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Sports Injuries in the Australian Regular Army

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Abstract: Sports participation in the military is important for physical fitness and building morale and camaraderie. However, injuries caused by sports are detrimental to military capability. The purpose of this study was to investigate patterns of injury from sports participation in Australian Regular Army personnel. Injury data spanning a two-year period were obtained from the Department of Defence Workplace Health, Safety, Compensation, and Reporting (WHSCAR) database. Data were extracted for the top five sporting activities causing injuries. The most common body sites, natures, and mechanisms of injuries across these five sports were then determined. Sports participation accounted for 11% (n = 1092) of reported injuries (n = 9828). Soccer presented with the greatest number of injuries (23.3%), followed by rugby union/league (22.9%), touch football (18.6%), Australian rules football (12.0%), and basketball/netball (11.9%). The ankle, knee, and shoulder were the most injured body sites (21.9%; 17.2%; 11.6% respectively) across these five sports, with soft tissue injury, dislocation, and fractures being the most common natures of injury (55.1%; 12.7%; 11.9% respectively). The most common mechanisms of injuries were contact with objects (35.1%) and falls (27.4%). The current injury rates, locations, and mechanisms are similar to historical rates suggesting little impact by injury mitigation strategies.

Keywords: military; defence; sport participation; soccer; training

1. Introduction

Sporting participation is encouraged in defence force personnel as it is thought to have numerous benefits, including building fitness, strength, endurance, agility, teamwork, stress reduction, and "esprit de corps" [1]. The famous quote, attributed to the Duke of Wellington that "the battle of Waterloo was won on the playing fields of Eton" provides a historical military appreciation of these attributes and their potential military application [2] and was reported to have been used in the suggestion that Australia needed units similar to the sportsmen's battalions of Britain during the Great War [3]. This quote was also later touted following the cricket "Victory Test" played between Australia and Britain, which typified the sporting spirit that led these countries to defeat Germany and Japan in World War II [3].

Optimizing the benefits associated with sport and fitness while controlling risk of injury is of great importance for a defence population and presents a notable challenge [4]. Injuries in defence forces undermine capability and interfere with active duty service [5]. To reduce injuries and their downstream impacts, research in the military has typically focussed on injuries related to general military and physical training [6,7]. This targeted research has enabled successful intervention strategies to be implemented to reduce injury risk during these training activities [6,8–10]. However, not all injuries occur from military or physical training, and sports have been found to be a notable cause of injury in defence populations [1,11,12], to the point of impacting on operational duties [13]. Sporting injuries,

along with injuries associated with physical training, have been reported to have the greatest cost with respect to military force readiness, lost duty time, and the monetary expenditure for treatment, rehabilitation, and compensation [1] and have been found to occur more frequently than combat-related injuries, during combat operations [4,14,15]. The Australian Defence Force Health Status Report [1], for example, found that sport (47%) and physical training (24%) accounted for approximately 70% of all working days lost in the Australian Defence Force from July 1997 to June 1998.

This finding of high rates of sports injuries in defence personnel is not surprising given that sport is a common cause of injuries in the civilian population and the high prevalence of such injuries is well documented in the scientific literature [16]. Risk factors contributing to such injuries can be broadly categorized as intrinsic (e.g., age, sex, overuse, lack of flexibility, muscle weakness, etc.) or extrinsic (e.g., training errors, environmental conditions, inadequate nutrition, equipment, and illegal play) in nature [17,18]. It is at these risk factors that most risk minimization plans are specifically targeted (e.g., specific programs targeting deficits in range of motion or muscle imbalances, or prophylactic taping and bracing) [19].

With previous research [6,9,10,20] supporting the use of targeted interventions for risk minimization, effective and informed injury prevention strategies for sports could provide a good return on investment for military forces, with respect to readiness and productivity as well as decreased financial burden [1]. However, in order to address the injury rates associated with sporting participation in defence forces through implementation of effective injury prevention programs, commanders require a detailed sporting injury profile that identifies sites, natures, and causes of injuries [14]. The aim of this study was to identify the major sports leading to injury in the Australian Regular Army and to investigate body sites, injury types, and mechanisms associated with these injuries, to inform future risk reduction strategies.

