Title: Professional youth football academy injury data: collection procedures, perceived value, and use

Submission type: Original Investigation

Authors:
Robert McCunn[1, 2]
Neil V Gibson[2]
Hugh HK Fullagar[3]
Liam D Harper[4]

Institutions:
[1]Institute of Sport and Preventive Medicine, Saarland University, Saarbrücken, Germany
[2]Oriam: Scotland's Sports Performance Centre, Heriot-Watt University, Edinburgh, UK
[3]Sport & Exercise Discipline Group, UTS: Health, University of Technology, Sydney, New South Wales, Australia
[4]Division of Sport and Exercise Sciences, University of Huddersfield, Huddersfield, UK

Corresponding author:
Robert McCunn
Institute of Sport and Preventive Medicine
Campus, Geb. B8.2
Saarland University
Saarbrücken
Saarland, 66123
Germany
Tel: +49 (0) 681 302 70410
Fax: +49 (0) 681302 4296
E-mail: bob.mccunn@me.com

Running head: Academy injury data: collection, value & use

Tables: 3

Figures: 3

Word count: 4360

Coauthor email addresses:
Neil V Gibson - N.Gibson@oriam.hw.ac.uk
Hugh HK Fullagar - hhkf238@gmail.com
Liam D Harper - L.Harper@hud.ac.uk

ABSTRACT

Purpose: There is a paucity of descriptive injury data relevant to professional academy football, with little to no evidence reporting how sports science/medicine staff within academies collect and use injury data.

Materials and methods: An online survey comprising of scaled, rank or open-ended questions relating to the perceptions surrounding injury data collection, its value and use was developed. Forty-seven applied practitioners working for different professional football academies from seven countries completed the survey.

Results: Injury data collection procedures conducted by appropriately trained medical staff are widespread among football academies. Injury data collection within academies was deemed worthwhile and important by 79% of practitioners, with 88% strongly agreeing/agreeing that it is used to inform injury prevention strategies. Similarly, 79% strongly agreed/agreed that using injury data for academic research is worthwhile; however, lack of time and reluctance from the academy to share its data were cited as barriers. The engagement with and use of injury data by coaching staff appears to be relatively poor, with only 49% of practitioners stating coaches formally review data.

Conclusions: Injury data are widely collected within academies and practitioners consider this information valuable. However, improving engagement with coaches and using the data for academic research could further improve applied practice via encouraging the implementation of evidence-based practice.

Practical implications: Applied practitioners should consider sharing injury data with both researchers and coaches. In doing so evidence-guided injury prevention interventions may be developed and subsequently applied in the field.

Keywords: Adolescent, epidemiology, prevention, injuries, soccer

INTRODUCTION

Reducing the incidence and severity of injury is one of the primary tasks assigned to applied practitioners, such as physiotherapists, medical doctors, strength and conditioning (S&C) coaches and sport scientists working within professional football. The 'sequence of prevention' model developed by van Mechelen et al. (1992) in relation to sports injury highlights that the first step in this goal is establishing the extent of the problem (i.e. injury epidemiology). Indeed, a wealth of evidence exists detailing the epidemiology of football-related injury among senior professional players, most notably via the series of Union of European Football Associations (UEFA) elite club injury studies (Ekstrand et al. 2011; Ueblacker et al. 2015; Ekstrand et al. 2016). However, a recent systematic review investigating injury epidemiology within elite youth football identified only six studies meeting the inclusion criteria (injury and exposure data collected prospectively over the course of at least six months among high-level players aged between eight and 19 years of age), with only two of these published in the last 10 years (Pfirrmann et al. 2016). The paucity of descriptive injury data relevant to professional club academy football players is perhaps surprising given the prevalence of such institutions (Richardson et al. 2004).

Little evidence currently exists reporting how sports science/medicine staff within academies collect and use injury data. Indeed, whether making use of this information is perceived as important to these key stakeholders or not is currently unclear. Yet in order to function as evidence-guided practitioners the collection of injury data within one's own operating environment is essential. Fuller et al. (2006) have provided guidelines related to injury data collection and reporting. The guidelines are comprehensive and include definitions, severity classifications, logistical protocols and numerous example scenarios. However, there are

some methodological issues associated with these guidelines when trying to apply them within a non full-time playing environment such as an academy – namely the lack of daily contact with the players (McCunn et al. 2016). A more holistic understanding of the academy environment and the potential barriers hindering the conduction of scientific research within these institutions is warranted. Such information may help encourage applied practitioners and decision-makers within professional academies alike to address the lack of published scientific research related to high-level youth injury epidemiology/prevention. Indeed, the benefits related to academy injury prevention research extend beyond the scientific literature and may ultimately facilitate improved applied practice.

