Injury Epidemiology of U.S. Army Special Operations Forces

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ABSTRACT Musculoskeletal injuries have long been a problem in general purpose forces, yet anecdotal evidence provided by medical, human performance, and training leadership suggests musculoskeletal injuries are also a readiness impediment to Special Operations Forces (SOF). The purpose of this study was to describe the injury epidemiology of SOF utilizing self-reported injury histories. Data were collected on 106 SOF (age: 31.7 ± 5.3 years, height: 179.0 ± 5.5 cm, mass: 85.9 ± 10.9 kg) for 1 year before the date of laboratory testing and filtered for total injuries and those with the potential to be preventable based on injury type, activity, and mechanism. The frequency of musculoskeletal injuries was 24.5 injuries per 100 subjects per year for total injuries and 18.9 injuries per 100 subjects per year for preventable injuries. The incidence of musculoskeletal injuries was 20.8 injured subjects per 100 subjects per year for total injuries and 16.0 injured subjects per 100 subjects per year for preventable injuries. Preventable musculoskeletal injuries comprised 76.9% of total injuries. Physical training (PT) was the most reported activity for total/preventable injuries (PT Command Organized: 46.2%/60.0%, PT Noncommand Organized: 7.7%/10.0%, PT Unknown: 3.8%/5.0%). Musculoskeletal injuries impede optimal physical readiness/tactical training in the SOF community. The data suggest a significant proportion of injuries are classified as preventable and may be mitigated with human performance programs.

INTRODUCTION

Despite significant study of injury epidemiology in U.S. military personnel,[1–5] limited published data have described injury patterns of U.S. Special Operations Forces (SOF).[6–9] Anecdotal evidence provided by medical, human performance, and training leadership suggests musculoskeletal injuries continue to be a readiness impediment to SOF, including U.S. Army Special Operations Command (USASOC). The advanced tactical and physical requirements of USASOC personnel, and fiscal implications, including direct medical costs and manpower, of training USASOC personnel, highlight the importance of mitigating those musculoskeletal injuries with the potential to be preventable. Thus, it is critical to assess the extent of musculoskeletal injuries in this specialized community by describing injury epidemiology.

Musculoskeletal injuries in SOF have been previously identified in various SOF cohorts, and these injuries have a negative impact on force readiness.[6–9] Naval Special Warfare (NSW) personnel sustained 0.9 to 3.2 injuries per 100 personnel per month (approximately 11 to 38 injuries per 100 personnel per year).[8] Of these injuries, 21% of the diagnoses required surgery and had associated loss of time because of surgery and rehabilitation.[8] Similarly, of 87 Marine Corps Special Operations personnel surveyed, 28 sustained at least one injury during a predeployment training cycle of approximately 12 months, resulting in 41 total injuries (approximately 47 injuries per 100 personnel per year).[7] Of those injured, over 80% reported that their ability to train was hindered as a result of their injury. Although a similar statistic on injury frequency and severity is not available in USASOC Operators, based on all diagnoses encountered by U.S. Army 5th Special Force Group in the Armed Forces Health Longitudinal Technology Application (AHLTA) database, after "administrative" categories were excluded, roughly 40% of all diagnoses were related to musculoskeletal injuries.[6] Those musculoskeletal injuries commonly involve back/neck, knee, shoulder, and ankle. Given the significance of musculoskeletal injuries sustained in SOF, further research is warranted to investigate injury frequency and severity in USASOC personnel in order to facilitate development of appropriate injury prevention training programs.

Consistent with the public health approach to injury prevention and control,[10] the University of Pittsburgh human performance and injury prevention research with USASOC was initiated to support development of USASOC's Tactical Human Optimization, Rapid Rehabilitation, and Reconditioning program. The first phase of the initiative is to collect injury data from the target population to understand the magnitude, nature, and impact of the injury problem.[2] Injury data, such as types of injuries, locations, and activities/mechanisms of injuries when injury occurred, would play an essential tool for clinicians and operators to understand injury epidemiology in their community. Further, because of limitations of automated database (AHLTA) and categories of injury diagnoses using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM), intricate information such as activities and mechanisms of injuries when injuries occurred have not been well examined in USASOC community. Therefore, the purpose of this analysis was to

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describe the injury epidemiology of the 3rd SOF Group utilizing self-reported injury histories. Clinically, injury epidemiology could assist subsequent research phases in the model[2] and ultimately identify the priorities necessary for refinement of USASOC's physical training (PT) program to reduce musculoskeletal injuries and enhance force readiness.

