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Accuracy of self-reported injuries compared to medical record data

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ABSTRACT

Background: Self-reported injury data are frequently used in epidemiologic investigations. These data provide useful information about the activities and mechanisms of injuries because injury cause-coding is often not required for outpatient medical visits.

Objectives: The purpose of this evaluation is to determine the accuracy of self-reported military injuries when compared to injuries in outpatient medical records.

Method: Injuries reported by survey were compared to diagnoses for injuries (International Classification of Diseases (ICD-9-CM 800–999)) and injury-related musculoskeletal disorders (selected ICD-9-CM 710–739) obtained from medical records. Self-reported injury responses from military personnel were matched to diagnoses by date and body part. A new methodology for including secondary matching body parts was proposed and implemented.

Results: Infantry Soldiers (n = 5490) completed surveys that requested details about their most recent injury. About one-quarter (24%, n = 1336) reported injuries on the survey and had an injury diagnosis in their medical record in a six month period. Seventy-five percent of the self-reported injuries (n = 996 of 1336) were confirmed by medical records with a date match within 3 months and an identical or nearby body part. Common self-reported injuries were ankle sprains (10%), knee sprains (9%), lower back strains (4%), shoulder strains (3%), and lower back pain (3%).

Conclusions: A high percentage of self-reported injuries were accurate when compared with medical records, substantiating the use of survey data for the evaluation of injury outcomes. This is the first effort to validate self-reported injuries and musculoskeletal disorders with medical records in a large military population.

1. Introduction

Unintentional injuries are a leading health problem for the military (Jones et al., 2010b). Injury diagnoses and Soldier demographics are routinely captured in military medical databases when medical care is sought. Though injury cause-coding is not required in outpatient medical records (Canham-Chervak et al., 2016; Ruscio et al., 2010), self-reported injury details can be captured through surveys. This additional information, such as the activities, mechanisms, and lost work time associated with injuries, can provide valuable details to military leadership and safety professionals to inform the development of injury prevention programs and strategic initiatives (Gunlicks et al., 2010).

Since self-reported injury data are frequently used in epidemiologic studies of military populations (Grier et al., 2017; Hauret et al., 2015; Jones et al., 2010a; Knapik et al., 2004), it is essential to understand the accuracy of these data. Soldiers' self-reported information is generally accurate, for information like physical fitness test scores (Jones et al., 2007; Knapik et al., 1992) and body mass index (Martin et al., 2016). Unfortunately, the accuracy of self-reported injury data has not been previously established in large military populations. In other populations, comparisons between injury databases have been conducted (Bjørneboe et al., 2011; Braun et al., 1994; Gabbe et al., 2003; Kucera et al., 2011; Valuri et al., 2005), but with differing methods and inconsistent findings. This prompted the need for an investigation into the accuracy of self-reported injury data when compared to medical records in a large military population.

2. Methods

A survey was administered to Soldiers in two U.S. Army infantry Brigade Combat Teams, one in October–November 2010 and the other in September 2011, when overseas deployments were common. The responses considered in this analysis were from initial retrospective surveys used for baseline data collection as part of a larger project investigating physical training programs and injury risk. These projects were reviewed and approved by the Army Public Health Center Public

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Table 1
Criteria used to determine body part matches between self-reported injuries and medical diagnosis codes.

Medical record body part diagnosis category[a]	Survey body part response categories Primary Match[a]	Survey body part response categories Secondary Match[a]
Head, face, eye, ear, nose, TBI	Head/face	Neck
Neck, cervical spine, esophagus	Neck	Head/face, upper back
Shoulder, upper arm	Shoulder, arm	Upper back
Arm	Arm, elbow, shoulder	Wrist
Elbow, forearm, humerus, radius	Elbow	Arm
Wrist	Wrist	Arm, hands/fingers
Hand, fingers	Hand/fingers	Wrist
Chest, ribs	Chest	Upper back
Upper back, thoracic spine	Upper back	Shoulder, chest, neck, lower back
Abdomen	Abdomen	Pelvis, lower back
Lower back, lumbar spine, sacrum, coccyx	Lower back	Abdomen, upper back, pelvis, hip
Hip	Hip	Lower back, pelvis, upper leg
Pelvis, trunk	Pelvis	Hip, abdomen, lower back, upper leg
Upper leg, thigh	Upper leg	Pelvis, hip, knee
Knee	Knee	Upper leg, lower leg
Lower leg	Lower leg	Knee, ankle
Ankle	Ankle	Lower leg, foot
Foot, toes	Foot	Ankle
Unspecified	ANY	
Multiple parts	ANY	

[a] Where possible, diagnosis codes and survey responses were placed into body part categories adapted from established injury classification tools (Barell et al., 2002; Hauret et al., 2010a).