Injuries sustained as a youth player can result in long-term health sequelae (e.g. osteoarthritis later in life) (Øiestad et al. 2009). Similarly, injury can result in emotional and psychological trauma in addition to the immediate physical complaint (McArdle, 2010). Furthermore, limiting injury incidence equates to higher player availability and in turn more successful team performance (Hägglund et al. 2013b). Mitigating the risk of injury and hence avoiding these negative health consequences while in turn promoting improved performance should be a priority for applied practitioners working in academies. Collecting epidemiological data allows academies to understand the nature and burden of injuries suffered by their players. In turn, this information can be used to inform prevention strategies aimed directly at addressing the most common and burdening injury types. Therefore, the aim of the present study was to establish: 1) if/how injury data are collected within professional youth football academies, 2) how valuable applied practitioners consider injury data and, 3) if/how the injury data collected are used and applied in the practical setting.

MATERIALS & METHODS

Following ethical approval from the Human and Health Sciences Ethics Committee at **blinded for peer review**, 125 practitioners from professional football academies were identified as having roles associated with injury data collection and its application. Practitioners were contacted electronically between January and March 2017. Only one practitioner per football team was contacted to ensure that findings were not influenced by multiple responses from the same team. The survey requested that the individual most informed or primarily responsible for injury data collection within the academy answer the questions. Completed responses were returned by staff from 47 individual academies, representing a 38% response rate. Information regarding practitioners' role and level of competition is provided in Table 1 and Table 2.

Table 1 & 2 near here

Information relating to the nature of the questions was provided to participants before the survey and each practitioner gave consent before study involvement. The survey (Appendix 1) was created using an online resource (Bristol Online Surveys, University of Bristol, UK) with an approximate completion time of 10 minutes. Practitioners were asked to disclose the club they were affiliated to, and their position within the club. The survey contained nine main questions with eight sub questions in a scaled, rank or open-ended format. While the consideration of qualitative information (such as that derived from open ended questions) is typically less common than quantitative data within the sport sciences, it allows for a more holistic and nuanced understanding of any given issue, crucially providing real-world context (Harper & McCunn 2017). The unstructured or open-ended component allowed practitioners space to justify their answer to particular scaled questions. The specific wording used within

the survey was decided upon by consensus of all the present authors and the development of the questions included two rounds of editing, discussion and amendments. Once a finalised version had been agreed upon two non-native English speakers independently reviewed the survey. This was to ensure it was comprehensible and did not contain any English idioms or wording that may create ambiguity among non-native speakers. Similarly, the survey was also translated into German and independently reviewed by a native German speaker to ensure the nature of the questions remained consistent between both versions. A native German speaker translated surveys completed in German back to English. These translated answers were then reviewed by a native English speaker in conjunction with a native German speaker to ensure clarity of interpretation.

Survey Topics

Collection Procedures

Practitioners were asked if injury data were collected in any form, with either yes or no as a potential answer. If the practitioner answered yes they were also required to state who primarily records the data, with the following options provided: *medical doctor, qualified physiotherapist, qualified physical therapist, S&C coach/sport scientist, university student, player (self-recording), coach*, or *other* (with space to elaborate). Furthermore, practitioners who answered yes were then asked if all physical complaints were documented, or only time-loss injuries.

Practitioners who answered yes were also asked if a clinical diagnosis was made for each injury case or if the information gathered was limited to reporting of general location and

symptoms only. Clinical diagnosis was defined as the use of medical/anatomical terminologies and laboratory/medical testing. If a clinical diagnosis was made the practitioners were asked to specify if a medical doctor/qualified physiotherapist, or another member of personnel made this diagnosis.

If a practitioner answered no to the question regarding if injury data was collected in any form, they were automatically directed to a separate series of questions and were asked to respond to the following statements: 'Collecting player injury data within the academy is important' and 'The player injury data collected within the academy is used to inform our injury prevention strategies and guide financial investment within the medical/strength & conditioning/sport science department(s)' by using a 5-point Likert-type scale with the following options given: *strongly agree, agree, neither agree or disagree, disagree, strongly disagree*. Practitioners also were asked to justify their view to the first statement in an open-ended answer box. They were also asked: 'To the best of your knowledge, how much consideration is given to player injury data when deciding whether to recruit, retain or release an individual?'. The following options were provided: *none, very little, some, a lot, considered critical, not sure.*

Player illness

Practitioners were asked if player illnesses (e.g., cold/flu, gastrointestinal complaints) data were collected in any form, with a simple yes or no response required.