METHODS

Human subject protections approvals were obtained by the appropriate necessary civilian and military review boards. Musculoskeletal injury data were captured from individual participant self-reports for a period of the prior 12 months and were obtained as a part of a comprehensive laboratory test protocol. Musculoskeletal injury data were one component of a comprehensive human performance research data collection consisting of biomechanical, musculoskeletal strength and flexibility, balance, physiological, and nutrition variables.[2]

Self-reported musculoskeletal injury data were collected on 106 male USASOC Special Forces Soldiers (age: 31.7 ± 5.3 years, height: 179.0 ± 5.5 cm, mass: 85.9 ± 10.9 kg, years of experience: 11.0 ± 5.5 years), from 3rd Special Forces Group (3SFG). Subjects were included in the University of Pittsburgh human performance and injury prevention research with USASOC if they were aged 18 to 60 years (inclusive); had no recent (3 month) history of traumatic brain injury, other neurological, or balance disorder; had no recent (3 month) history of upper/lower extremity or back musculoskeletal injury; had no history of metabolic, cardiovascular, or pulmonary disorder; and, were cleared for full and unrestricted duty. All subjects included in this analyses were enrolled as part of our larger research study with USASOC. Since assessment in the overall study requires laboratory testing that involves maximal physical exertion it was necessary that all subjects be free of musculoskeletal injuries in the 3 months prior to ensure prior musculoskeletal injury did not have any residual impact on the laboratory testing procedures. The total duration of injury query was based on 12 months before the laboratory data collection (3 months injury free buffer and 9 additional months).

Injury data were entered using a customized online application into a database, the University of Pittsburgh Military Epidemiology Database (UPitt-MED), by clinically trained research associates to ensure an accurate and thorough injury history. The UPitt-MED questionnaires included questions about injury anatomic location, anatomic sublocation, injury type, activity during which injury occurred, cause of injury, mode of onset of injury, mechanism of injury, and treatment received.

For the purposes of this analysis, an unintentional musculoskeletal injury was defined as an injury to the musculoskeletal system (bones, ligaments, muscles, tendons, etc.) that, if occurring after enlistment, resulted in alteration in tactical activities, tactical training, or PT for a minimum of 1 day, regardless if medical attention was sought. If the injury occurred before enlistment, then the injury resulted in alteration in activities of daily living and/or training/athletic activities for greater than 1 day, regardless if medical attention was sought. This includes conditions such as sprains, strains, and fractures (broken bones), but not contusions or lacerations (bruises and cuts).

Injuries were then further classified as preventable or not preventable. "Preventable injuries" are those musculoskeletal injuries that can be reduced through injury prevention programs that are developed to improve neuromuscular and physiological characteristics related to risk of musculoskeletal injury. Examples of preventable musculoskeletal injuries include lower extremity stress fractures resulting from running and/or marching and noncontact knee ligament injuries. "Not preventable injuries" are musculoskeletal injuries not able to be deterred through these injury prevention programs and includes injuries such as those sustained during motor vehicle accidents, direct contact, or stepping in a ditch. Other not preventable injuries include certain fractures, such as those to the face, fingers, or toes. The operational definitions of preventable and not preventable musculoskeletal injuries in this study are specific to our research group whose aim is to develop PT programs that improve modifiable neuromuscular and physiological characteristics related to risk of musculoskeletal injury. Although some of the injuries classified in this study as not preventable may be prevented through other intervention strategies, such as sleep modification, these injuries would not be preventable through PT programs.

Statistical Analysis

Self-reported injury data during a period of 1 year before the date of laboratory testing have been included in the injury description. Injuries were described using relative frequency (percent). The frequency of injuries was calculated as the number of injuries per 100 subjects per year. Injury incidence was calculated as the number of injured subjects per 100 subjects per year.

RESULTS

Self-reported injuries within a 1-year period before data collection have been described. The 106 subjects included in the analysis reported 26 injuries, including 20 preventable injuries, during a 1-year period.

Eighty-four subjects (84/106, 79.2%) did not report any injury during a 1-year period. Eighteen subjects (18/106, 17.0%) reported one injury, and four subjects (4/106, 3.8%) reported two injuries during a 1-year period. Eighty-nine subjects (89/106, 84.0%) did not report any preventable injury during a 1-year period. Fourteen subjects (14/106, 13.2%) reported one preventable injury, and three subjects (3/106, 2.8%) reported two preventable injuries during a 1-year period.