Health Review Board as public health practice. Injury risks for these populations have been reported elsewhere (Anderson et al., 2017; U.S. Army Public Health Center, 2014; Grier et al., 2017).

The 85-question paper survey collected information about injuries occurring in the past 12 months. Injury was defined as any accidental or intentional force applied to the body that caused harm. The following injury types were given as examples: joint sprain, muscle or tendon strain, concussion, cut finger, broken bone, and shin splint. Examples of injury circumstances were also provided: falling from a ladder, an automobile crash, being hit by a bullet fired from a weapon, excessive exercise or running long distances, repetitive lifting/pulling/pushing of objects, or repeatedly pitching a softball. To limit the length of the survey, additional details about only the most recent injury were obtained. For their most recent injury, respondents were asked to report the following details: the injury date, injured body part, injury type, whether the injury was accidental or intentional, the activity during which the injury occurred, the mechanism of injury, whether or not medical attention was sought, and how many days of limited duty resulted. Survey responses were imported to electronic format using Remark Office Software®.

When asked for the date of injury, respondents provided the approximate month and year when the injury occurred. Responses to the question regarding the injured body region were grouped into the following categorical options, consistent with those suggested in injury coding classification literature (Barell et al., 2002; Hauret et al., 2010a): head/face, neck, shoulder, arm, elbow, wrist, hand/fingers, chest, upper back, abdomen, lower back, hip, pelvis, upper leg, knee, lower leg, ankle, foot, and “other.” Injury types that respondents could choose were: sprain; strain; dislocation; broken/fractured bone; bruise; scrape/abrasion; cut/laceration/puncture; loss of body part (amputation); tendonitis or bursitis; nerve injury; concussion; blister; burn; pain; heat or cold injury (heat exhaustion, heat stroke, frostbite, hypothermia); other (further specification requested). Respondents were also asked to report the mechanism of their injury (e.g., overexertion, fall/jump/trip/slip, struck against or struck by an object or person), and the activity associated with their injury (e.g., running, sports, lifting or moving heavy objects).

For the same surveyed battalions, electronic medical records for all Soldiers on the rosters were obtained from the Defense Medical Surveillance System with medical encounter visit dates extending back six months. Injury diagnoses were identified using a comprehensive index of International Classification of Diseases, 9th Revision, clinical modification (ICD-9-CM) medical diagnoses codes (Knapik et al., 2004). The index includes the Injury and Poisoning code group (ICD-9-CM 800–999) and diagnoses for selected injury-related musculoskeletal disorders in other ICD-9-CM code groups (337–355, 692, and 710–739) (World Health Organization, 2009). Codes for poisonings, toxins, and complications related to medical procedures were not included, consistent with recommendations for military injury surveillance (Department of Defense Military Injury Metrics Working Group, 2002) and prior military field investigations.

This data analysis was conducted using the Statistical Package for the Social Sciences (SPSS®), version 19.0. Consistent with prior injury data validations (Bjørneboe et al., 2011; Braun et al., 1994; Gabbe et al., 2003; Valuri et al., 2005), date of injury and body part were considered during the matching process. A self-reported injury was considered to be a date match with a medical visit if the self-reported injury date was within three months of the medical visit (before or after). Previous validation studies that matched encounters by date did not adequately describe their criteria for matching, but a six month time-frame (± three months of encounter date) was chosen for this analysis because respondents' memory of injury dates may not be exact and the onset of many chronic overuse injuries may be difficult to identify precisely (Zwerling et al., 1995).

Following date match, the self-reported injured body part was compared to the matching electronic medical encounter. It was considered a ‘primary body part match’ if the injured body area reported on the survey was identical to the body part associated with the ICD-9-CM diagnosis code, as presented in injury classification matrices for traumatic injuries (Barell et al., 2002) and injury-related musculoskeletal disorders (Hauret et al., 2010a). Self-reported injuries to a body part in close proximity to the body part associated with the diagnosis code were also considered to be potential injury matches (or ‘secondary body part matches’), as previous attempts to validate injuries have noted that survey respondents may not accurately report body parts due to poor memory or misunderstanding of the injury (Valuri et al., 2005). All body parts that were considered matches (primary and secondary) are shown in Table 1. For Soldiers with multiple injury diagnoses listed in their medical record, all of the injury diagnoses were compared to the survey response as a possible match. If there were multiple medical encounters and both primary and secondary matches were present, the self-reported injury was considered a primary match and the most recent medical encounter date was used to calculate recall.