Perceived value

Practitioners stated how much they agreed with the following statement: 'Collecting player injury data within the academy is important' by using a 5-point Likert-type scale with the following options given: *strongly agree, agree, neither agree or disagree, disagree, strongly disagree*. Practitioners were then asked to justify their view in an open-ended answer box.

Practitioners also stated how much they agreed with the statement 'Sharing/using our data for academic research purposes is worthwhile and important', using a 5-point Likert-type scale with the following options provided: *strongly agree, agree, neither agree or disagree, disagree, strongly disagree*. Regardless of answer, practitioners were then asked what the primary obstacle (if there was one) preventing/limiting the use of their injury data for academic research is, with the following options provided: *the club does not want to share their data with external partners, lack of time/staff resources, we (club staff) are unsure how the data could best be used from a research perspective, there is no immediate benefit/competitive advantage in engaging in academic research, no obstacle, other* (with space provided for elaboration).

Use and application

Utilising a 5-point Likert-type scale with the following options given: *strongly agree, agree, neither agree or disagree, disagree, strongly disagree,* practitioners were asked how much they agreed with the statements 'the player injury data collected within the academy is used to inform our injury prevention strategies' and 'the player injury data collected within the academy are used to guide financial investment within the medical/strength & conditioning/sport science department(s)'.

Practitioners were then asked if medical staff formally review the data, and if so, how frequently, with options provided as: *daily, weekly, monthly, annually, other* (with space to elaborate). A similar question was then asked regarding if coaching staff formally review the data, and if so, how frequently.

The final question was: 'To the best of your knowledge, how much consideration is given to player injury data when deciding whether to recruit, retain or release an individual?'. The following options were provided: *none, very little, some, a lot, considered critical, not sure.*

Data Analysis

Due to the cross-sectional and descriptive nature of the study design, the data is presented in a descriptive manner. For questions utilising a Likert-scale, frequency analysis was used to establish the percentage of practitioners who had selected a particular response. Written responses for the open-ended questions (i.e., where practitioners justified their answers) were exported into a word processing program and read several times for habituation and to construct a clear understanding of the content (Thomas 2006). The raw data were then organised and subjected to inductive content analysis (also known as the General Inductive Approach), a data driven technique, which occurs independently of any pre-existing frameworks or preconceptions (Patton 2015). Analogous themes were classified as general dimensions and allocated an overarching descriptor. For further detail on the General Inductive Approach see Thomas (2006). Following inductive analysis, peer debriefing and member checking (a form of independent validation) was utilised by the research team to increase credibility and ensure that a correct interpretation of the data had occurred (Creswell & Miller 2000). Finally, a deductive approach was employed to corroborate the findings of

the inductive analysis and to establish any theoretical relationships within the data (Patton 2015).

RESULTS

Collection procedures and Player illness

When asked if any injury data was collected at their academy, all practitioners answered yes. Thirty-nine (83%) stated that a qualified physiotherapist records the data, 4 (9%) stated that a strength and conditioning coach/sport scientist records the data, with medical doctor (2; 4%), qualified physical therapist (1; 2%), and coach (1; 2%) also being selected. No one selected university student, player, or other.

When asked if all physical complaints are documented or only time-loss injuries, answers were more discordant. Thirty (64%) specified that all physical complaints are documented, with the remaining 17 (36%) stating that only time-loss injuries are documented. Similarly, 36 (77%) of practitioners indicated that a clinical diagnosis is made for each injury case, with all practitioners specifying that a medical doctor/physiotherapist makes the diagnosis. The remaining 11 (23%) practitioners stated that location/symptoms are recorded, but a clinical diagnosis is not made for each injury case. Thirty-seven (79%) practitioners indicated that player illness data were collected in their academy, with 10 (21%) indicating that no player illness data were collected.

Perceived value

When asked how much they agreed with the statement "Collecting player injury data within the academy is important", 41 (87%) practitioners strongly agreed and 6 (13%) agreed with no one selecting strongly disagree/disagree or neither agree nor disagree. The second order themes that were identified relating to the importance of collecting player injury data are provided in Table 3.