The frequency of injury for 3SFG subjects was 24.5 injuries per 100 subjects per year and injury incidence was 20.8 injured subjects per 100 subjects per year. The frequency of preventable

injury for 3SFG subjects was 18.9 injuries per 100 subjects per year and the injury incidence for preventable injuries was 16.0 injured subjects per 100 subjects per year. Preventable musculoskeletal injuries comprised 76.9% of injuries that occurred during the year before laboratory testing, for this 3SFG sample.

The anatomic location and sublocation of injuries are described in Figure 1 and Table I. The lower extremity was the most common location for injuries (13/26, 50.0%) and for preventable injuries (12/20, 60.0%). The shoulder and knee were common sublocations for injuries (each 6/26, 23.1%) and preventable injuries (each 5/20, 25.0%).

Data regarding the cause of injuries are described in Table II. Running and lifting were common injury causes. Running was the cause of 23.1% of injuries and lifting was the cause of 19.2% of injuries. When only preventable injuries were included in the analysis, running was the cause of 30.0% of preventable injuries and lifting was the cause of 25.0% of preventable injuries.

Data about activity when injury occurred are described in Table III and Figure 2. PT was the most reported activity for total injuries (PT Command Organized: 46.2%, PT Non Command Organized: 7.7%, PT Unknown: 3.8%) and preventable injuries (PT Command Organized: 60.0%, PT Non Command Organized: 10.0%, PT Unknown: 5.0%).

Injury types are described in Table IV. Common injury types for total injuries were sprain (6/26, 23.1%), fracture and strain (each 3/26, 11.5%). When only preventable injuries were analyzed, common injury types were sprain (6/20, 30.0%) and strain (3/20, 15.0%).

Musculoskeletal injuries were classified according to their onset as acute (18/26, 69.2% of injuries), overuse (7/26, 26.9%), and unknown onset (1/26, 3.8%). Among preventable injuries, 13 injuries (13/20, 65.0%) were acute and seven injuries (7/20, 35.0%) were overuse. Musculoskeletal injuries were classified according to their mechanism as contact injuries (10/26, 38.5% of injuries), noncontact injuries (15/26, 57.7%), and unknown mechanism (1/26, 3.8%). Among preventable injuries, five injuries (5/20, 25.0%) were contact injuries, 14 injuries (14/20, 70.0%) were noncontact injuries, and one injury (1/20, 5.0%) had an unknown mechanism.

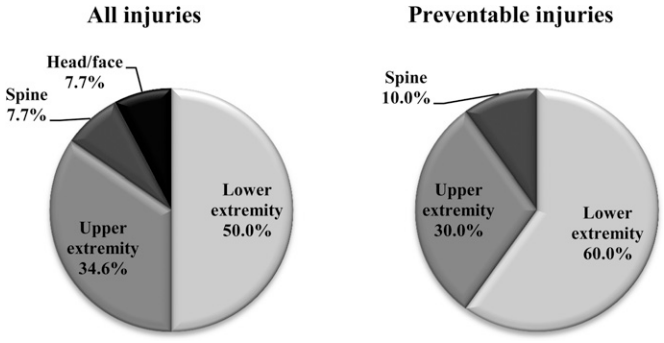

FIGURE 1. Anatomic location of injuries during a 1-year period.

TABLE I. Anatomic Sublocation of the Injuries During a 1-Year Period

Injury Anatomic Location	Anatomic Sublocation	All Injuries *N* (%)	Preventable Injuries *N* (%)
Lower Extremity	Knee	6 (23.1%)	5 (25.0%)
	Ankle	3 (11.5%)	3 (15.0%)
	Thigh	1 (3.8%)	1 (5.0%)
	Lower Leg	2 (7.7%)	2 (10.0%)
	Foot and Toes	1 (3.8%)	1 (5.0%)
Upper Extremity	Shoulder	6 (23.1%)	5 (25.0%)
	Upper Arm	1 (3.8%)	1 (5.0%)
	Hand and Fingers	2 (7.7%)	0 (0.0%)
Spine	Lumbopelvic	2 (7.7%)	2 (10.0%)
Head/Face	Eye	1 (3.8%)	0 (0.0%)
	Other	1 (3.8%)	0 (0.0%)
Total		26	20