2. Materials and Methods

Retrospective work health and safety incident and injury data were sourced from the Workplace Health, Safety, Compensation, and Reporting (WHSCAR) database of the Australian Department of Defence, which constitutes the source of records of incidents and injuries sustained by army personnel. The WHSCAR database is designed to capture all incident reports submitted in the notification and reporting of Workplace Health and Safety incidents occurring within the Department of Defence [21]. In reality, it has been estimated to capture only 11%–19% of all injury incidents that require health care [22], though it is likely to capture a much higher proportion of serious injuries, which result in longer-term disability or compensation, since reporting of such incidents is an essential step in demonstrating eligibility for compensation. The WHSCAR database nevertheless provides a useful overview of the "patterns" of injuries experienced by Australian Defence Force personnel, particularly given it is the only available source of such data, but caution should be applied in interpretation of the "rates" of injuries calculated from this database [22]. A qualified WHSCAR database operator extracted the data from the database in order to ensure optimal data retrieval and redacted all personal information to ensure that the data was non-identifiable. The WHSCAR data provided to the researchers spanned the period 01 July 2012 to 30 June 2014 and included military service (i.e., army) and the service type (part-time or full-time) to which the affected person belonged, type of occurrence, date of incident, incident severity, nature of resulting injury, body site affected by resulting injury, mechanism of resulting injury, activity at the time of the incident (including specific event, i.e., actual sport being played), incident description, and duty status at the time of the incident.

Work health and safety incident and injury records extracted from the WHSCAR database were included in the analysis if they related to: (a) full-time service; (b) a minor or serious personnel injury that occurred while the person was "on duty"; (c) an injury that occurred during sports participation in an Australian Defence Force-recognized sport [23]; and (d) an injury that occurred between 1 July 2012 and 30 June 2014, inclusive. Data from part-time personnel were removed, as previous published research in this population [24] found a 71% lower incidence of sporting injuries in part-time versus

full-time personnel; given the low rate of injuries and the noted differences between part-time and full-time personnel [24], inclusion of part-time personnel had the potential to introduce multiple confounding factors. The intent of including only "on duty" injuries was to allow comparison to previous research in this area. It should be noted that personnel authorized to play a given army-approved sport would be classified as "on duty" even if the injury occurred outside traditional working hours. The definitions of injury, be it a minor personal injury (MPI) or serious personal injury (SPI), were those derived, and defined, by the Australian Department of Defence [21], whereby an MPI is generally defined as a minor injury that did not result in a fatality, SPI, or a dangerous occurrence; and an SPI is generally defined as an injury requiring immediate treatment as an in-patient in hospital or for other series injuries (e.g., to the head, eye, amputation, etc). Records were excluded if they: (a) related to personnel from a foreign defence service, on secondment; or (b) contained missing or incomplete data.

The Australian Defence Human Research Ethics Committee (ADHREC, LERP14-024) and the Bond University Human Research Ethics Committee (BUHREC, RO-1907) granted ethics approval for this study. Departmental authorization for the project was obtained in parallel to the process for obtaining ADHREC approval.

Data Analysis

The WHSCAR data were provided in a Microsoft Excel spread sheet and were manually cleaned to ensure that only the records consistent with the inclusion and exclusion criteria were retained. In addition, each line of data was reviewed and compared to other lines of data to ensure identification and removal of duplicate entries (i.e., same record entered twice). Each data record was further verified, corrected, or made more precise by manually comparing the allocated "Type of Occurrence Classification System" (TOOCS) classifications with the free-text narrative data from the same record. When discrepancies were identified, precedence was given to the free-text narratives and the TOOCS classification was adjusted accordingly. Narratives provided by incident reporters are considered more detailed and accurate than data entered by a third party using a finite coding system [25]. The resulting, often more precise, TOOCS codes were employed in the subsequent data analysis. To increase data accuracy, brevity, and sensitivity, the TOOCS fields for "nature of injury" were aggregated, whereby "soft tissue injuries due to trauma or unknown mechanism" included "trauma to muscle" (a soft tissue) and "trauma to tendons" (a soft tissue) and for brevity was re-termed as "soft tissue injuries due to trauma". In addition, "trauma to joints and ligaments, not elsewhere classified" and "trauma to joints and ligaments unspecified" were merged into "trauma to joints and ligaments".

Descriptive analyses were employed to identify the most common sports in which injuries occurred. Subsequent analyses then focussed on the top five sports in which injuries occurred, and the most prevalent anatomical locations, natures, and mechanism of these injuries were then determined.