Table 3 near here

Twenty five (53%) practitioners agreed that sharing/using their academy's injury data for academic research purposes is worthwhile and important, with 12 (26%) strongly agreeing, 5 (11%) neither agreeing or disagreeing, 2 (4%) disagreeing, and 3 (6%) strongly disagreeing (Figure 1). The obstacles preventing/limiting the use of injury data for academic research from most selected to least selected were: lack of time/staff resources (21; 45%), club does not want to share data with external partners (9; 19%), no obstacle (7; 15%) unsure how data could be best used from a research perspective (6; 13%), other (3; 6%), and no immediate benefit/competitive advantage in engaging in academic research (1; 2%). Of the three who selected 'other', the only general dimension identified was confidentiality (e.g., "*we want to make sure our players' personal medical data isn't publicly available*" and "*legally only medical staff can access injury notes because it is considered confidential information – however, sharing general injury information is something I believe the club would be willing to share, e.g., number of hamstring injuries etc.*").

Figure 1 near here

Use and application

When asked if the player injury data collected within their academy was used to inform their injury prevention strategies, 19 practitioners (41%) strongly agreed, 22 (47%) agreed, 4 (9%) neither agreed or disagreed, 2 (4%) strongly disagreed, and no one disagreed. However, when asked if the player injury data collected was used to guide financial investment within the medical/strength and conditioning/sport science department(s), the results did not follow the same pattern (Figure 2). The majority (19; 40%) of practitioners disagreed, 10 (21%) neither agreed or disagreed, 4 (9%) strongly disagreed, 11 (23%) agreed, and 3 (6%) strongly agreed.

Figure 2 near here

The majority of practitioners (41; 87%) indicated that academy medical staff formally review player injury data, with 6 (13%) stating that no formal review is undertaken. In terms of regularity, results were diverse. The review periods selected by respondents were as follows: monthly, 11 (27%); weekly, 9 (22%); daily, 8 (20%); annually, 7 (17%); and other, 6 (15%). When the responses of the six who selected other were grouped together, the following timescales were stated: twice a year, three/four times each season, every 6 weeks, and no set time period (reviewed when required).

When asked if coaching staff formally reviewed injury data there were as a contrast in responses to medical staff reviewing the data with 24 (51%) specifying that coaching staff did not formally review the data, and 23 (49%) stating that they did (Figure 3). Those who selected yes were asked to state how regularly coaching staff reviewed the data, with weekly (8; 35%) being the most common, followed by annually (6; 26%), daily (3; 13%), other (4;

17%), and monthly (2; 9%). All four who specified other stated differing timescales: “three times a season”, “every 6 weeks”, “post pre-season and post-season”, and “spontaneous”.

Figure 3 near here

Finally, when asked to the best of their knowledge how much consideration is given to player injury data when deciding whether to recruit, retain or release an individual the majority of practitioners selected some (24; 51%). This was followed by very little (15; 32%), a lot (7; 15%), and not sure (1; 2%), with no one selecting none or considered critical.

DISCUSSION

The present study is the first to investigate the injury data collection procedures, perceived value and use of such data within professional football academies. The findings revealed that qualified medical professionals conduct the majority of injury data collection procedures; indicating the injury diagnoses are likely of high quality. All applied practitioners considered injury data important and the majority (79%) also believe using it for academic research is worthwhile. Injury data are used to inform injury prevention strategies within the majority (88%) of academies; however, they are often not used to guide financial investment within medical departments. While medical staff formally review injury data in the majority of academies (87%), half of the respondents indicated that coaching staff do not.

Data collection procedures

All respondents indicated that injury data are collected within their respective academy. The majority (83%) of respondents reported qualified physiotherapists are responsible for this record keeping, and that clinical diagnoses are made for each injury, suggesting that the injury diagnoses are of high quality. Similarly, the majority (79%) of academies also collect data pertaining to player illness; indicating that current practice encompasses a comprehensive monitoring system for player health.

Perceived value

All respondents either strongly agreed or agreed that collecting injury data within their academy was important. This is encouraging and suggests that applied practitioners understand the value of high quality and consistent injury records in the context of the sequence of prevention described by van Mechelen et al. (1992). When asked to justify why they felt collecting injury data was important, numerous explanations were provided with central themes surrounding using data to inform future preventive strategies and to judge the effectiveness of current training practices emerging (Table 3). These opinions are in concordance with those of UEFA and the Fédération Internationale de Football Association (FIFA) (D'Hooghe 2016).