TABLE II. Cause of Injuries During a 1-Year Period

Cause of Injury	All Injuries *N* (%)	Preventable Injuries *N* (%)
Running	6 (23.1%)	6 (30.0%)
Lifting	5 (19.2%)	5 (25.0%)
Cutting	3 (11.5%)	3 (15.0%)
Direct Trauma	3 (11.5%)	0 (0.0%)
Landing	2 (7.7%)	2 (10.0%)
Crushing	1 (3.8%)	0 (0.0%)
Fall—Same Level	1 (3.8%)	0 (0.0%)
Marching	1 (3.8%)	1 (5.0%)
Other	1 (3.8%)	1 (5.0%)
Unknown	3 (11.5%)	2 (10.0%)
Total	26	20

TABLE III. Activity When Injury Occurred During a 1-Year Period

Activity	All Injuries *N* (%)	Preventable Injuries *N* (%)
Combat	1 (3.8%)	0 (0.0%)
Motor Vehicle Accident	1 (3.8%)	0 (0.0%)
PT[a]—Command Organized	12 (46.2%)	12 (60.0%)
PT[a]—Non Command Organized	2 (7.7%)	2 (10.0%)
PT[a]—Unknown	1 (3.8%)	1 (5.0%)
Recreational Activity/Sports	3 (11.5%)	2 (10.0%)
Tactical Training	4 (15.4%)	3 (15.0%)
Other	2 (7.7%)	0 (0.0%)
Total	26	20

[a]Denotes further classifications of PT as activity when injury occurred.

Musculoskeletal injury data were classified according to type of treatment sought following injury. Eleven injuries (11/26, 42.3%) required some type of diagnostic testing (magnetic resonance imaging, X-Ray or computed tomography scan). Ten injuries (10/26, 38.5%) required rehabilitation, 6 injuries (6/26, 23.1%) were prescribed pain medication, and 15 injuries (15/26, 57.7%) resulted in a prescription of rest. When preventable injuries were analyzed separately, six preventable injuries (6/20, 30.0%) required diagnostic testing. Ten preventable injuries (10/20, 50.0%) required rehabilitation,

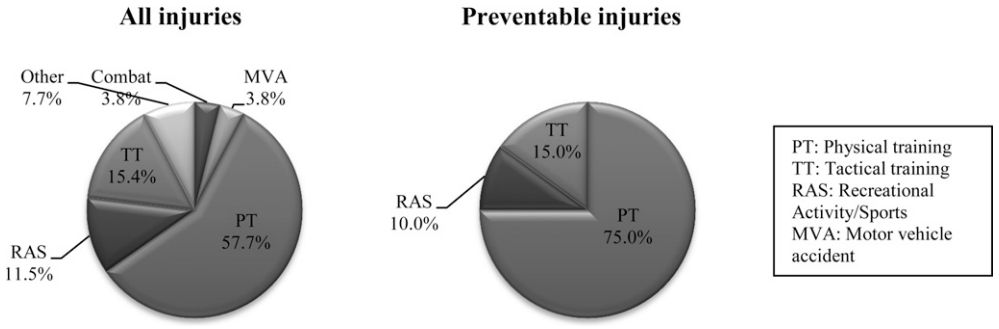

FIGURE 2. Activity when injury occurred during a 1-year period.

TABLE IV. Injury Type During a 1-Year Period

Injury Type	All Injuries *N* (%)	Preventable Injuries *N* (%)
Sprain	6 (23.1%)	6 (30.0%)
Fracture	3 (11.5%)	1 (5.0%)
Strain	3 (11.5%)	3 (15.0%)
Bursitis	2 (7.7%)	2 (10.0%)
Meniscal	2 (7.7%)	2 (10.0%)
Pain/Spasm/Ache	2 (7.7%)	2 (10.0%)
Concussion	1 (3.8%)	0 (0.0%)
Dislocation	1 (3.8%)	0 (0.0%)
Impingement	1 (3.8%)	1 (5.0%)
Inflammation	1 (3.8%)	1 (5.0%)
Tendonitis/Tenosynovitis/ Tendinopathy	1 (3.8%)	1 (5.0%)
Other	2 (7.7%)	1 (5.0%)
Unknown	1 (3.8%)	0 (0.0%)
Total	26	20

four preventable injuries (4/20, 20.0%) were prescribed pain medication, and 13 preventable injuries (13/20, 65.0%) resulted in a prescription of rest.

