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An audit of injuries among elite Malaysia U19 and U22 league soccer players

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ABSTRACT

Background: Knee injuries are the most common injury among Malaysian elite athletes. However, an injury profile of elite soccer players in Malaysia is yet to be determined.

Aim and Objectives: This study was conducted to determine the injury characteristics among elite, male U19 and U22 soccer players.

Materials and Methods: Four teams were observed throughout the 2018/2019 season, where a total of 111 players were documented in accordance with the Federation International de Football Association Medical and Research Centre accord to determine the incidence, class, severity and causation of injuries among elite, male U19 and U22 soccer players.

Results: From a total of 111 players (U19: $n = 58$; U22: $n = 53$) during the 2018–2019 season, a sum of 64 injuries were reported to the team physicians of the participating teams in the current study, representing an estimated 0.58 injuries per player throughout a single season. From the total number of injuries, 57.8% ($n = 37$) injuries were registered to the U22 age group, whereas 42.2% ($n = 27$) were reported in the U19 Age Group. When factoring in the number of players in each respective age group, the number of injuries among the U22 age group was higher than the U19 age group (0.72 vs. 0.47 injuries/player/season).

Conclusion: Most soccer injuries reported were lower limb injuries, newly sustained and required up to 14 days of treatment before returning to full participation in the competition. Match-play injuries appeared to be more common than training injuries, with the ankle and knee joints being the most common injury locations. Sprains and ligamentous damage were the most common injury class sustained by players.

Key Words: Federation International de Football Association Medical and Research Centre, injury prevalence, soccer

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INTRODUCTION

Soccer is played in many countries and at numerous different levels Federation International de Football Association (FIFA). It is a sport so popular that by the end of the 20th century, soccer has already had an estimated 40 million people playing the game

(Bjordal et al., 1997), and by the dawn of the 21st century, the FIFA has recorded over 265 million registered players (Herrero et al., 2014). With an increasing participation in soccer worldwide, soccer has been responsible to many injuries regardless of playing

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level. The knee injury is the most common soccer-related injury, with the Anterior Cruciate Ligament (ACL) injury stealing the spotlight more often than other injuries (Waldén *et al.*, 2011a). In the study of over 57 soccer clubs, 76 ACL injuries, with an additional two ACL re-injuries, accounted for almost 15% of all knee sprains, 90% of these injuries led up to ACL reconstruction surgery (Waldén *et al.*, 2011a). This is a concerning matter as such injuries are feared by players as it might bring an abrupt ending to a promising career (Bjordal *et al.*, 1997).

With the rise in sports injury incidences associated with soccer, the FIFA Medical Assessment and Research Centre (F-MARC) was instituted to protect the health of soccer players in all levels by providing evidence-based information to facilitate the decision-making processes for soccer promotion by FIFA and the International Football Association Board. Many epidemiological studies of injuries sustained in soccer have been conducted with some intriguing findings. In several European countries, the injuries were found to be more prevalent during matches than during practices (Hawkins *et al.*, 2001; Herrero *et al.*, 2014; Waldén *et al.*, 2011a). In a more specific exploration of ACL injuries during soccer, it was found that although injuries tend to occur more during competitive match-play, the nature of the injuries is more often non-traumatic (Waldén *et al.*, 2011a). This information is crucial as non-traumatic injuries are almost exclusively addressed in structured injury prevention programmes.

Previous similar studies do exist for soccer, but each study targeted different populations such as the Spanish (Herrero *et al.*, 2014), the Swedish and European (Waldén *et al.*, 2011a), the Norwegian (Bjordal *et al.*, 1997), and other populations including the Japanese (Aoki *et al.*, 2012). However, the current existing literature on sports-related injury in Malaysia is very limited. The closest known literature on a Malaysian audit of injuries was the study on futsal injuries in 2010 (Hamid *et al.*, 2014). In a Malaysian setting, there is a trend of similarities in injury occurrence among elite athletes. The knee is the most common injury region, with ligament sprains front running the injury class (Hamid *et al.*, 2014; Wahab *et al.*, 2015). To our knowledge, there is yet to be a specific audit of injuries among the soccer players in the country. The lack of information on the prevalence and causations of injuries in the Malaysian soccer setting may have a toll on the efficacy of injury-prevention intervention programmes planned out for the players. This is because the first stage in injury prevention is to identify the extent of the issue (i.e., occurrence of ACL injury) so that the mechanisms and factors underlying the occurrence can be identified for preventive strategies introduction (Hawkins *et al.*, 2001). Hence, there is a need to establish a comprehensive epidemiological study of the injuries in Malaysian professional soccer. This study approaches this need using a cross-sectional epidemiological study on the injuries in Malaysian professional soccer, thus, being the first study to report on soccer injuries in the Malaysian professional soccer setting.