The majority (79%) of respondents answered that they felt sharing/using their academy's injury data for academic research was worthwhile and important. This is somewhat at odds with the scarcity of epidemiological studies in elite youth football within the scientific literature (Pfirrmann et al. 2016). However, that so many applied practitioners believe that collaborating with academic researchers is of value bodes well for future investigations. Ekstrand (2016) highlighted the benefits of multicentre collaboration in the context of

399 football injury research. The most immediate benefit of academies potentially pooling their
400 injury data is that the sample size and the resultant number of injury cases increases;
401 however, other benefits to multicentre collaboration also exist, such as better quality control
402 in terms of data collection procedures (Impellizzeri 2017). Larger sample sizes are hugely
403 beneficial since approximately 200 injury cases are required to detect small to moderate
404 associations between risk factors and injuries (Bahr & Holme 2003).
405
406 Another advantage to professional academies collaborating with academic researchers is the
407 fulfillment of the "Working fast and working slow" model of high performance outlined by
408 Coutts (2016). One of the tenets of this model is that researchers (so called 'slow thinkers')
409 can help provide applied practitioners (so called 'fast thinkers') with evidence-based
410 solutions for problems they themselves may not have the time or expertise to address (Coutts
411 2016). Since half of the respondents stated a lack of time as the major obstacle limiting the
412 use of their injury data for research purposes, such collaboration between professional
413 academies and researchers may benefit academies. However, the second most cited obstacle
414 to using injury data for research purposes was that the academy did not want to share their
415 data with external partners (presumably fearing the loss of a competitive advantage). This
416 highlights the importance of academic researchers building personal relationships with
417 applied practitioners and other key stakeholders within professional academies in an attempt
418 to establish trust and allay some of the fears related to data sharing. Furthermore, long-term
419 and sustainable collaboration between professional academies and universities may benefit
420 from relationships and agreements at an organisational level rather than simply between
421 individual practitioners and researchers. While some organisations may be concerned about
422 sharing data from an ethical/legal perspective, anonymising of raw data and ensuring
423 researchers are blinded to sensitive information may be a potential solution.

Use and application

A majority (88%) of the respondents either strongly agreed or agreed that the injury data collected informed their prevention strategies. However, elucidating exactly *how* practitioners use their injury data to inform the prevention strategies implemented was beyond the scope of this survey. Nonetheless, the respondents' answers suggest evidence based practice is apparent within the majority of professional academies.

Half of the respondents stated that injury data collected within their academy was not used to inform financial investment within the medical/S&C/sport science department highlighting a potential disconnect between the reality of the challenges faced by support staff and academy hierarchies. It should be acknowledged that in some cases, the applied practitioners who responded to this survey may not have been fully informed with regard to financial decisions taken at the board/managerial level. Nonetheless, the fact that half of the respondents do not perceive that injury data is used to inform decision-making from a financial perspective highlights an undesirable disconnect between support staff and academy hierarchies. The cost of individual injuries at the highest professional level has been estimated at ~€500,000 per month (Ekstrand 2013). An obvious difference between senior professional and academy level football players is the discrepancy in financial remuneration received. However, despite the possible lack of 'lost wages' in the case of academy players, a significant monetary burden may still exist due to the immediate cost of medical treatment and potentially the loss/reduction of eventual player sell-on value. Ergo, it is in the financial interest of professional academies to reduce the incidence and severity of injuries suffered by their players. Presumably the greatest value for money will not be achieved in relation to

449 investment within the medical/S&C/sport science department without taking into account the
450 challenges they face, or in other words; considering the incidence of injury experienced
451 within ones own environment. Greater financial investment within a medical department does
452 not necessarily equate to improved injury related outcomes. Indeed, well-funded and staffed
453 medical departments may conversely appear to perform worse than others due to superior
454 detection and reporting of injury cases. Before decisions surrounding investment are made a
455 clear understanding of the key performance indicators and objectives of the medical
456 department should be established. Furthermore, injury data need not determine whether a
457 medical department receives more or less funding but rather *how* that money is spent.
458
459 While the majority (87%) of respondents indicated that medical staff formally reviewed the
460 collected injury data, half reported that coaching staff did not. This is a portentous finding
461 since coaches potentially have a significant influence on injury incidence since they typically
462 lead the design and delivery of training sessions. If coaches are not aware of the types or
463 typical patterns of injury experienced by their players then designing training sessions that
464 attempt to mitigate potentially relevant factors is unlikely.
465
466 A third of respondents stated that very little consideration was given to player injury data
467 when deciding whether to recruit/retain/release an individual. A recent injury prevention
468 model proposed that player recruitment and list management was the "first building block in
469 the injury prevention pyramid" (Coles 2017). Previous injury is well accepted as a significant
470 risk factor for future injury (Arnason et al. 2004; Hägglund et al. 2013a). As a result, it makes
471 intuitive sense to give some consideration to injury data when recruiting players in an attempt
472 to build a squad of injury resilient individuals with limited previous history (Coles 2017).
473

