

# Association Between Previous Traumatic Fracture and Stress Fractures During Combat Training

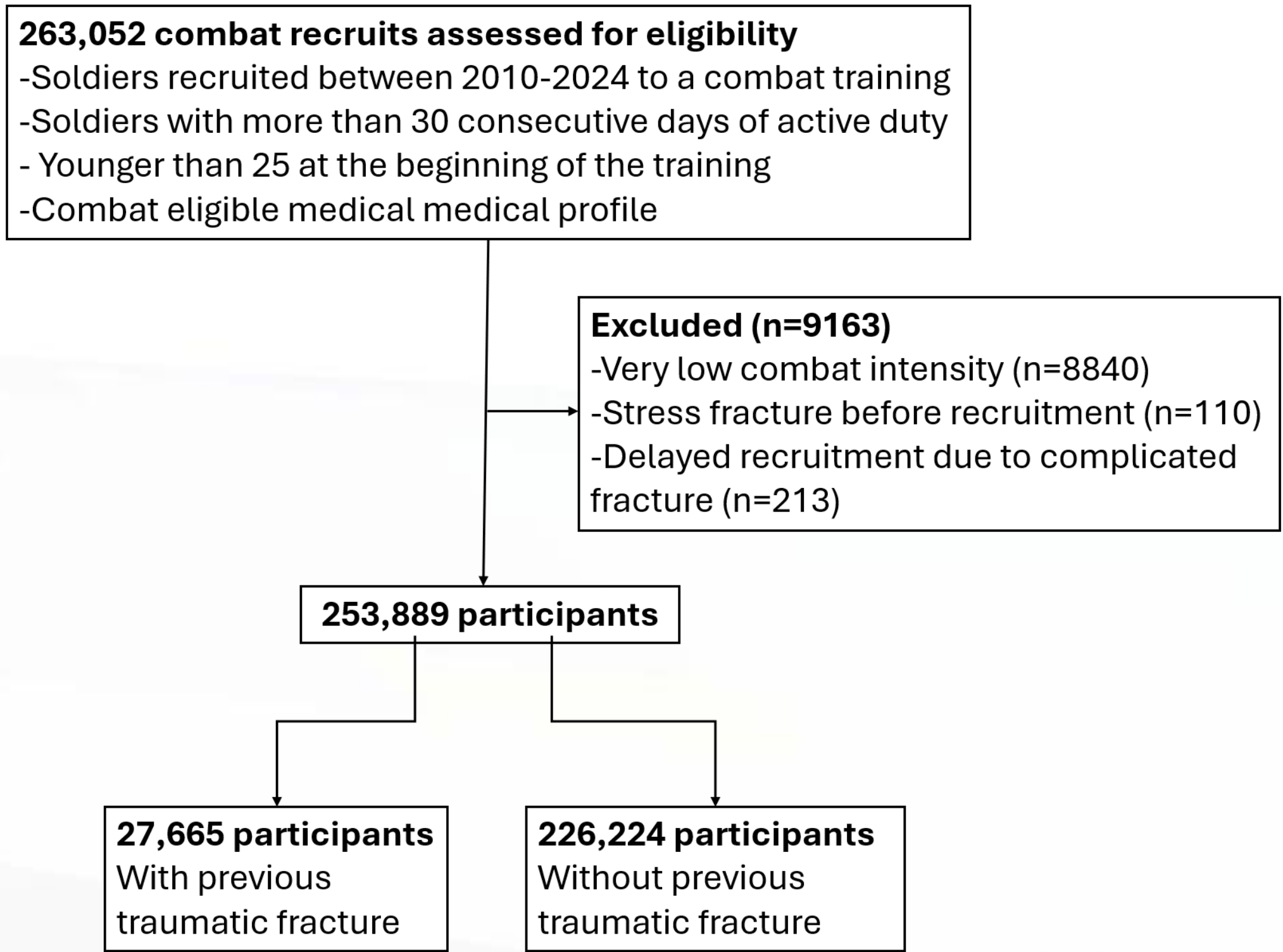
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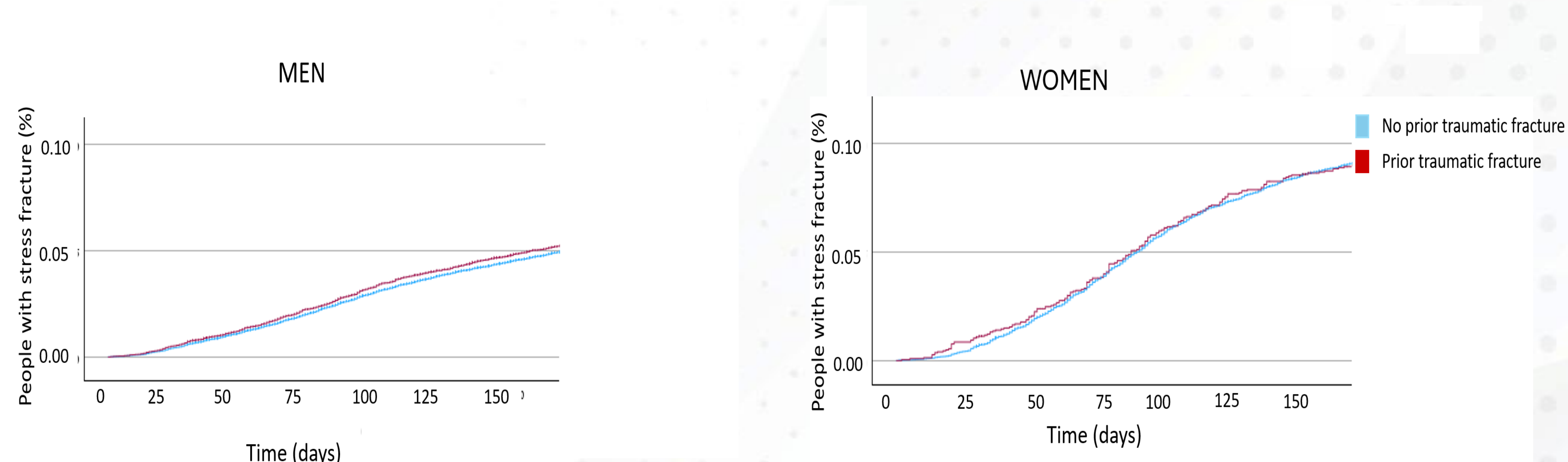
**Introduction**  
Stress fractures are common overuse injuries among military recruits, typically developing when repetitive mechanical loading outpaces the bone’s ability to remodel and repair. We evaluated whether a history of traumatic fracture is associated with the development of stress fracture during combat training.

