywords (amput*, prosthe*, disarticulation, hemipelvectomy, crutch) AND (futbol, soccer, football*, athlete*).
Setting Any amputee soccer competition level.
Participants Amputee soccer players.
Interventions Any paper tackling the issue of the incidence, type, pattern of injury and/or describing biomechanical factors and/or sport performance in AS. Joanna Briggs Institute tools were used to assess the quality of studies.
Main Outcome Measurements Injury, biomechanics- and performance-specific outcomes.
Results From 375 articles, 26 studies were included related to injury (n=1), biomechanics (n=3), and performance (n=22) in AS. Majority of studies had a descriptive or analytical cross-sectional design. The results showed that AS is a sport with a low risk of injury and usage of Loftstrand crutches by players increase symmetrical gait pattern with better scapular resting position, than in other amputee wheelchair sports. None of the studies has met all criteria relevant to JBI tool.
Conclusions Analysis of the studies revealed that there is a base of knowledge on AS injuries, biomechanics, and athletic performance. However, limitations, in terms of methodological deficits, small sample size, and in some cases, laboratory setting, are reasons for future research to place greater importance on reducing the risk of bias to increase the reliability and validity of study results.

423 PREVALENCE AND BURDEN OF HEALTH PROBLEMS IN TOP-LEVEL FOOTBALL REFEREES

[1,2]Christian Moen, [1,4]Thor Einar Andersen, [1,3]Ben Clarsen, [4]Gitte Madsen-Kaarød, [1,2]Torstein Dalen-Lorentsen. *[1]Oslo Sports Trauma Research Centre, Oslo, Norway; [2]Norwegian School of Sports Sciences, Oslo, Norway; [3]Department of Health Promotion, Norwegian Institute of Public Health, Bergen, Norway; [4]The Norwegian FA Sports Medicine Clinic, Oslo, Norway*

10.1136/bjsports-2021-IOC.387

Background Top-level football referees make decisions during strenuous physical activity and often under great mental pressure. Despite their central role in a football match, little is known about referees' health problems, particularly female referees.
Objective To investigate the prevalence and burden of health problems in female and male top-level football referees.
Design Prospective cohort study.
Setting Female and male referees from the Norwegian female and male top divisions.
Patients (or Participants) All top-level referees (n=55) were included in this study.
Interventions (or Assessment of Risk Factors) Referees reported health problems (injuries and illnesses) through text messages for 49 weeks using the Oslo Sports Trauma Research Center Questionnaire on Health Problems (OSTRC-H2).
Main Outcome Measurements Prevalence of all health problems.
Results On average, 34% (95% CI 31–36%) of referees reported at least one health problem each week, and 20% (95% CI 19–22%) reported substantial health problems. The compliance was 98.1%. The injury incidence was 3 injuries per athlete-year (95% CI 2.5 to 3.5) and 12 injuries per 1000 match hours (95% CI 7 to 19). Gradual-onset injuries were most prevalent, with an average weekly prevalence of 23%, and caused the greatest absence from training and matches (60% of total time loss). Of the 156 reported injuries, 36% were related to the lower-leg and foot. Illnesses represented a small portion of the overall burden of health problems. Female referees reported more health problems than male referees, and on-field referees reported more health problems than assistant referees.
Conclusions Top- level referees reported a high prevalence of health problems during one full season. Gradual onset injuries to the lower-leg and foot represented the highest injury burden, especially in female referees.

424 PERFORMANCE HEALTH MANAGEMENT IN ENGLISH PROFESSIONAL FOOTBALL

Kunle Odetoyinbo, McKay Carly. *ESPARC Ltd/University of Bath, Bath, UK*

10.1136/bjsports-2021-IOC.388

Background High match frequency in professional men's football has been associated with injury risk. It is unclear how this is affected by the activities of club support staff.
Objective To determine whether the structures and processes adopted by a performance and healthcare team (PHCT) were associated with player availability (PA) during periods of match congestion, using the Integrated Team Effectiveness Model.
Design Sequential explanatory mixed method case study.
Setting A single English Championship football club.
Participants Ten PHCT staff from medical, sport science, and data analysis departments.
Interventions The PHCT completed validated team process/structure questionnaires twice monthly during the 2017–18 season. PA and match frequency data were provided by the PHCT, who also participated in a post-season focus group.
Main Outcome Measures Associations between PA, match congestion (i.e. ≤3 days between matches) and team structures/

processes were assessed using Pearson correlation. Framework and content analysis were used to qualitatively explore PHCT perceptions of teamwork effectiveness.

Results Mean PA during match congestion was 78.1% (95% BCa: 76.2, 80.4) compared with 84.2 (95% BCa: 80.6, 87.3) during uncongested periods. There were significant associations between match frequency and PA (r= - 0.68; 95% BCa: 0.32, 0.93; p = 0.008) and PHCT processes and PA (r= 0.53; 95% BCa: 0.09, 0.89; p = 0.035). Having more PHCT meetings (r= 0.46; BCa 95%: 0.22, 0.82; p = 0.048) and greater satisfaction with those meetings (r= - 0.41; BCa 95%: 0.04, 0.07; p = 0.043) were associated with higher PA, irrespective of match frequency. During match congestion the PHCT reported issues relating to resources and task co-ordination that negatively impacted their processes.