The aim of this study was to determine the frequency, class, gravity and nature of injuries among Malaysian elite U19 and

U22 soccer players. Furthermore, this study aims to quantify the prevalence of ACL injuries suffered among Malaysian elite U19 and U22 soccer players.

METHODS

Study design

All soccer players registered to a club belong to a mutual benefit administration that provides medical assistance to all soccer players suffering from physical drawbacks from soccer practices. In a descriptive epidemiological study design, this study was an audit of injuries overall injuries resulting from soccer practices and matches reported to the team medical personnel. The team medical personnel were demonstrated on filling out the survey and report of injuries that they treated during the season. A recordable injury was defined as mentioned in previous publications (Football Association of Malaysia, 2019; Herrero *et al.*, 2014).

Participants

The population observed in this study consisted of the players playing in two of the tournaments registered under the Football Association of Malaysia, namely the President's Cup (Under-21) and the Youth Cup (Under-19). A competing team must have a minimum of 18 players to participate in the age group or open competitions (Football Association of Malaysia, 2019). A convenience sample of two teams was audited for both tournaments. Therefore, a minimum of 72 players were observed throughout the two competitions' periods. Information of injuries sustained by players were collected using the Injury Audit Questionnaire.

Injury audit questionnaire

The Injury Audit Questionnaire [Appendices A-D] was based on the accord document for epidemiological research in soccer (Fuller *et al.*, 2006) as adapted by the F-MARC (Herrero *et al.*, 2014). The document indicates methods for injury information registration and specifies clear definitions of injuries and characteristics for their categorization in terms of area, class, diagnosis and nature (Herrero *et al.*, 2014).

Data collection procedures

In a cross-sectional epidemiological study of Malaysian elite U19 and U22 soccer players of the 2018–2019 tournaments, the medical personnel recorded injury data on a player's IAQ when a player required the attention of the event physician. The injuries were assessed by two physicians, while the verdict of a third was obtained if the two physicians contradicted on the diagnosis. Several computable information was included for the data recording (Herrero *et al.*, 2014).

Recurrent injury

Injuries of the same nature and at the same body location as a previously sustained injury were categorised as a recurrent injury. Other injuries were categorised as new injuries. Notwithstanding, the interval between injury repeats was not being represented in the survey.

Injury severity

The severity of the injury was categorised based on the number of days that passed since the date of injury until the date of the player's reappearance to complete participation to soccer. Injuries were grouped as slight (<7 days), mild (7–14 days), moderate (15–21 days) and severe (21 days). This categorisation was unconstrained to the class of injury because an injury that required medical attention (which did not impede ensuing soccer training or match) may have required a sum of days or weeks to be rehabilitated properly (e.g., a fractured finger).

Injury classification

The injuries were categorised using a modified form of the Orchard Sports Injury Classification System (Pérez et al., 2008). The survey had specific items to pinpoint the body location and side of the injury, class and mechanism. Furthermore, the survey items were split to differentiate traumatic injuries (damage sustained from a certain and recognisable incident in training or a match) from overuse injuries (when the damage was unrelated to any recognisable incident).

Injury conditions

Specifications to whether the injury was sustained during match-play or while training and whether it was an outcome of an accident with a different player was included.

Statistical analyses

All data on the surveys were recorded in an archive and associated software (SPSS Inc, Chicago, Illinois, USA), which allowed cross-tabulation of the items specified. Absolute and relative frequencies were formulated for the study sample and injury for each item. Cross-tabulation of data and the Chi-square (χ^2) test were used to investigate the differences between age groups (U19 and U22) with alpha (α) set at 0.05.