Once matching injury diagnoses and survey reports were identified, descriptive statistics were calculated for the leading ICD-9-CM diagnoses associated with the matched self-reported injuries. For the five self-reported injuries most frequently matched with medical diagnoses, the most commonly associated diagnoses and the recall periods between injury occurrence and survey report are presented. This analysis was conducted for those diagnoses with date matches within three months and only a primary body part match, as well as for those with date matches and either a primary or secondary body part match. “Other” responses for injury type or body part were counted as matches if they were within the appropriate date range, but are not included as part of the top five self-reported injuries. Self-reported injuries that affected multiple body parts were also considered a match to the medical record if one of the reported body parts was a primary or secondary match to the injured body part in the electronic medical record and was within the appropriate date range. These “other” or “multiple” injuries, however, are not included with the most frequently reported injury types. Those reporting an injury on the survey that did not match a diagnosis in the medical records were also analyzed, to ensure that the body part matches listed in Table 1 did not require revision.

3. Results

Of the 10,984 Soldiers in the two surveyed brigades, 91% were men, 91% were enlisted ranks, and the average age was 31 ± 6 years. The most common military occupational specialties were Infantry (18%), Repair and Maintenance (13%), and Armor (12%). Within the six months prior to survey administration, 4620 (42%) of these Soldiers had a total of 22,600 medical encounters for injuries. A total of 5492 (50%) Soldiers were available and completed the survey. The demographics of the surveyed population were similar to those of the overall population (92% men, 91% enlisted, mean age 31 ± 6).

Table 2 displays the agreement between self-reported and medical record injury data. Forty-two percent of survey respondents (n = 2330) reported having at least one injury in the past twelve months, and 19% of them (n = 438) reported having more than one injury. Most respondents with injuries in both databases (1,336) said that the injury occurred within the same time frame as the collected medical records (previous 6 months, May–October 2010 or March–August 2011). Among those, 996 (75%) matched to medical record data by date and primary or secondary body region. Five percent of the study population (n = 285) had data that could not be assessed for matches because the self-reported injury date was outside of the requested date range for medical records.

Similarly, 73% (n = 2299) of those with no self-reported injuries (n = 3160) also did not have an injury diagnosis. While these 2299 Soldiers with no injuries in either database (42% of the study population) represent strong agreement between the two databases as well, the remaining analysis and discussion focuses on those 1336 respondents that both reported an injury and had an injury diagnosis in their medical record.

3.1. Primary matching injuries

Seven hundred nineteen self-reported injuries matched medical records by both date and primary body region (estimated injury date within three months of diagnosis date and an exact body part match with the medical visit record). The top-five most frequently reported injuries were ankle sprain/strains (12%), lower back sprain/strains (6%), knee sprain/strains (4%), shoulder sprain/strains (4%), and lower back pain (4%) (Table 3). Among these injuries, 96% reported an associated activity and 94% reported an injury mechanism with a majority of injuries (83%) resulting in limited duty days for an average of 64 days. About two-thirds of the matched injuries (66%) occurred within one month of the survey date.

3.2. Primary and secondary matching injuries

Table 4 displays a similar summary of the five leading self-reported injuries with either a primary or secondary matching body part according to Table 1 and a matching date within three months (n = 996). The commonly verified self-reported injuries were similar to those

Table 2
Self-reported injuries and Injury Diagnoses among Survey Respondents.

	Injury diagnosis in Medical Record (previous 6 months)	Injury diagnosis not in Medical Record (previous 6 months)	Total
Self Report = YES	**1336** *Reported injury and medical record injury* **996** *Reported injury and medical record match for date and primary or secondary body part* **340** *Did not match by date (±3 months) and/or body part*	**711** *Reported injury is in date range of medical records, but no injury diagnosis in medical record*	**2047** *Respondents with reported injuries in same time frame as medical records*
Self Report = YES but **beyond date range of requested medical records**	–	–	**285** *Respondents with reported injuries that are not in the same date range as medical records*
Self Report = NO	**861** *There is an injury diagnosis in the medical record, but respondent did not report the injury on the paper survey*	**2299** *There is no reported injury or injury diagnosis in the medical record*	**3160** *Respondents with no reported injuries*
Total	**2374** *Respondents with at least one injury diagnosis in medical record*	**3118** *Respondents with no injury diagnoses in medical record*	**5492** *Total survey respondents*

Table 3
Leading Self-Reported Injuries with Primary Matching[a] Medical Diagnoses (n = 719 injured Soldiers).