3. Results

A total of 9828 injuries were reported amongst Australian Regular Army personnel over the data collection period. In total, MPI accounted for 93.21% (n = 9161) of these injuries, with the remaining 6.79% (n = 667) of reported injuries being classified as SPI. Sports participation was the third highest cause of reported injuries in army personnel (n = 1092, 11.11%), only preceded by physical training (n = 3230, 32.87%) and combat training (n = 1747, 17.80%). When the sports data were reviewed specifically, no duplicates or incomplete datasets were found. However, 15 cells contained data in the TOOCS code that differed from those in the free-text narratives and the TOOCS classification was adjusted accordingly. For example, although initially entered as a "foot" injury, the free-text descriptor in one case specifically detailed a lateral ankle sprain. As such, the TOOCS classification was changed to "ankle".

The highest numbers of injuries were observed in soccer, with 254 reported MPI and SPI (Table 1), slightly higher than in "rugby union or league" (n = 250, 22.89%) and touch-football (n = 203, 18.59%).

Other sports associated with a high number of injuries included Australian rules football (n = 131, 12.00%) and basketball or netball (n = 130, 11.90%). A higher number of SPIs were reported in rugby union or league than in any other sport (n = 22, 27.50%).

Table 1. Australian Regular Army reported injuries associated with sport participation.

Sport	MPI n (%)		SPI n (%)		MPI and SPI n (%)	
Soccer	238	(23.52)	16	(20.00)	254	(23.26)
Rugby union/league	228	(22.53)	22	(27.50)	250	(22.89)
Touch football	189	(18.68)	14	(17.50)	203	(18.59)
Australian rules	120	(11.86)	11	(13.75)	131	(12.00)
Basketball/netball	125	(12.35)	5	(6.25)	130	(11.90)
Total of top 5	900	(88.93)	68	(85.00)	968	(88.65)
Total of all injuries	1012	(100.00)	80	(100.00)	1092	(100.00)

MPI = minor personal injury (an injury that did not result in a fatality or SPI); SPI = serious personal injury (an injury requiring immediate treatment as an in-patient in hospital or for other series injuries).

The ankle was the most commonly injured body site in these five sports, accounting for 21.90% of all reported injuries (n = 212), and was followed by the knee (n = 166 injuries, 17.15%) and the shoulder (n = 112, 11.57%) (Table 2). The knee and head recorded the highest numbers of SPI (n = 13 SPIs each, 19.12%) in these sports, followed by the shoulder (n = 11, 16.18%). The majority of SPIs at the knee were due to dislocation (30.77%), meniscal injuries (23.08%), or ligamentous injuries (23.08%). The majority of SPIs to the head were due to concussion (46.16%). Within soccer, the ankle (76 MPIs and 1 SPI), knee (37 MPIs and 5 SPIs), and upper leg (17 MPIs) were the most common sites of injury, while the most common sites of injury in rugby union league were the shoulder (49 MPIs and 5 SPIs), the knee (32 MPIs and 5 SPIs), and the ankle (30 MPIs and 2 SPIs). The ankle (40 MPIs and 3 SPIs), knee (34 MPIs and 2 SPIs), and shoulder (18 MPIs and 2 SPIs) were also the most commonly injured in touch football.

Table 2. Reported location of injuries amongst Australian Regular Army personnel in the top five injuring sports.

Location	MPI n (%)		SPI n (%)		MPI and SPI n (%)	
Ankle	205	(22.78)	7	(10.29)	212	(21.90)
Knee	153	(17.00)	13	(19.12)	166	(17.15)
Shoulder	101	(11.22)	11	(16.18)	112	(11.57)
Hand	73	(8.11)	3	(4.41)	76	(7.85)
Head	50	(5.56)	13	(19.12)	63	(6.51)
Thigh	49	(5.44)	0	(0.00)	49	(5.06)
Foot	39	(4.33)	3	(4.41)	42	(4.34)
Back	38	(4.22)	1	(1.47)	39	(4.03)
Wrist	26	(2.89)	3	(4.41)	29	(3.00)
Lower limb	22	(2.44)	2	(2.94)	24	(2.48)
Upper torso	18	(2.00)	2	(2.94)	20	(2.07)
Gastroc-soleus complex	16	(1.78)	1	(1.47)	17	(1.76)
Multiple	15	(1.67)	2	(2.94)	17	(1.76)
Upper limb	14	(1.56)	3	(4.41)	17	(1.76)
Abdomen	15	(1.67)	0	(0.00)	15	(1.55)
Lower limb multiple	14	(1.56)	1	(1.47)	15	(1.55)
Neck	15	(1.67)	0	(0.00)	15	(1.55)
Organs	10	(1.11)	1	(1.47)	11	(1.14)
Shins	9	(1.00)	0	(0.00)	9	(0.93)
Hip	7	(0.78)	1	(1.47)	8	(0.83)
Elbow	5	(0.56)	0	(0.00)	5	(0.52)
Neck and shoulder	4	(0.44)	0	(0.00)	4	(0.41)
Pelvis	1	(0.11)	1	(1.47)	2	(0.21)
Systemic	1	(0.11)	0	(0.00)	1	(0.10)
Total	900	(100)	68	(100)	968	(100)