Limitations

Some limitations with regard to the present study exist. Of the 47 respondents, 34 (72%) represented academies from either England or Germany. As a result, the conclusions drawn are most generalizable to those two countries. The respondents represented a number of different roles ranging from fitness coach to director of performance. This range of perspectives may have influenced the responses since it is conceivable that the information available to those occupying these various levels of seniority may differ. That seven countries were represented in the present cohort of respondents also means that readers should be cognizant of the differing sporting cultures that likely exist in each one and may have influenced the interpretation of some of the survey questions. However, the international nature of this study is also a positive aspect and provides a wide overview of academy injury data collection practices worldwide. Similarly, the present study is purely descriptive in nature with results largely based on the opinion of the respondents. Objective quantification relating to some of the questions would improve and enhance the veracity of the conclusions made. When invited to partake in the study, practitioners were made aware of the topic. Therefore, it is acknowledged that the respondents who chose not to complete the survey may not have had an interest in, or considered important, the issue of injury data collection within the academy setting, potentially skewing our findings. An element of selection bias will be present since applied practitioners who are not interested in injury data or its use would understandably have been less inclined to take part in the survey.

CONCLUSION

The results of the present survey revealed a number of encouraging findings; however there also appears to be scope for practice to be improved. Qualified medical professionals conduct the majority of injury data collection procedures within academies; indicating the injury diagnoses are likely of high quality. In addition, the majority (79%) of applied practitioners feel that it is important to use their injury data for academic research purposes yet most cited barriers related to lack of time and reluctance from the academy to share information with external partners. This is of concern since a lack of access to such data will inhibit researchers attempting to satisfactorily answer questions related to injury epidemiology/prevention in high-level youth populations. Academies not opposed to engaging with external partners should consider formally allocating some of their employees' time to academic research. Senior academy decision-makers may wish to consider taking into account their own injury data when reviewing financial investment in their academies. Understanding the types and incidence of injuries experienced by their players could potentially lead to superior value for money through more efficient spending. That half of respondents indicated coaching staff do not formally review injury data is concerning since coaches are arguably the best placed individuals within the academy to implement strategies aimed at reducing injury rates.

ACKNOWLEDGMENTS

The authors would like to thank all of the survey respondents for their insights. In addition the authors thank **blinded for peer review** for their help in contacting potential participants.

DISCLOSURE STATEMENT

The authors reported no potential conflicts of interest.

REFERENCES

Arnason A, Sigurdsson SB, Gudmundsson A, Holme I, Engebretsen L, Bahr R. 2004. Risk factors for injuries in football. *Am J Sports Med*. 32:5-16.

Bahr R, Holme I. 2003. Risk factors for sports injuries—a methodological approach. *Br J Sports Med*. 37:384-392.

Coles PA .2017. An injury prevention pyramid for elite sports teams. *Br J Sports Med*. Advance online publication. doi:10.1136/bjsports-2016-096697

Coutts AJ. 2016. Working fast and working slow: the benefits of embedding research in high performance sport. *Int J Sports Physiol Perform*. 11:1-2.

547 Cresswell JW, Miller DL. 2000. Determining validity in qualitative enquiry. *Theory Pract*.
548 39:124-130.
549
550 D'Hooghe M. 2016. Why is UEFA carrying out injury studies? *Br J Sports Med*. 50:707.
551
552 Ekstrand J. 2013. Keeping your top players on the pitch: the key to football medicine at a
553 professional level. *Br J Sports Med*. 47:723-724.
554
555 Ekstrand J. 2016. Preventing injuries in professional football: thinking bigger and working
556 together. *Br J Sports Med*. 50:709-710.
557
558 Ekstrand J, Hägglund M, Waldén M. 2011. Injury incidence and injury patterns in
559 professional football: the UEFA injury study. *Br J Sports Med*. 45:553-558.
560
561 Ekstrand J, Waldén M, Hägglund M. 2016. Hamstring injuries have increased by 4%
562 annually in men's professional football, since 2001: a 13-year longitudinal analysis of the
563 UEFA Elite Club injury study. *Br J Sports Med*. 50:731-737.
564
565 Fuller CW, Ekstrand J, Junge A, Andersen TE, Bahr R, Dvorak J, Hägglund M, McCrory P,
566 Meeuwisse WH. 2006. Consensus statement on injury definitions and data collection
567 procedures in studies of football (soccer) injuries. *Scand J Med Sci Sports*. 16:83-92.
568
569 Hägglund M, Waldén M, Ekstrand J. 2013a. Risk factors for lower extremity muscle injury in
570 professional soccer: the UEFA injury study. *Am J Sports Med*, 41:327-335.
571