Conclusion The structure and processes adopted by a PHCT in professional football are related to PA, reflecting the influence of teamwork effectiveness. These findings have implications for injury prevention and management in professional football.

425 ATTITUDES, BELIEFS, AND BEHAVIOUR TO THE ADDUCTOR STRENGTHENING PROGRAMME IN MALE PROFESSIONAL FOOTBALL: SUCCESSFULLY ADOPTED, BUT USUALLY MODIFIED

[1]Joakim Stensø, [2]Thor Einar Andersen, [2]Joar Harøy. *[1]Norwegian School of Sport Sciences, Oslo, Norway; [2]Oslo Sports Trauma Research Center, Department of Sports Medicine, Norwegian School of Sport Sciences, Oslo, Norway*

10.1136/bjsports-2021-IOC.389

Background The Adductor Strengthening Programme (ASP) is the first groin specific prevention programme proven to reduce the risk of groin problems in male football. Widespread dissemination of the programme and its preventative effect is recommended, however, successful implementation require researchers acquiring comprehensive knowledge of the implementation context. Using the Reach Effectiveness Adoption Implementation Maintenance (RE-AIM) framework is recommended for this procedure.

Objectives First, to investigate delivery agents' attitudes, beliefs, and behaviour regarding the ASP using the RE-AIM framework. Second, to present a 'best practice' protocol based on the reported usage of the ASP in a professional team setting.

Design Descriptive cross-sectional.

Setting Norwegian male professional football teams.

Participants The primary delivery agent of injury prevention exercise programmes in each team (n=32).

Intervention Survey using a pilot tested questionnaire.

Results Twenty-nine (91%) participants responded. All respondents (100%) were familiar with the ASP and its potential to mitigate the burden of groin problems. All delivery agents (100%) adopted the ASP, however, only 10% used it in accordance with the evidence-based protocol. The main modifications were that players in 72% of the teams were instructed to perform a non-progressive number of repetitions during pre-season, and 86% of the teams performed more sets, but fewer repetitions per set during in-season. In total, 97% of delivery agents planned to continue using the ASP in the subsequent season. The two most stated reasons for using the ASP, were first, its documented injury preventive effect and second, that it doesn't require any additional equipment.

Conclusion The delivery agents had positive attitudes and beliefs to the ASP. Moreover, they widely adopted and planned to maintain its usage in the next season. Most of the delivery agents modified the original ASP protocol, which warrant further investigations.

426 THE ASSOCIATION BETWEEN COVID-19 AND PHYSICAL PERFORMANCE IN PROFESSIONAL FOOTBALL PLAYERS: A PROSPECTIVE COHORT STUDY

[1]Evi Wezenbeek, [1]Sander Denolf, [2]Jan Bourgois, [3]Renaat Philippaerts, [4]Bram De Winne, [1]Erik Witvrouw, [5]Steven Verstockt, [1]Joke Schuermans. *[1]Department of Rehabilitation Sciences and Physiotherapy, Ghent University, Ghent, Belgium; [2]Department of Movement and Sports Sciences, Ghent University, Ghent, Belgium; [3]Royal Standard de Liège, Liège, Belgium; [4]Zulte Waregem, Waregem, Belgium; [5]Department of electronics and information systems, Ghent University, Ghent, Belgium*

10.1136/bjsports-2021-IOC.390

Background COVID-19 substantially impacts cardiorespiratory functioning, potentially affecting physical performance of elite athletes.

Objective To investigate the association between COVID-19 and physical performance in elite male football players.

Design A prospective cohort study during the first half of the 2020–2021 season.

Setting Belgian professional football.

Participants 84 players of three elite football teams.

Assessments Strength tests (Nordbord and Groinbar), vertical jump tests (Squat jump and Countermovement jump) and the YoYo Intermittent Recovery test - Level 1 (YYIR1) were assessed at fixed time intervals throughout the season. Polymerase chain reaction (PCR) testing was performed before each official game to detect COVID-19 infection.

Main Outcome Measurements Athletic performance was evaluated by within- and between group comparison.

Results Twenty-two subjects tested positive for COVID-19 during the follow-up period. When comparing heart rate (HR) values (normalized to the athlete's maximal HR) during YYIR1 between formerly infected players and healthy controls of the first testing after infection (52 ± 11.23 days after positive PCR testing), a significantly higher HR was found in formerly infected players at 3 minutes (p=0.017) and a trend towards significance was found at 6 minutes (p=0.061). These in-between group differences were resolved at the second testing after infection (127.62 ± 33.10 days after positive PCR testing). When comparing the YYIR results before and after infection within the group of infected players, trends towards significantly higher HR at 3 (p=0.057) and 6 minutes (p=0.068) were seen, with no residual within group differences at the second testing after infection. Interestingly, none of the strength and vertical jump tests presented any association with COVID-19 infection.

Conclusions Intermittent aerobic endurance capacity evaluated by the YYIR1 test was established to be significantly lower in professional football players previously infected with COVID-19. These decrements appeared to resolve with time.