DISCUSSION

The objective of this analysis was to describe the self-reported injury epidemiology of 3SFG Soldiers for 1 year before laboratory testing at the Warrior Human Performance Research Laboratory. As part of a human performance and injury prevention research project, this analysis initially identified the specific musculoskeletal injury patterns within the U.S. Army SOF community. When compared with other SOF community, injury frequency and incidence rates are comparable and much less than those in the SOF trainees. Overall, a majority of musculoskeletal injuries occurred during PT and tactical training: they are preventable in nature. It implies that potential prevention strategies should focus on modifying PT and tactical training, especially involving running, lifting, cutting, and landing movements.

Injury Frequency and Incidence

In this investigation, the frequency of all musculoskeletal injury and injury incidence was 24.5 injuries per 100 subjects per year and 20.8 injured subjects per 100 subjects per year, respectively. The injury frequency is comparable with the injury frequency sustained by NSW personnel (approximately 11 to 38 injuries per 100 subjects per year).[8] A study by Linenger et al[11] conducted among U.S. Navy Sea-Air-Land (SEAL) trainees described medical conditions and musculoskeletal injuries during the SEAL candidacy training: This study revealed 29.7 cases of musculoskeletal injuries per 100 trainee-months (approximately 300 injuries per 100 subjects per year), which is higher than the injury frequency in this study. A higher injury frequency (approximately 47 injuries per 100 subjects per year) was also reported by Hollingsworth[7] in Marine Corps Special Warfare personnel during a strenuous predeployment training cycle. There are potential explanations among studies: training phase, injury definition, and subject selection.

In both the Linenger et al[11] and Hollingsworth[7] studies, injuries were described during specific training cycles, and perhaps higher frequencies of injuries were noted in both cases because certain injuries are more common during particular training cycles or evolutions. However, in this study, there was individual variability among subjects in phase of physical and tactical training depending on their missions in upcoming deployments.

In addition, definitions of injury are different among studies. For example, in the study by Hollingsworth,[7] subjects were asked about pain or physical limitation because of musculoskeletal injury during the predeployment workup cycle. This definition is different from the definition used in our study, which defined an injury as a musculoskeletal injury that disrupted physical and/or training activities for at least 1 day whether or not medical attention was sought. The differences in injury frequency might be substantial as the majority of Marine Operators (19/28 Operators) with injuries continued their routine training regardless of injuries and reported no loss of training days. Injury frequency would likely be underestimated in this study.

This investigation is a part of comprehensive laboratory testing. Therefore, subjects must have met inclusion and exclusion criteria, which may have potentially excluded 3SFG Operators who suffered serious injuries from the study. Likely, those who suffer musculoskeletal injuries that are

severe enough might have been assigned to different units or services outside of the Special Forces community. That would likely mean that we tested some of the most resilient Operators who have been through many training, missions, and/or deployments without major injuries. Again, this would result in underestimation of actual injury counts.

Lauder et al[12] used data in a database for Army personnel in 1989–1994 to describe injuries related to sports and PT. Diagnoses were coded using the ICD-9-CM. The rate of sports injuries was 38 per 10,000 person-years for men. This incidence rate cannot be directly compared to the cumulative incidence calculated from this study, but both studies underscore the high risk of musculoskeletal injuries in the Army.

As a part of the University of Pittsburgh Injury Prevention and Performance Optimization research initiatives, we have conducted similar epidemiological analyses at two specific military populations: U.S. Army 101st Airborne Division (Air Assault) and NSW personnel.[2,9] These studies revealed a high incidence of musculoskeletal injuries among 101st Division Soldiers and NSW personnel. In addition to injury frequency and incidence of musculoskeletal injuries, this study separated preventable and nonpreventable injuries. Preventable musculoskeletal injuries comprise the majority of injuries. These results substantiate efforts to reduce injuries through well-designed PT and combat training.

Anatomic Location and Sublocation

Comparison of the anatomic location and sublocation for injuries in this study to those reported in other literature is presented in Table V. In this study, injuries occurred most frequently in the lower extremity in the 3SFG. These data were consistent with Hollingsworth[7] who reported that the lower extremity was the most injured region in Marine Corps Forces Special Operations personnel and with Peterson et al[8] who identified a similar proportion of lower extremity injuries in NSW personnel. In contrast, Lynch and Pallis[6] reported a lesser percent of injuries to the lower extremity in 5SFG. The primary anatomic sublocations of injury identified in this study were the knee and shoulder followed by the ankle. Hollingsworth[7] also identified the knee as the most commonly injured body region followed by the low back and ankle. Contrary to these findings, Peterson et al[8] and Lynch and Pallis[6] reported that neck/back pain was the most common musculoskeletal in NSW personnel and the 5SFG, respectively. Both of these studies also reported the other frequently injured sublocations of injury as the ankle, shoulder, and knee; however, these sublocations were not in the same order.