MPI = minor personal injury (an injury that did not result in a fatality or SPI); SPI = serious personal injury (an injury requiring immediate treatment as an in-patient in hospital or for other series injuries).

The most common nature of injury in these five sports was soft tissue injuries due to trauma, accounting for 55.06% of all injuries (n = 533) and 11 SPIs (Table 3). Dislocations (n = 123, 12.71%) and other fractures (n = 115, 11.88%) were reported frequently, with both accounting for high numbers of SPIs (n = 13 and n = 25, respectively). Dislocations were predominately at the shoulder (n = 47, 38.21%) and knee (n = 37, 30.08%). Other fractures were the most commonly reported SPI (n = 25, 36.76%). The main site of fracture was at the hand, inclusive of fingers (n = 29, 25.21% of all fractures in these five sports). These patterns of incidence for nature of injury were reflected across three leading sports. For soccer, soft tissue injuries (123 MPIs and 1 SPI), fractures (16 MPIs and 6 SPIs), and dislocations (12 MPIs and 3 SPIs) were the most common. In both rugby league/union and touch football, soft tissue injuries (75 MPIs and 2 SPIs and 96 MPIs and 2 SPIs, respectively) were the most common, followed by dislocations (40 MPIs, 5 SPIs and 23 MPIs, 4 SPIs, respectively) and fractures (32 MPIs, 7 SPIs and 20 MPIs, 5 SPIs, respectively).

Table 3. The top five reported natures of injury in sports played by Australian Regular Army personnel.

Nature of Injury	MPI n (%)		SPI n (%)		MPI and SPI n (%)	
Soft tissue injuries due to trauma or unknown mechanisms	522	(58.00)	11	(16.18)	533	(55.06)
Dislocation	110	(12.22)	13	(19.12)	123	(12.71)
Other fractures	90	(10.00)	25	(36.76)	115	(11.88)
Trauma to joints and ligaments	60	(6.67)	4	(5.88)	64	(6.61)
Other intracranial injury	22	(2.44)	8	(11.76)	30	(3.10)
Total of top 5 injuring sports	804	(89.33)	61	(89.70)	865	(89.36)
Total of all sports injuries	900	(100)	68	(100)	968	(100)

MPI = minor personal injury (an injury that did not result in a fatality or SPI); SPI = serious personal injury (an injury requiring immediate treatment as an in-patient in hospital or for other series injuries).

The most common mechanisms for injuries amongst army personnel in these five sports are detailed in Table 4. Contact with moving or stationary objects was the most prevalent mechanism, accounting for the highest number of both MPI (n = 300) and SPI (n = 40). This mechanism, along with falls (n = 250, 27.78%) and muscular stress with no objects being handled (n = 246, 27.33%), comprised 88.33% of all injuries in these five sports. In soccer, muscular stress (81 MPIs and 1 SPI), contact with a moving or stationary object (67 MPIs and 8 SPIs), and falls (66 MPIs and 5 SPIs) were the most common mechanisms of injury. In rugby league/union contact with a moving or stationary object (104 MPIs and 16 SPIs), muscular stress (42 MPIs and 1 SPI), and falls (38 MPIs and 1 SPI) and in touch football with falls (71 MPIs and 3 SPIs), muscular stress (57 MPIs), and contact with moving or stationary objects (40 MPIs and 8 SPIs).

Table 4. The reported mechanism of sporting-related injuries in Australian Regular Army personnel.