Top 5 matched injuries by body part/injury type survey responses[b]	Number of Soldiers with matched injury n (%)	Top diagnoses from electronic medical record n (%)	Recall periods (months between medical encounter and survey administration)[bc]n (%)
Ankle sprain/strain	87 (12)	845.00 Sprain of ankle 42 (48) 719.47 Joint pain, ankle 28 (32) 729.50 Pain in limb 5 (6)	≤1: 36 (41) 2: 16 (18) 3-6: 10 (11)
Lower back sprain/strain	41 (6)	724.20 Lumbago 24 (59) 847.20 Sprain lumbar region 4 (10) 724.50 Backache 3 (7)	≤1: 20 (49) 2: 7 (17) 3-6: 11 (27)
Knee sprain/strain	32 (4)	844.90 Sprain or strain, knee 8 (25) 726.64 Patellar tendinitis 6 (19)	≤1: 10 (32) 2: 7 (22) 3-6: 12 (39)
Shoulder sprain/strain	31 (4)	719.41 Joint pain, shoulder 15 (48) 840.40 Rotator cuff sprain 4 (13) 840.80 Sprain of shoulder 4 (13)	≤1: 11 (35) 2: 8 (26) 3-6: 9 (29)
Lower back pain	30 (4)	724.20 Lumbago 23 (77) 724.50 Backache 2 (7)	≤1: 14 (47) 2: 10 (33) 3-6: 4 (13)

[a] Primary body part match, date match ± 3 months.
[b] Self-reported survey response for most recent reported injury only.
[c] 60 responses (8%) did not have a recorded survey date, so recall periods could not be calculated for all reported injuries.

observed for primary matches: ankle sprain/strains (10%), lower back sprain/strains (4%), shoulder sprain/strains (3%), and lower back pain (3%). More knee injuries were captured with this methodology (9%), as many self-reported sprain/strains cases were diagnosed as lower leg joint pain (ICD-9-CM 719.46) and were therefore not considered a primary injured body part match. Limited duty days were reported as associated with 83% of the injuries, with an average of 58 days of limited duty per injury. Almost half of the matched injuries (45%) occurred within one month of the date the survey was taken.

3.3. Non-matching injuries

Of the 340 Soldiers who self-reported injuries that did not match the encounter in their electronic medical record, most (76%) reported seeking medical care for their injury. However, they were not matches because 1) 152 (45%) did not have a primary or secondary matching body part, 2) 130 (38%) had survey-reported injury dates that were more than three months before or after the medical encounter date, and 3) 58 (17%) did not match by date or body part.

Among the 711 respondents who self-reported an injury that was not in the medical record, the most common reported injuries were ankle sprain/strain (13%), knee sprain/strain (9%), and lower leg sprain/strain (5%). Fifty-three percent reported seeking medical attention and 38% said they were put on limited duty.

Eight hundred sixty-one survey respondents had an injury diagnosis in their medical record that was not self-reported by the respondent. Common diagnoses were lower leg joint pain (719.46, 12%), lumbago (724.20, 10%), and concussion (850.00, 5%). Most of these diagnoses (60%) occurred within three months prior to survey administration.

4. Discussion

4.1. Confirmation of self-reported injuries

Of the 1336 Soldiers with both injury survey responses and injury diagnoses in medical records, 54% were confirmed through primary matching dates and body parts. This is comparable to other similar injury validation studies for sports injuries (Gabbe et al., 2003) and work-related injuries (Jenkins et al., 2002). When secondary body parts were included, 75% of self-reported records were corroborated by a

Table 4
Leading Self-Reported Injuries with Matching[a] Medical Diagnoses (n = 996 injured Soldiers).

