



Descriptive Epidemiology of Musculoskeletal Injuries in Naval Special Warfare Personnel



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ABSTRACT

Injury prevention is of utmost importance in the Naval Special Warfare (NSW) population. The first step in the Public Health Model as applied to injury prevention is measuring the burden of injuries in the population of interest. Previous studies examining musculoskeletal injuries in NSW personnel have utilized either medical chart review (MCR) or self-report (SR), but not both. MCRs yield only those injuries for which medical care was sought. SR injuries are prone to issues with lack of recall, especially as time since injury increases. Using both methods provides further detail of the injury burden. **PURPOSE:** To describe both MCR and SR musculoskeletal injuries in the NSW population. **METHODS:** Two hundred thirty five NSW personnel volunteered (age 28.3 ± 5.8 years, height 1.8 ± 0.1 meters, weight 85.7 ± 9.4 kilograms). MCR and SR injuries were obtained by certified athletic trainers, and musculoskeletal injuries sustained during the calendar year prior to the year of survey were described. Injury description included anatomic location, activity when injury occurred, and injury type. **RESULTS:** MCR were reviewed for 108 subjects and SR were obtained for 226 subjects. For both MCR and SR data, the average numbers of injuries recorded during one year were 0.32 per subject. Anatomic distribution for MCR injuries was - upper extremity (UE): 45.7%, lower extremity (LE): 34.3%, spine: 17.1% and torso: 2.9%. Anatomic distribution for SR injuries was - LE: 47.2%, UE: 37.5%, spine: 8.3%, torso: 4.2% and head/face: 2.8%. The most common anatomic sub-location was the shoulder (28.6%) for MCR injuries, and the ankle and shoulder (16.7% each) for SR injuries. Subjects were engaged in training for 40.0% of MCR and 56.9% of SR injuries. Subjects were engaged in recreational activity/ sports for 8.6% of MCR and 20.8% of SR injuries. Common MCR injury types were strains (25.7%), pain/spasm/ache (20.0%), and fracture (11.4%). Common SR injury types were fracture (26.4%), sprain (13.9%), and strain (12.5%). **CONCLUSION:** The analysis shows that musculoskeletal injuries are common in the NSW population. Many of these injuries are potentially preventable by an injury prevention and performance optimization program.

EXPERIMENTAL DESIGN AND METHODS

STUDY DESIGN

- Descriptive epidemiology study

SUBJECTS

- Two hundred thirty-five subjects volunteered; Medical charts were available and reviewed for 108 subjects, and injury self-reports were obtained from 226 subjects
- Age = 28.3 ± 5.8 years, height = 1.8 ± 0.1 meters, weight = 85.7 ± 9.4 kilogram

METHODS

- Detailed data about musculoskeletal injuries and related musculoskeletal conditions (henceforth referred to as injury) were obtained from two sources:
 - Medical chart review: Injury data were extracted by certified athletic trainers. Medical chart reviews were performed during 2009 – 2010
 - Self-reported injury history: Study subjects were interviewed about history of injuries by certified athletic trainers at the University of Pittsburgh Warrior Human Performance Research Laboratory. Self-reports were obtained during 2008 - 2010
- Injury data were entered into a customized relational database
- Injury description included anatomic location, activity when injury occurred, and injury type

STATISTICAL ANALYSIS

- Musculoskeletal injuries sustained during one calendar year were described
- Injuries per subject were described using relative frequency (percent)
- Description of injuries included calculation of injury percent in each category



RESULTS

- **Injury frequency:** Frequency of medical chart reviewed as well as self-reported injuries was 0.32 per subject per year
- **Anatomic location of injuries:**

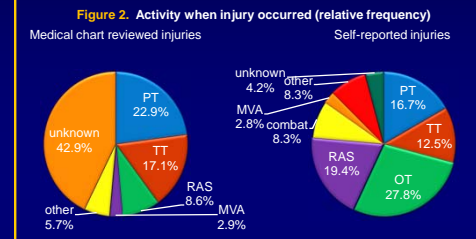
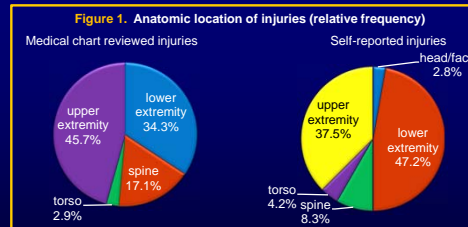
- Most injuries affected the extremities (Figure 1)
- Common anatomic sub-location:

Medical chart reviewed injuries

Shoulder (28.6% of injuries)
Thigh (11.4%)
Ankle (11.4%)
Lumbopelvic spine (11.4%)

Self-reported injuries

Shoulder (16.7% of injuries)
Ankle (16.7%)
Lower leg (12.5%)
Hand and Fingers (8.3%)



Common injury types:

Medical chart reviewed injuries

Strain (25.7% of injuries)
Pain/spasm/ache (20.0%)
Fracture (11.4%)

Self-reported injuries

Fracture (26.4% of injuries)
Sprain (13.9%)
Strain (12.5%)

SUMMARY AND CONCLUSIONS

- The NSW personnel who participated in this study experienced a significant risk of musculoskeletal injuries, especially those affecting the extremities. Further investigation into the risk factors for these injuries is necessary
- There may be a need for a customized injury prevention and performance optimization program in this NSW population
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INTRODUCTION

- Musculoskeletal injuries during sports and physical training are common in military populations
- Naval Special Warfare (NSW) personnel are an elite group of highly trained tactical athletes. There is a paucity of comprehensive descriptive epidemiology data on musculoskeletal injuries among active duty NSW personnel
- The purpose of this study was to describe both medical chart reviewed and self-reported musculoskeletal injuries, to profile the musculoskeletal injury problem in the NSW population