RESULTS

Four teams participated in this study, accounting for 111 players (U19: $n = 58$; U22: $n = 53$). During the 2018–2019 season, a total of 64 injuries were reported to the team physicians of the participating teams in this study, representing an estimated 0.58 injuries per player throughout a single season. From the total number of injuries, 57.8% ($n = 37$) were reported in the U22 age group, whereas 42.2% ($n = 27$) were reported in the U19 age group. When factoring in the number of players in each respective age group, the number of injuries among the U22 age group was higher than the U19 age group [0.72 vs. 0.47 injuries/player/season; Table 1].

From the collective number of injuries reported in this study, 54.7% ($n = 35$) occurred due to contact with another player, while the remaining 45.3% ($n = 29$) were non-contact in nature. Most of the injuries reported in this study were unrelated to a previous medical condition (92.2%; $n = 59$). Only a small fraction was identified as recurring injuries (7.8%; $n = 5$). More than half of the injuries occurred in competitive match-play conditions

Table 1: Primary traits of injuries reported in elite soccer players during the 2018-2019 season^a

	U19 age group	U22 age group	P
Total number of injuries reported	27	37	
Number of injuries/player/year	0.47	0.72	
Nature of injury			
Contact	18 (66.7)	17 (45.9)	>0.05
Noncontact	9 (33.3)	20 (54.1)	>0.05
Recurrent injuries			
Yes	3 (11.1)	2 (5.4)	>0.05
No	24 (88.9)	35 (94.6)	>0.05
Injury conditions			
Match	17 (63)	23 (62.2)	>0.05
Training	10 (37)	14 (37.8)	>0.05
Injury severity			
Slight	5 (18.5)	10 (27)	>0.05
Mild	12 (44.4)	17 (45.9)	>0.05
Moderate	3 (11.1)	4 (10.8)	>0.05
Severe	7 (25.9)	6 (16.2)	>0.05
Playing position			
Goalkeeper	3 (11.1)	N/A	<0.05
Defender	11 (40.7)	15 (40.5)	>0.05
Midfielder	10 (37)	14 (37.8)	>0.05
Striker	3 (11.1)	8 (21.6)	>0.05

^aValues are expressed as n (%). N/A: Not available

(62.5%; $n = 40$), whereas others were reported to be sustained during training (37.5%; $n = 24$). Many of the injuries reported were classified as mild injuries (45.3%; $n = 29$), requiring 1–2 weeks of treatment before returning to full participation in training and competition. This was followed by slight injuries (23.4%; $n = 15$), requiring <1 week of treatment, severe injuries (20.3%; $n = 13$), which required over 3 weeks of treatment and moderate injuries (10.9%; $n = 7$), which required 2–3 weeks of treatment before returning to full participation. No significant difference was observed between age groups in all injury characteristics ($P > 0.05$). Defenders and midfielders had the most injuries throughout the season (40.6% and 37.5%, respectively). There was no statistically significant difference between injury occurrences based on playing positions when compared between age groups except for between goalkeepers (3 vs. 0; $P < 0.05$).

Table 2 depicts the categorisation of the soccer injuries recorded in this study with respect to their body locations. Primary categories were used to separate injuries among the most important body locations and to categorise and enhance the specificity of injury localisation. The largest fraction of injuries occurred in the lower limb region; the ankle (31.3%, $n = 20$), knee (20.3%, $n = 13$) and thigh (18.8%, $n = 12$) were the most common injury locations. There appeared to be no difference in injury occurrence between the right and left limbs ($P = 0.529$). However, the thigh and low back injuries seem to have significant differences when compared between the two age groups [$P < 0.05$; Figure 1].