Top 5 matched injuries by body part/injury type survey responses[b]	Number of Soldiers with matched injury n (%)	Top 3 diagnoses from electronic medical record n (%)	Recall periods (months between medical encounter and survey administration)[bc]n (%)
Ankle sprain/strain	98 (10)	845.00 Sprain of ankle 42 (43) 719.47 Joint pain, ankle 28 (29) 719.46 Joint pain, lower leg 8 (8)	≤1: 43 (44) 2: 17 (17) 3-6: 32 (33)
Knee sprain/strain	89 (9)	719.46 Joint pain, lower leg 55 (62) 844.90 Sprain or strain, knee 8 (9) 726.64 Patellar tendinitis 6 (7)	≤1: 40 (45) 2: 12 (13) 3-6: 31 (35)
Lower back sprain/strain	44 (4)	724.20 Lumbago 24 (59) 847.20 Sprain lumbar region 4 (10) 724.50 Backache 3 (7)	≤1: 23 (52) 2: 7 (16) 3-6: 11 (25)
Shoulder sprain/strain	34 (3)	719.41 Joint pain, shoulder 15 (41) 840.40 Rotator cuff sprain 4 (12) 840.80 Sprain of shoulder 4 (12)	≤1: 12 (35) 2: 9 (26) 3-6: 10 (29)
Lower back pain	32 (3)	724.20 Lumbago 23 (72) 724.10 Pain in Thoracic Spine 2 (6) 724.50 Backache 2 (6)	≤1: 16 (50) 2: 10 (31) 3-6: 4 (13)

[a] Primary or secondary body part match, date match ± 3 months.
[b] Self-reported survey response for most recent reported injury only.
[c] 70 responses (7%) did not have a recorded survey date, so recall periods could not be calculated for all reported injuries.

match to a comparable date and exact or nearby body part in the medical encounter, which is similar to the validation rate of another injury study that matched surveys with medical records (Braun et al., 1994). While other aspects of self-reported data related to physical fitness have been validated for military survey respondents (Jones et al., 2007; Knapik et al., 1992; Martin et al., 2016; Wessely et al., 2003), this is the first known study to corroborate self-reported injuries with injury diagnoses from electronic medical records for a large military population. Other parallel studies have investigated the validity of self-reported lower back pain among Soldiers (Carragee and Cohen, 2009), and the validity of reported injuries among a unique military population of elite Special Operations Forces Soldiers (Lovalekar et al., 2017). Both of these investigations had lower recall rates than the 75% accuracy that was observed when all self-reported injuries were compared to medical record data in the current application to a large military population (n > 5000).

4.2. Secondary body part matches

When secondary body part matches were considered together with primary matches, 277 (38%) more survey-reported injuries were found to match medical records than when only primary (exact) body part matches were included. Limitations of using only primary body part matches have been noted in the past (Valuri et al., 2005), but this is the first known proposed alternative. Future validation studies should consider a similar process of secondary matching, to account for respondent misunderstanding of the exact injury location and/or non-specific coding by providers.

4.3. Recall of injuries

The survey collected information on respondents' most recent injury, and almost half (48%) of confirmed self-reported injuries in this study occurred within one month prior to survey administration. This is consistent with previous studies on recall bias for injury, which suggest that shorter recall periods provide more accurate responses due in part to less memory decay (Jenkins et al., 2002). A 12 month recall period for injury self-reports has often been used in the past (Gabbe et al., 2003; Twellaar et al., 1996; Van Mechelen et al., 1996; Zwerling et al., 1995), but it has been criticized as leading to underreporting due to recall bias (Jenkins et al., 2002; Landen and Hendricks, 1995; Warner et al., 2005). Some time frames which have been suggested for best recall are four weeks (Landen and Hendricks, 1995), five weeks (Warner et al., 2005), two months (Jenkins et al., 2002), and six months (Braun et al., 1994). While this survey used a less reliable recall period of 12 months, only those injuries from the past six months were compared to medical records. Therefore, underreporting resulting from recall bias in this investigation may have been partially minimized.

Especially when using longer recall periods, severity has been noted as a critical determining factor for patient recall, as respondents with more serious injuries are more likely to recall them (Braun et al., 1994; Landen and Hendricks, 1995). Since 83% of the confirmed self-reported injuries resulted in limited duty in the current population, severity likely affected recall. Shorter recall periods should be considered for future studies to improve injury recall and reduce underreporting.