Mechanism of Injury	MPI n (%)		SPI n (%)		MPI and SPI n (%)	
Contact with moving or stationary object	300	(33.33)	40	(58.82)	340	(35.12)
Falls	250	(27.78)	15	(22.06)	265	(27.38)
Muscular stress with no objects being handled	246	(27.33)	4	(5.88)	250	(25.83)
Being hit by a person accidentally	65	(7.22)	5	(7.35)	70	(7.23)
Muscular stress while lifting carrying or putting	13	(1.44)	0	(0.00)	13	(1.34)
Total of top 5 injuring sports	874	(97.11)	64	(94.11)	938	(96.90)
Total of all mechanisms	900	(100)	68	(100)	968	(100)

MPI = minor personal injury (an injury that did not result in a fatality or SPI); SPI = serious personal injury (an injury requiring immediate treatment as an in-patient in hospital or for other series injuries).

4. Discussion

This study aimed to investigate sporting injuries amongst Australian Regular Army personnel, specifically highlighting the site, nature, and mechanism most commonly associated with injury in sports. In this study of the Australian Regular Army, sports were the third most common activity to cause injury and accounted for 11% of all injuries in the army. Playing sport was also the second most common cause of SPI, associated with 80 SPIs over a two-year period. This finding is similar to findings from the previous Australian Defence Force (ADF) Health Status Report [1] in which 13.9% of ADF injuries could be attributed to sport.

In the top five sports associated with causing injury in this study, the ankle was the most commonly injured body site, featuring a high number of minor injuries but fewer serious injuries than the knee, which was the second most commonly injured body site. Injuries at or below the knee are traditionally the most commonly reported site of injury in military populations [6,7,26], with both the ankle and knee featuring heavily in the ADF health status report in 2000 [1]. In a review of civilian sports from the Australian population and in line with this research, the ankle was the leading site of injury followed by the knee in soccer (21% and 16.3%, respectively) [27]. The ankle and knee were also a leading site of injury in basketball (16% and 11%, respectively) and netball (40% and 18%, respectively) [27]. In Australian rules football the knee and the ankle were the second and third most commonly injured sites (knee 12% and 8% respectively) with the thigh being the leading site (20%) [27]. Similarly, the ankle was the leading site of injury in touch football (23%) concurring with the results of this study, followed by the leg (16%) and the knee (15%) [27]. Given that these aforementioned sports were leading sports found to cause injury in this army population, the findings of high ankle and knee injury rates was not unexpected. Considering this, understanding the risk factors associated with injuries to these body sites in the civilian community could help guide future risk management strategies in military personnel.

Despite some proportion of the risk of injury being attributable to poor conditioning [19], the leading risk factor for ankle injuries is a history of ankle injury [28]. Ligaments particularly have a reduced tensile strength (50%–70% that of uninjured tissue) [29] and decreased mechanoreceptor function following injury, leading to poor joint position sense post injury [30]. Likewise, previous knee injuries have been associated with subsequent knee injuries amongst military personnel [31]. Participation in sport is itself a risk factor for knee injury [32], along with poor quadriceps function, which is a common sequela post knee injury [33]. High-impact activity both from combat training and drills and carrying heavy loads may also increase stress on the knee joint in this population [34]. On this basis, the reconditioning program for the injured site needs to consider the overall training load that the soldier is subject to [35], noting that some of these loads will come from the soldier's general military training and work requirements [36].

Soft tissue injuries were by far the most common nature of sporting injuries in this study, accounting for more than half of the reported injuries. Soft tissue injuries around the ankle were most commonly sprains, while soft tissues at the knee primarily consist of damage to the meniscus and ligaments [37]. Dislocations and fractures, which were the second and third most common nature of sporting injuries in this study, account for almost a quarter of all sporting injuries. Dislocations at the shoulder, especially, may have a more significant impact despite being less in number than soft tissue injuries, as previous research has demonstrated that over a quarter of shoulder dislocations lead to be chronic or recurrent injuries [38]. Furthermore, given the high rate of associated issues such as Bankart or Hills Sachs lesions with traumatic shoulder dislocations, many require surgical intervention and subsequently a long recovery period [39]. The ADF Health Status Report [1] stated that sprains and strains were the most prevalent type of injury at that time, accounting for almost 30% of all reported injuries, a figure notably lower than the 50% observed in this current study. The reasons for these differences in prevalence are not known.