572 Hägglund M, Waldén M, Magnusson H, Kristenson K, Bengtsson H, Ekstrand J. 2013b.
573 Injuries affect team performance negatively in professional football: an 11-year follow-up of
574 the UEFA Champions League injury study. *Br J Sports Med*. 47:738-742.
575
576 Harper LD, McCunn R. 2017. "Hand in Glove": Using qualitative methods to connect
577 research and practice. *Int J Sports Physiol Perform*. 12:990-993.
578
579 Impellizzeri FM. 2017. Together we are stronger: multicenter studies. *Int J Sports Physiol*
580 *Perform*. 12:141.
581
582 McArdle S. 2010. Psychological rehabilitation from anterior cruciate ligament-medial
583 collateral ligament reconstructive surgery: a case study. *Sports Health*. 2:73-77.
584
585 McCunn R, Sampson JA, Whalan M, Meyer T. 2016. Data collection procedures for football
586 injuries in lower leagues: Is there a need for an updated consensus statement? *Science and*
587 *Medicine in Football*. 1:86-88.
588
589 Øiestad BE, Engebretsen L, Storheim K, Risberg MA. 2009. Knee osteoarthritis after anterior
590 cruciate ligament injury: a systematic review. *Am J Sports Med*. 37:1434-1443.
591
592 Patton M. 2015. Qualitative research and evaluation methods. Thousand Oaks, CA: Sage.
593
594 Pfirrmann D, Herbst M, Ingelfinger P, Simon P, Tug S. 2016. Analysis of injury incidences
595 in male professional adult and elite youth soccer players: A systematic review. *J Athl Train*.
596 51:410-424.

Richardson D, Gilbourne D, Littlewood M. 2004. Developing support mechanisms for elite young players in a professional soccer academy: Creative reflections in action research. *Eur Sport Manag Q*. 4:195-214.

Thomas D. 2006. A general inductive approach for analyzing qualitative evaluation data. *Am J Eval*. 27:237-246.

Ueblacker P, Müller-Wohlfahrt HW, Ekstrand J. 2015. Epidemiological and clinical outcome comparison of indirect (‘strain’) versus direct (‘contusion’) anterior and posterior thigh muscle injuries in male elite football players: UEFA Elite League study of 2287 thigh injuries (2001-2013). *Br J Sports Med*. 49:1461-1465.

van Mechelen W, Hlobil H, Kemper HC. 1992. Incidence, severity, aetiology and prevention of sports injuries. A review of concepts. *Sports Med*. 14:82-99.

APPENDIX 1

How do professional football academies collect and use player injury data?

Personal information

Club:

Position within the organization (job title):

Collection procedures

1. Are player injury data collected in any form?

   - *Yes*
   - *No*

2. If the answer to question 1 is '*Yes*'; who primarily records the data?

   - *Medical doctor*
   - *Qualified physiotherapist*
   - *Qualified physical therapist*
   - *S&C coach/sport scientist*
   - *University student*
   - *Player (self-recording)*
   - *Coach*
   - *Other*

3. If the answer to question 1 is '*Yes*'; are all physical complaints documented or only time-loss injuries (i.e. those that result in missed training/match play)?

   - *All physical complaints are documented*
   - *Only time-loss injuries are documented*

4. Are player illness (e.g. cold/flu, gastrointestinal complaints) data collected in any form?

   - *Yes*
   - *No*

5. If the answer to question 1 is '*Yes*'; is a clinical diagnosis made for each injury case or is the information gathered limited to reporting of general location and symptoms only? (By "clinical diagnosis" we mean: are medical/anatomical terminology used and is the diagnosis based on reported symptoms rather than laboratory testing)

   - *A clinical diagnosis is made for each injury case*
   - *Location/symptoms are recorded but a clinical diagnosis is not made for each injury case*

6. If the answer to question 5 is '*A clinical diagnosis is made for each injury case*'; are diagnoses made by a medical doctor/physiotherapist?

- *Yes (medical doctor/physiotherapist)*
- *No (other personnel)*

Perceived value

7a. How much do you agree with the following statement?

"Collecting player injury data within the academy is important"

Strongly disagree Disagree Neither agree or disagree Agree Strongly agree

7b. Please, justify your answer to question 7a: Why do you hold this point of view?

Answer:

8a. How much do you agree with the following statement?

"Sharing/using our injury data for academic research purposes is worthwhile and important"

Strongly disagree Disagree Neither agree or disagree Agree Strongly agree

8b. What is the primary obstacle (if there is one) preventing/limiting the use of your injury data for academic research?

