

Musculoskeletal Injury Epidemiology of the Naval Special Warfare Operator and Student

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Background: Musculoskeletal injuries due to physical or tactical training are the primary cause of lost duty days among military personnel. Limited published data describe injury patterns among Naval Special Warfare (NSW) Operators and Students. To quantify changes in injury risk over the course of an Operator's career, it is important to understand the type and frequency of injuries incurred during initial entry training as well as training and deployment cycles.

Methods: Self-reported musculoskeletal injury data from the previous one-year were captured from 874 Sea, Air, Land (SEAL) and Special Warfare Combatant-craft Crewman (SWCC) Operators and SEAL Qualification Training (SQT) Students (age: 28.3 ± 5.5 , 26.9 ± 5.9 , and 24.3 ± 2.7 years respectively). **Results:** Although the majority of individuals (74.9%) reported no injury during the one-year prior to survey, 28.1% of SEAL Operators, 24.6% of SWCC Operators, and 30.5% of SQT Students reported at least one injury. A total of 269 injuries were reported by 220 Operators and Students; approximately 1.2 injuries per individual. Across all three groups, most injuries affected the lower extremity (39.6 to 52.8%), upper extremity (27.0 to 35.4%), and spine (13.9 to 17.7%). SEAL Operators and SQT Students had a high occurrence shoulder, ankle, and lumbopelvic injuries (16.8 to 17.7%, 14.6 to 16.8%, and 8.3 to 13.9%, respectively). In contrast, injuries occurred most frequently to the knee (30.6%), shoulder (22.2%), and lumbopelvic region (13.9%) in SWCC Operators. Most injuries (33.3 to 54.7%) occurred during physical training for all groups except SEALs, who were injured more frequently during recreational activities/sports (30.2%). Most SEAL and SWCC Operator injuries during physical training occurred while weight lifting (40.9 to 42.1%), while most SQT Student injuries during physical training occurred as a result of running (43.6%). Sprains and strains were the most common type of injury in all groups (SEAL: 13.5% and 21.9%; SWCC: 19.4% and 11.1%; SQT: 22.6% and 15.3% respectively). Most injuries associated time loss resulted in less than 21 days of lost training days (41.7 to 69.4%), except for SEAL Operators, who reported 22.9% of injuries resulting in at least one month of lost training. **Conclusion:** SEAL Operators and Students have unique injury patterns (location, type) as compared to SWCC Operators. For injuries sustained during physical training, weight lifting was the primary activity for Operators while running was the most common for Students. SEAL Operators reported greater loss due to injury, potentially due to higher reports of surgery. Injury prevention relative to physical training may require modification to technique (or monitoring of technique), examination of volume of training (particularly relative to tactical demands), and/or alternative exercises/activities. Funded by ONR Award #N000141110929.