Musculoskeletal injuries in NSW personnel also were described by our group.[9] We described medical chart–reviewed as well as self-reported injuries. For medical chart–reviewed injuries, the anatomic location most frequently reported was the upper extremity followed by the lower extremity, spine, and torso. For self-reported injuries, anatomic location most frequently reported was the lower extremity followed by the upper extremity, spine, torso, and head/face. The most common anatomic sublocation for medical chart–reviewed injuries was the shoulder and for self-reported injuries was the ankle and shoulder (each 16.7%). The injury distributions revealed in this study of 3SFG more closely resemble the self-reported data collected in the NSW study, with the highest proportion of self-reported injuries occurring in the lower extremity in both cases.

The results of this study of 3SFG are variable in comparison with investigations of injury location in other Army populations. Our research group conducted a study describing self-reported injuries among Army Soldiers in the 101st Airborne Division.[2] Bilateral injuries were counted twice in this report. The majority of injuries (62.6%) affected the lower extremity, which agrees with this study findings among 3SFG, where the majority of injuries (50.0%) also affected the lower extremity. In the study by Lauder et al,[12] the most commonly injured body parts were the knee and the ankle, with anterior cruciate ligament injury most common injury type in men. Although the most common anatomic location is similar to that in this study, shoulder injuries were the most common injury in the current study. The 3SFG Operators participate in more tactical training involving the upper extremity such as marksmanship training, rope climbing/repelling, lifting/loading/unloading, close-quarter combat with or without weapons, and skydiving training. Intensity and frequency of those training are likely related to more shoulder injuries when compared to the general forces.[12]

Types of Injuries and Acute/Overuse

In this investigation, sprain was the most common injury type (23.1%), followed by fracture and strain (each 11.5%). In our study of NSW Operators, among medical chart–reviewed injuries, strains (25.7%), pain/spasm/ache (20.0%), and fracture (11.4%) were common injury types. Among self-reported injuries, fracture (26.4%), sprain (13.9%), and strain (12.5%) were common injury types. In both this study and our investigation of 101st Airborne Division (Air Assault) Soldiers,[2] sprain was the most common injury type (22.2% of injuries in the study among 101st Airborne Division (Air Assault) Soldiers, and 23.1% in this study). The results from these investigations reveal consistent injury types. It is also related to how injuries occur. As discussed in the next paragraph, acute injuries are more common than overuse injuries.

The majority of musculoskeletal injuries in this study were classified as acute (69.2%), which is in accordance with previous reports. Hollingsworth[7] reported a high proportion of traumatic injuries (54%) in a Marine Special Operations Company. Lauder et al[12] also demonstrated that for Army men and women combined, acute musculoskeletal injures accounted for 82% of all injuries, and that acute injuries made up a greater proportion of injuries as compared to

overuse injuries. In the study by Linenger et al[11] of Navy SEAL trainees, overuse injuries accounted for >90% of all injuries, but in this study, acute injuries were more common. The fact that study by Linenger et al[11] was conducted among trainees may explain the higher frequency of injuries as well as a greater proportion of overuse injuries, as compared to this study that was not among trainees. The lower extremity was the most common location for injuries in both studies. This is important to note that the 3SFG Operators have been likely managing their training volume and rest cycles to avoid overuse musculoskeletal injuries. Given their age and years of service, the Operators learn the deployment cycles and specific training within each cycle.

Activities and Mechanisms of Injuries When Injuries Occurred

Military injury epidemiology studies have demonstrated that PT is a common activity during which musculoskeletal injuries frequency occur. This investigation revealed that of the injuries classified as preventable, 75% injuries occurred during PT (command organized, noncommand organized, or unknown). In our investigation of injuries in NSW personnel, subjects reported participation in training for 40.0% of medical chart–reviewed injuries and 56.9% of self-reported injuries. Previous work by our group investigated mechanism of injury in a group of 101st Airborne Division (Air Assault) Solders.[2] Like this study of 3FGS, this study found that training (PT, tactical training, or unspecified training) was the most common activity during which injuries occurred (48.5% of injuries in the study among 101st Airborne Division (Air Assault) Soldiers). Likewise, running was the most common cause of injury in both studies (34.3% of injuries in the study among 101st Airborne Division (Air Assault) Soldiers, and 23.1% in this study).