- *The club does not want to share their data with external partners (e.g. universities/other clubs)*
- *Lack of time/staff resources*
- *We (club staff) are unsure how the data could best be used from a research perspective*
- *There is no immediate benefit/competitive advantage to engaging in academic research (therefore no incentive to do so)*
- *Other reasons*

Use and application

9. How much do you agree with the following statement?

"The player injury data collected within the academy are used to inform our injury prevention strategies"

Strongly disagree Disagree Neither agree or disagree Agree Strongly agree

10. How much do you agree with the following statement?

"The player injury data collected within the academy are used to guide financial investment within the medical/strength & conditioning/sport science department(s)"

Strongly disagree *Disagree* *Neither agree or disagree* *Agree* *Strongly agree*

11a. If the answer to question 1 is '*Yes*'; do club medical staff formally review the player injury data? If '*Yes*', please specify how regularly.

- *Yes*
- *No*

11b. How regularly:

- *Daily*
- *Weekly*
- *Monthly*
- *Annually*

12a. If the answer to question 1 is '*Yes*'; do club coaching staff formally review the player injury data? If '*Yes*', please specify how regularly.

- *Yes*
- *No*

12b. How regularly:

- *Daily*
- *Weekly*
- *Monthly*
- *Annually*

13. To the best of your knowledge, how much consideration is given to player injury data when deciding whether to recruit, retain or release an individual?

None *Very little* *Some* *A lot* *Considered critical*

FIGURE CAPTIONS

Figure 1. Responses to the question: "How much do you agree with the following statement? Sharing/using our injury data for academic research purposes is worthwhile and important."

Figure 2. Responses to the question: "How much do you agree with the following statement? The player injury data collected within the academy are used to guide financial investment within the medical/strength & conditioning/sport science department(s)."

Figure 3. Responses to the questions: "Do club medical staff formally review the player injury data?" and "Do club coaching staff formally review the player injury data?"

TABLES

Table 1 Practitioner role within their professional academy

Role	*n*
Sport Scientist	18
Head of Academy Sport Science/Sport Medicine	8
Fitness Coach	7
Director of Performance	5
Physiotherapist	5
Strength and Conditioning Coach	4

Table 2 League and competitive level of practitioners

League and Level	*n*
English Championship (second tier)	9
German Bundesliga (first tier)	8
English Premier League (first tier)	7
English League One (third tier)	5
German 2nd Bundesliga (second tier)	5
Scottish Premiership (first tier)	4
Major League Soccer (first tier)	3
Scottish Championship (second tier)	3
National Football Association Academy	1
Portuguese Primeira Liga (first tier)	1
Australian A-League (first tier)	1

Table 3 General dimensions (bold) with quotes to support why collecting injury data is important

Identify patterns and common injuries: *"looking for trends that are a possible contributor to injury"; "if a large number of hamstring injuries are reported over a short space of time, it will prompt staff to look into any potential influences to this injury data"; "what type of injuries occur and at which events (match/training etc.)"*
Player history: *"to have a comprehensive log of a player's injury history will help support and develop a player into the first team"; "give the club a detailed history of each individual's response to different types and intensities of load"; "provides a player history that can be used to protect the player"*
Training effectiveness: *"this is how we evaluate the effectiveness of our programming – are players able to tolerate the work asked of them?"; "to find out how/if prevention methods help to avoid injuries"; "how training loads, maturation, injuries and performance interact and how it may help us better comprehend and evaluate the current training practices within our academy"*
Ethics/Legality: *"care of duty"; "legal requirement"; "personal protection"; "liability and player health/wellbeing"*
Reduce injury risk: *"prevent future injury"; "understanding how and why potential injuries happen can help us reduce the risk of them occurring"*
Inform training strategies: *"the aim is to work out the best preventive strategies you can get"'; "because we need all data of the development of the player to build an individual program in training": "help optimise injury prevention training design"*
Time loss: *"determine individual and team time loss from training/matches through injury; "player availability is critical to the player's development therefore we must have appropriate tools and databases to monitor this"; "monitor days missed"*
Between squads: *"we have a very close relationship with the first team and the national team – it's important to share injury reports with them before they join other teams training sessions/camp and after"; "it is important to have an overview concerning all teams, and it is helpful to see any tendencies in each team and across all teams"*
Return to play: *"it allows us to gauge how far off a player is from returning to play"; "it is crucial as it allows coaches to be able to compare and contrast between the data recorded when the player is injured and when the player has returned to play once again"*