"Contact with objects" was the leading mechanism of sporting injuries in this study. With approximately 50% of soccer based injuries (the leading sport associated with injury in this study

and the second most common mechanism of injury) due to player-to-player contact [40], this mechanism of injury being a leading mechanism is not surprising. It should be noted that it has been suggested that up to 35% of soccer contact injuries can be attributed to unfair play potentiating player-to-player contact [41]. The combined mechanisms of injury-causing falls and muscular stress accounted for over 50% of the sporting injuries in this study. Falls have previously been linked to 33% of all touch football injuries (the leading mechanism of touch football injuries in this study), 19% of soccer injuries, and 11% of rugby union/league injuries (the third most common mechanism of injury in those sports in this study) [1]. Ground surfaces have been found to be responsible for many falls associated with sporting injuries, while muscular stress is often due to both training errors and over training [1]. The finding in this study is supported by research in a U.S. defence population, which found that overly aggressive play and poorly maintained surfaces were the leading contributors to sports and recreation based injuries [42]. On this basis, ensuring that injury reporting processes include a description of the playing surface may be of value. This information could be used to identify surfaces that may increase injury risk and subsequently guide the appropriate choice of surface to play sports at different geographical locations.

High-risk sports identified in this study included soccer, rugby (rugby union or rugby league), touch football, Australian rules football, and basketball or netball. These sports were responsible for 88.64% of reported sporting injuries and are therefore where preventative measures should be primarily focussed. These same sports feature heavily in the ADF Health Status Report [1], which recommended that qualified supervision, world class techniques, and education of commanders and personnel on risk minimization strategies, be put in place. Highlighted in the report, 30%–50% of sports injuries were claimed to be preventable, varying across different sports. It is thought that over half of the injuries associated with sport are due to human error, 31% are due to environment, and 15% due to equipment [1]. Furthermore, the report postulated that up to 20% of injuries could be prevented by education and 17% by modifying the environment [1].

Following on from the ADF Health Status Report [1], a report by Sherrard et al. [19] made specific recommendations to reduce injuries in the ADF. These recommendations notably focussed on soccer, rugby, and touch football (the three sports with the highest number of associated sporting injuries) as well as the ankle, knee, and shoulder (the three bodily sites with the highest number of associated sporting injuries). Recommendations ranged from approaches to mitigate injuries due to foul play, through to improved refereeing, and awareness-raising programs to encourage a culture of fair play and safe participation, and the use of prophylactic taping and bracing and addressing imbalances and flexibility deficits to minimize overuse injuries [19]. In addition, there has been a plethora of investigations of sporting injuries in the civilian sporting context that focus either on the sports themselves (e.g., soccer injuries [17,40,43]) or on the sites of injuries (e.g., ankle [44,45]) providing further insight and guidance for targeted intervention strategies.

Despite these recommendations, and while many intervention programs have had success in preventing combat training [9] and physical training [6,10,20] injuries, it appears that reducing injuries suffered by personnel playing sports is still a challenge. Given that a range of recommendations exist, in both military and civilian sporting contexts, future research should focus on investigating whether these recommendations are appropriate to this unique population and whether these recommendations are, or can be, effectively employed in the military sporting population.

Limitations

The leading sports identified to be causing injuries in this study are clearly influenced by cultural factors specific to the country in which this study was undertaken (being the Australia Army). The high incidence of injuries in Australian rules football, a sport rarely played in other countries, serves as an example. In the United Sates Army, more injuries are seen in basketball, American football, and softball [11], while in the British Army, soccer injuries are more prevalent [13]. As such, cultural differences may need to be considered before implementing or adopting sports injury prevention

strategies in or from other defence forces. Apart from potential underreporting of minor injuries [22], it is acknowledged that sporting injuries may have occurred during other activities (for example an injury that may have occurred during a game of touch football that was played at the end of a physical training session may be recorded as a physical training injury rather than as a sporting injury), and as such, the actual number of injuries is anticipated to be a very conservative reflection. Finally, the data did not contain information regarding the gender of the person injured, the numbers of players, or levels of exposure (i.e., cumulative number of hours played) for the individual sports. One potential means of improving the quality of this data may be through the employment of point-of-care reporting systems [22] (as opposed to the current self-reporting).

5. Conclusions

Sports participation is still a leading cause of injuries in army personnel with soccer and rugby being the leading sports associated with these injuries. The ankle, knee, and shoulder are the joints most injured through soft tissue trauma, dislocation, and fracture. It is hoped that the results of this study will inform and guide future injury prevention and management strategies not only for the Australian Army, but also for other military services, which suffer from a high number of sporting related injuries. It is proposed that by ensuring ground surfaces are adequate for sport, good refereeing practices are introduced and enforced to minimize foul play, and ensuring that injuries are rehabilitated properly, it might be possible to reduce injuries in the sports highlighted in this study.

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