Our findings conflict with previous work by Lauder et al,[12] who described only injuries related to sports and PT using ICD-9-CM codes in Army personnel. In the case that an external cause of injury was recorded, only 11% of the subjects had injuries related to sports or PT. In contrast, this study included only men and was based on self-reported injury data not restricted to hospitalizations, and a much higher proportion of injuries (84.6%) was related to any type of training (physical or tactical) or recreational activity/sports in this study. This could be because injuries caused by training or sports in this young, active population typically are less likely to require hospitalization, causing a lower proportion of training injuries in the study by Lauder et al as compared to this study.

Limitations and Other Considerations

This investigation has limitations. The variability of injury frequency, incidence, anatomical location, type, and mechanism among studies may be explained by the variance in injury data collection methods utilized. Self-reported data are prone to issues with the effect of recall. However, in our case, the self-reported method may have captured injuries that medical records may have missed because of perceived reduced severity, and lack of hospitalization or doctor visit. This investigation and the Hollingsworth study[7] utilized self-reported survey, whereas Lynch and Pallis[6] and Peterson et al[8] utilized diagnostic categories (ICD-9CM) and medical record database. Understanding the differences between medical chart reviews and self-reports, and limitations of each collection method should be recognized.

CONCLUSION

PT is critical to the prevention of musculoskeletal injuries and optimization of human performance in SOF, yet a significant number of injuries are sustained during such training activities. The majority of these injuries are preventable. Musculoskeletal injuries affecting the lower extremity, and the frequency and severity of these injuries may negatively impact force readiness. Implementation of injury prevention and human performance programming is critical to maintenance of the most important weapons system platform—the Operator. Specifically, based on this investigation, reducing acute sprain/strain injuries during running, lifting, cutting, and landing during the centralized PT and tactical training should be focused through proper technique and training intensity/duration.

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Editor *(Name and complete mailing address)*: WILLIAM H.J. HAFFNER M.D. 9320 OLD GEORGETOWN RD, BETHESDA, MD 20814

Managing Editor *(Name and complete mailing address)*:

10. Owner *(Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)*

Full Name	Complete Mailing Address
AMSUS	9320 OLD GEORGETOWN RD, BETHESDA, MD 20814

11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box → ☐ None

Full Name	Complete Mailing Address

12. Tax Status *(For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)*
The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes:
☑ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months *(Publisher must submit explanation of change with this statement)*

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13. Publication Title: MILITARY MEDICINE — 14. Issue Date for Circulation Data Below: SEPTEMBER 2014

15. Extent and Nature of Circulation			Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies *(Net press run)*			6853	6881
b. Paid Circulation *(By Mail and Outside the Mail)*	(1)	Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	6082	6089
	(2)	Mailed In-County Paid Subscriptions Stated on PS Form 3541 *(Include paid distribution above nominal rate, advertiser's proof copies, and exchange copies)*	0	0
	(3)	Paid Distribution Outside the Mails Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS®	212	270
	(4)	Paid Distribution by Other Classes of Mail Through the USPS (e.g., First-Class Mail®)	0	0
c. Total Paid Distribution *(Sum of 15b (1), (2), (3), and (4))*			6294	9359
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	(2)	Free or Nominal Rate In-County Copies Included on PS Form 3541	0	0
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e. Total Free or Nominal Rate Distribution *(Sum of 15d (1), (2), (3) and (4))*			419	426
f. Total Distribution *(Sum of 15c and 15e)*			6713	6785
g. Copies not Distributed *(See Instructions to Publishers #4 (page #3))*			140	96
h. Total *(Sum of 15f and g)*			6853	6881
i. Percent Paid *(15c divided by 15f times 100)*			94%	94%

* If you are claiming electronic copies, go to line 16 on page 3. If you are not claiming electronic copies, skip to line 17 on page 3.

PS Form **3526,** July 2014 *(Page 2 of 4)*

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☒ If the publication is a general publication, publication of this statement is required. Will be printed in the October 2014 issue of this publication. ☐ Publication not required.

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