- Methods**
- Retrospective cohort study of military recruits.
  - Exposure: History of traumatic fracture of long bones prior to recruitment.
  - Outcome & follow-up: Physician-diagnosed stress fracture during 180 days of follow-up.
  - Statistical analysis: time to event analysis using Kaplan Meier plots stratified by sex. We performed sex-stratified survival analysis with multivariable cox proportion hazards models.

Figure 1. Consort diagram



**Results**  
Of 253,889 recruits (31,745 women), 27,665 (10.9%) had a history of traumatic long-bone fracture. Incidence of stress fracture was 7.45%. The cumulative incidence was 2,055 events (7.43%) among recruits with prior traumatic fracture and 16,862 events (7.45%) among those without. In the multivariable Cox models, prior traumatic fracture was not associated with stress fracture risk among men (HR 1.04, 95% CI 0.99–1.09) or women (HR 1.03, 95% CI 0.90–1.17).



| (days)                      | 0       | 25      | 50      | 75      | 100     | 125     | 150     | 175     |
|-----------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| No prior traumatic fracture | 193,845 | 193,003 | 190,321 | 187,819 | 185,006 | 182,443 | 176,547 | 174,586 |
| Prior traumatic fracture    | 25,445  | 25,312  | 24,980  | 24,641  | 24,256  | 23,947  | 23,234  | 22,981  |

| (days)                      | 0      | 25     | 50     | 75     | 100    | 125    | 150    | 175    |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| No prior traumatic fracture | 32,377 | 32,242 | 30,427 | 29,650 | 28,792 | 28,210 | 26,715 | 26,361 |
| Prior traumatic fracture    | 2,218  | 2,199  | 2,097  | 2,046  | 1,982  | 1,938  | 1,859  | 1,831  |

**Conclusion**  
Pre-recruitment traumatic long-bone fracture was not associated with increased risk of stress fracture during early combat training. We found no evidence to support incorporating traumatic fracture history into stress fracture risk assessment in military recruits