Table 3 depicts the classes of all soccer injuries recorded in this study and their occurrence in elite U19 and U22 soccer. Joint and ligament injuries were the most common injury class, with ligament injuries and joint sprains accounting for almost half of

Table 2: Body locations for 64 injuries in elite U19 and U22 soccer players during the 2018-2019 season

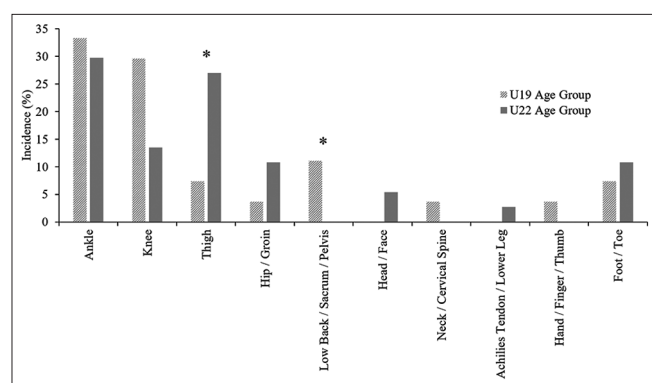
Main grouping	Incidence, n (%)	Category	Incidence, n (%)	P
Head and neck	3 (4.7)	Head/face	2 (3.1)	>0.05
		Neck/cervical spine	1 (1.6)	>0.05
Upper limb	1 (1.6)	Shoulder/clavicle	N/A	N/A
		Upper arm	N/A	N/A
		Elbow	N/A	N/A
		Forearm	N/A	N/A
		Wrist	N/A	N/A
		Hand/finger/thumb	1 (1.6)	>0.05
		Trunk	8 (12.5)	Sternum/ribs/upper back
		Abdomen	N/A	N/A
		Low back/sacrum/pelvis	3 (4.7)	<0.05
		Hip/groin	5 (7.8)	>0.05
Lower limb	52 (81.3)	Thigh	12 (18.8)	<0.05
		Knee	13 (20.3)	>0.05
		Achilles tendon/lower leg	1 (1.6)	>0.05
		Ankle	20 (31.3)	>0.05
		Foot/toe	6 (9.4)	>0.05

N/A: Not available

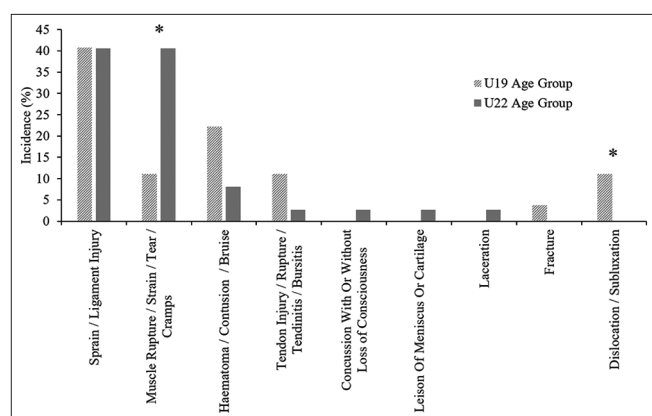
Table 3: Classes for 64 injuries in elite U19 and U22 soccer players during the 2018-2019 season

Main grouping	Incidence, n (%)	Category	Incidence, n (%)	P
Fracture and bone stress	1 (1.6)	Fracture	1 (1.6)	>0.05
		Other bone injury	N/A	N/A
Joint and ligament	30 (46.9)	Dislocation/subluxation	3 (4.7)	<0.05
		Sprain/ligament injury	26 (40.6)	>0.05
		Lesion of meniscus or cartilage	1 (1.6)	>0.05
Muscle and tendon	22 (34.4)	Muscle rupture/strain/tear/cramps	18 (28.1)	<0.05
		Tendon injury/rupture/tendinitis/bursitis	4 (6.3)	>0.05
Contusions	10 (15.6)	Hematoma/contusion/bruise	9 (14.1)	>0.05
		Abrasion	N/A	N/A
		Laceration	1 (1.6)	>0.05
		Concussion with or without loss of consciousness	1 (1.6)	>0.05
Nervous system	1 (1.6)	Nerve injury	N/A	N/A
		Other injuries	N/A	N/A

N/A: Not available

**Figure 1: Body locations for injuries reported in elite U19 and U22 soccer players. *Denotes significant difference between age**

the total injuries (40.6%; $n = 26$). Muscle and tendon injuries were also a common class of injuries, making up slightly over a third of the total injuries (34.4%; $n = 22$). When compared between age groups, there appears to be a significant difference in injury incidences for 'dislocation/subluxation' and 'muscle rupture/strain/tear/cramps' categories [$P < 0.05$; Figure 2].