Thirty-five percent (n = 711) of Soldiers who self-reported injuries in the same time frame as the medical records did not have an injury diagnosis in their medical record. Similarly, 177 Soldiers did self-report an injury but indicated that the injury date was outside the date range of the 6 months of obtained medical records, so the reported injury therefore was not eligible to be matched. In both of these situations (up to n = 888 injuries), reported injury types of sprains/strains and pain indicate that these injuries were predominantly cumulative overuse injuries. Therefore, it's possible that the Soldier had a cumulative injury for which they did seek medical attention, or they may have identified the injury as having onset much sooner than their medical visit date. In the latter case, this could lead to a discrepancy between a reported injury date and the actual medical visit date, and the injury would not be recognized as a match even though it was recorded in both databases. In this way, the matching rate for overuse injuries may be underrecognized (Zwerling et al., 1995).

4.4. Unmatched self-reported injuries: severity and recall

Recall bias issues likely influenced matching, as well. There were 340 Soldiers in the current population who self-reported an injury and also had a medical visit with an injury diagnosis, but the self-reported injury did not match the medical encounter data due to a date mismatch, body part mismatch, or both. For those cases with matched body parts but mismatched dates, it is possible that the respondent forgot when they had been injured, or onset occurred long before they were seen by a medical professional. When reported dates matched but the injured body part did not, one reason may have been that Soldiers presented with multiple injuries but only received a diagnosis code for one (in order to focus treatment, providers often prioritize the most serious injury). In those cases, the medical record and the respondent may have reported different injured body parts.

4.5. Strengths and limitations

This was the first effort to investigate the accuracy of a large population of self-reported military injury data, and it was observed that 75% of self-reported injuries among respondents that also had an injury diagnoses could be confirmed by details in the medical records. This large proportion provides confidence in the survey methodologies being implemented to collect data for epidemiologic studies and evaluations of risk factors for injury outcomes in Soldier populations.

There are some limitations to note. First, only 9% of this survey population was women. While this is approximately representative of the female Army population (Defense Medical Surveillance System), musculoskeletal disorders are typically more prevalent among women (Yang et al., 2012). Especially because combat occupations have recently been opened to women (Cone, 2016), future studies of military injuries should attempt to include data from as many women as possible to best investigate injury risks for the entire military population. Furthermore, injuries during deployments were not captured in either database, so the accuracy of self-reported information for those injuries was not assessed. As non-battle injuries are a significant issue in deployment settings (Hauret et al., 2010b), self-reported activity and cause information is useful for prevention planning in those situations as well.

The proposed process for secondary body part matching was successful in the current application, but it has the potential to introduce false matching. It is important that secondary matches be closely reviewed to ensure that reported injuries are indeed reasonably similar to medical records.

Medical records were only available for six months, but survey respondents were asked to report their injuries in the past 12 months. This led to additional complexity when interpreting results and future studies should attempt to compare accuracy of reports within the same time frames. Furthermore, this survey only asked survey respondents to report details about their most recent injury. Especially since over half of Soldiers with confirmed reported injuries (55%) said they had more than one injury, a broader set of self-reported injuries could be compared to medical records if future studies are able to capture details about multiple injuries.

The injury diagnoses for the 861 survey respondents who had a medical record for injury but did not report an injury on the paper survey were comparable to those that were matched to self-reports (sprains/strains, pain, etc.). It's possible that these respondents simply did not want to answer the detailed questions about their injuries and therefore purposely did not report them on the survey. While multiple survey questions are necessary to obtain the most robust data about injury activities and mechanisms, this answer avoidance may be reduced by administering web-based electronic surveys where respondents can't look ahead to know how many future questions potentially pertain to the present responses. Previous studies have shown that web-based surveys provide more complete data (Kongsved et al., 2007; Reitz and Anderson, 2013), and similar current injury surveys are being conducted with electronic software when feasible.

As discussed, a shorter time period for reporting past injuries will lead to better recall, especially for less severe injuries. Additional studies will need to be conducted to validate self-reported injury data from other military subpopulations, such as trainees, those in other military occupational specialties, and members of other military service branches.

5. Conclusions

This is the first validation study comparing self-reported military injuries to electronic medical records for a large military population. Three quarters (75%) of self-reported injuries among those with injury diagnoses were observed to match the details of the medical encounter, when a novel approach incorporating proximate body regions was applied. This high proportion supports continued use of surveys for collection of injury outcome data.

Conflicts of interest

The views expressed in this document are those of the authors and do not necessarily reflect the official policy of the Department of Defense, Department of Army, US Army Medical Department or the US Government.

The authors have no conflicts of interest to note.

Ethical approval

This work was approved by the Army Public Health Center Public Health Review Board as public health practice.

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