**Figure 2: Injury classes in elite U19 and U22 soccer players. *Denotes significant difference between age groups**

DISCUSSION

Epidemiological data documenting injury characteristics have been in elite athletes in Malaysia have been established. The unfortunately, literature regarding the rate of injury in soccer is

limited. The aim of this study was to report injury characteristics among elite U19 and U22 male soccer players in Malaysia. The midfielders with foot and toe injuries and strikers with ankle injuries are tied together as the most common combination of injury characteristics. Most injuries may be newly sustained injuries, occur during match-play and require 7–14 days of treatment. This information may benefit the medical operatives specialising in the soccer as injury management may be costly to the players' associations depending on the injury. For example, the cost for surgical treatments for severe injuries may sum up to ten-thousands of Malaysian ringgits (Brophy *et al.*, 2009).

The association between playing position and rate of injury has been reported in previous studies worldwide (Aoki *et al.*, 2012; Azubuike and Okojie, 2009; Carling *et al.*, 2010; Hawkins and Fuller, 1998; Sandelin *et al.*, 1985). Naturally, goalkeepers represented the least fraction of injuries from the total reported injuries (Aoki *et al.*, 2012; Herrero *et al.*, 2014; Sandelin *et al.*, 1985). While the defenders in this study make the majority of the fraction of player injuries, midfielders build a relatively close fraction to the amount and correspond to a previous study (Herrero *et al.*, 2014). The close similarities in injury incidence rates between the midfielders and defenders may be attributable to the nature of most of the reported injuries in this study (contact injuries).

Most injuries occurred during player-player contact, whereas player-ball and player-goalpost were almost non-existent throughout the course of the study duration. This finding coincides with several previous observations (Junge and Dvorak, 2004), which specifically mentioned that the incidence rate of contact injuries may increase significantly during higher-profile matches. This pattern of injury incidence rate also coincides with that observed in futsal, which is a smaller variant of soccer as previously reported (International Federation of Football Association, 2014; Hamid *et al.*, 2014). Given this observation, it is understandable to have the ankle as the most commonly injured body part in this study, as, unlike futsal's stricter rules, side-tackling is allowed and the gameplay is more robust and comes with more aggressive body contact (International Federation of Football Association, 2014). Moreover, the ankle was also reported as a popular injury location in soccer during matches and training (Fuller *et al.*, 2007a; 2007b). Furthermore, this study observed the injury incidence rates among elite players; hence, it makes more sense that there would be greater chances of collision between the players as the pace of the game may be faster (Junge *et al.*, 2004; van Beijsterveldt *et al.*, 2015) than amateur players (Herrero *et al.*, 2014). This may also be supported by the overall incidence rate of injury in this study, which was arguably higher than that observed in among amateur players (Herrero *et al.*, 2014) (0.58 vs. 0.11) and was consistent with their observation that higher-level athletes face a higher rate of injury incidence per season. On a more crucial note, non-contact injuries have been reported to be the more predominant nature in soccer (Hawkins *et al.*, 2001). While the main nature of injury in this investigation is contact in nature, non-contact injuries built up almost a similar portion of injuries throughout the course of this study. It has been

speculated that non-contact injuries may be attributed to several mechanisms such as playing surface as well as physiological and biomechanical adaptations to exertions (Griffin *et al.*, 2000).

Of particular interest to this study, knee ligament injuries make up more than half of the knee injuries reported (53.8%; $n = 7$), with four confirmed diagnosis of ACL tears. This partially supports epidemiological data elsewhere highlighting the predominance of ACL tears in soccer (Brophy *et al.*, 2010b; Waldén *et al.*, 2011a; 2011b).

No statistically significant difference was found between the injury rates of the left and right limbs. This supports previous studies that noted indifferences in the injury rate between limb sides (Borotikar *et al.*, 2008). This finding also supports previous investigations on the biomechanical observations of injury risk in both limbs (Hamdan *et al.*, 2018a; 2018b). However, this finding contradicts observations where male soccer athletes exhibited a tendency to be injured in their dominant limb (Brophy *et al.*, 2010a). This discrepancy may be explained by the difference in the classification of limbs between both studies (left and right vs. dominant and non-dominant). Limb dominance was not identified in for the context of this current investigation and has detrimental differences during the cross-tabulation of data.

Limitation

Several limitations should be brought to attention in this study. First, this study only observed a small sample size ($n = 111$) using convenience sampling throughout a 1-year period as compared to other studies with thousands of players over several years. Furthermore, the presented data were only that of the reported injuries among male soccer players recorded by the teams' medical personnel. Thus, a comparison between male and female injury incidence rates cannot be made and demands exploration (Herrero *et al.*, 2014). The injury data were only recorded when a player required the medical attention of the teams' medical personnel during matches or training. Injuries that occurred outside these sessions and those self-treated by the players may be missed. In addition, the age groups observed in this study were only limited to U19 and U22 age groups and may not be a complete representation of the soccer injury incidence scenarios in Malaysia, where participation is fulfilled at more varied ages. Furthermore, injury rates were only calculated with respect to the total number of players observed, regardless of the total player hours and player matches and training sessions attended. Finally, this study used a cross-sectional epidemiological study design which may subject the observations to nonresponse bias and recall bias (Wang and Cheng, 2020).

Despite these mentioned limitations, information from this study may be benefitted from to guide future investigations and to highlight focussed injury prevention measures among soccer players.

CONCLUSION

Most soccer injuries in male U19 and U22 elite soccer players were lower limb injuries, newly sustained and required up to 14 days

of treatment before returning to full participation in competition. Match-play injuries appeared to be more common than training injuries, with the ankle and knee joints being the most common injury locations. Sprains and ligamentous damage were the most common injury class sustained by players. Finally, specifically of interest to the current study, ACL injury was found to be a dominant injury among knee injuries in elite soccer. Further interrogations on soccer injuries in Malaysia are vitally important in understanding the demands and focus areas in developing injury prevention measures in Malaysian soccer.

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Conflicts of interest

There are no conflicts of interest.

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APPENDIX A

Player's code No. ¹	Playing position ²	Age ³ , years	Stature, cm	Body mass, kg	Dominant leg ⁴ (L/R/B)	Details of previous major injuries	Study specific variable	Study specific variable

Notes: ¹ Use additional sheets if required ² Goalkeeper, Defender, Midfielder, Forward ³ Age as at the start of season / year / tournament ⁴ Left, Right, Bilateral © ICD 2009


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APPENDIX B

 <p>FIFA F-MARC FOR THE SPIRIT OF THE GAME</p>	<h3 style="text-align: center;">Injury Report Form</h3> <p>(Team) Player-code: _____ Date: _____</p>	<h3 style="text-align: center;">LOGO</h3>																																				
<p>1A Date of injury: _____ 1B Date of return to full participation: _____</p> <p>2A Injured body part</p> <table border="0"> <tr> <td><input type="checkbox"/> head / face</td> <td><input type="checkbox"/> shoulder / clavicle</td> <td><input type="checkbox"/> hip / groin</td> </tr> <tr> <td><input type="checkbox"/> neck / cervical spine</td> <td><input type="checkbox"/> upper arm</td> <td><input type="checkbox"/> thigh</td> </tr> <tr> <td><input type="checkbox"/> sternum / ribs / upper back</td> <td><input type="checkbox"/> elbow</td> <td><input type="checkbox"/> knee</td> </tr> <tr> <td><input type="checkbox"/> abdomen</td> <td><input type="checkbox"/> forearm</td> <td><input type="checkbox"/> lower leg / Achilles tendon</td> </tr> <tr> <td><input type="checkbox"/> low back / sacrum / pelvis</td> <td><input type="checkbox"/> wrist</td> <td><input type="checkbox"/> ankle</td> </tr> <tr> <td></td> <td><input type="checkbox"/> hand / finger / thumb</td> <td><input type="checkbox"/> foot / toe</td> </tr> </table> <p>2B Injured body part</p> <table border="0"> <tr> <td><input type="checkbox"/> right</td> <td><input type="checkbox"/> left</td> <td><input type="checkbox"/> not applicable</td> </tr> </table> <p>3 Type of injury</p> <table border="0"> <tr> <td><input type="checkbox"/> concussion with or without loss of consciousness</td> <td><input type="checkbox"/> lesion of meniscus or cartilage</td> <td><input type="checkbox"/> haematoma / contusion / bruise</td> </tr> <tr> <td><input type="checkbox"/> fracture</td> <td><input type="checkbox"/> muscle rupture / strain / tear / cramps</td> <td><input type="checkbox"/> abrasion</td> </tr> <tr> <td><input type="checkbox"/> other bone injury</td> <td><input type="checkbox"/> tendon injury / rupture / tendinitis / bursitis</td> <td><input type="checkbox"/> laceration</td> </tr> <tr> <td><input type="checkbox"/> dislocation / subluxation</td> <td></td> <td><input type="checkbox"/> nerve injury</td> </tr> <tr> <td><input type="checkbox"/> sprain / ligament injury</td> <td></td> <td><input type="checkbox"/> dental injury</td> </tr> </table> <p><input type="checkbox"/> other injury (please specify): _____</p> <p>4 Diagnosis (text or Orchard code): _____</p> <p>5 Has the player had a previous injury of the same type at the same site (i.e. this injury is a recurrence)?</p> <p><input type="checkbox"/> no <input type="checkbox"/> yes</p> <p>If YES, specify date of player's return to full participation from the previous injury: _____</p> <p>6 Was the injury caused by overuse or trauma?</p> <p><input type="checkbox"/> overuse <input type="checkbox"/> trauma</p> <p>7 When did the injury occur?</p> <p><input type="checkbox"/> training <input type="checkbox"/> match</p> <p>8 Was the injury caused by contact or collision?</p> <p><input type="checkbox"/> no <input type="checkbox"/> yes, with another player</p> <p><input type="checkbox"/> yes, with the ball</p> <p><input type="checkbox"/> yes, with other object (specify) _____</p> <p>9 Did the referee indicate that the action leading to the injury was a violation of the Laws?</p> <p><input type="checkbox"/> no <input type="checkbox"/> yes, free kick / penalty <input type="checkbox"/> yes, yellow card <input type="checkbox"/> yes, red card</p> <p>If YES, was the referee's sanction against: <input type="checkbox"/> injured player <input type="checkbox"/> opponent</p>			<input type="checkbox"/> head / face	<input type="checkbox"/> shoulder / clavicle	<input type="checkbox"/> hip / groin	<input type="checkbox"/> neck / cervical spine	<input type="checkbox"/> upper arm	<input type="checkbox"/> thigh	<input type="checkbox"/> sternum / ribs / upper back	<input type="checkbox"/> elbow	<input type="checkbox"/> knee	<input type="checkbox"/> abdomen	<input type="checkbox"/> forearm	<input type="checkbox"/> lower leg / Achilles tendon	<input type="checkbox"/> low back / sacrum / pelvis	<input type="checkbox"/> wrist	<input type="checkbox"/> ankle		<input type="checkbox"/> hand / finger / thumb	<input type="checkbox"/> foot / toe	<input type="checkbox"/> right	<input type="checkbox"/> left	<input type="checkbox"/> not applicable	<input type="checkbox"/> concussion with or without loss of consciousness	<input type="checkbox"/> lesion of meniscus or cartilage	<input type="checkbox"/> haematoma / contusion / bruise	<input type="checkbox"/> fracture	<input type="checkbox"/> muscle rupture / strain / tear / cramps	<input type="checkbox"/> abrasion	<input type="checkbox"/> other bone injury	<input type="checkbox"/> tendon injury / rupture / tendinitis / bursitis	<input type="checkbox"/> laceration	<input type="checkbox"/> dislocation / subluxation		<input type="checkbox"/> nerve injury	<input type="checkbox"/> sprain / ligament injury		<input type="checkbox"/> dental injury
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APPENDIX D

 <p>FIFA F-MARC FOOTBALL MANAGEMENT RESEARCH CENTRE For the Good of the Game</p>	<p>Exposure Report Form (for the documentation of team exposures)</p> <p>(Team) Player-code: _____</p>				<p>LOGO</p>
	<p>Date</p>	<p>Match / Training</p>	<p>No. of players (fully participating in training)</p>	<p>Duration of training session (minutes)</p>	<p>Study specific variable</p>

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