

Risk Factors Associated with Running Related Injuries in Physically Active Young Men.

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PURPOSE: To identify risk factors for running-related injuries (RRI) in physically active young men. **METHODS:** Personal characteristics, physical training, previous Army Physical Fitness Test (APFT) scores, and injury data were obtained by survey from men in a U.S. Army Division. APFT variables (push-ups, sit-ups and 2-mile run) were converted into quartiles (Q), where Q1 = lowest performance and Q4 = highest performance. VO_2 max was estimated from 2-mile run times. Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated using multivariate logistic regression.

RESULTS: Over 4,000 (n=4,236) Soldiers were surveyed. Average age was 26.4 ± 5.8 years. Running injury incidence in the prior 12 months was 14%. Higher mileage run for unit physical training (PT) had little effect on estimated VO_2 max, whereas, higher mileage run during personal PT increased estimated VO_2 max by 8.4%. A greater risk of a RRI was associated with older age OR $_{31+ / < 22 \text{ yrs}} = 1.62$, 95%CI 1.21-2.18, higher BMI OR $_{\text{BMI } 26-29 / < 25 \text{ kg/m}^2} = 1.34$, 95%CI 1.07-1.68, OR $_{\text{BMI} > 29 / 25 \text{ kg/m}^2} = 1.46$, 95%CI 1.06-2.00, and total distance ran per week during unit physical training (PT) OR $_{16.1 + / 1-5 \text{ miles}} = 1.66$, 95%CI 1.15-2.41. A lower risk of a RRI was associated with total distance run per week during personal PT OR $_{5.1-10 / 1-5 \text{ miles}} = 0.70$, 95%CI 0.53-0.91, OR $_{10.1-16 + / 1-5 \text{ miles}} = 0.58$, 95%CI 0.35-0.97, OR $_{16.1 + / 1-5 \text{ miles}} = 0.54$, 95%CI 0.30-0.98, higher aerobic endurance as measured by 2-mile run performance OR $_{Q4 / Q1} = 0.50$, 95%CI 0.35-0.72, OR $_{Q3 / Q1} = 0.51$, 95%CI 0.38-0.72, OR $_{Q2 / Q1} = 0.65$, 95%CI 0.49-0.87, and unit resistance training ≥ 3 times a week OR $_{\geq 3 \text{ times per week} / \text{none}} = 0.46$, 95%CI 0.29-0.73. **CONCLUSION:** Those who ran more mileage during personal PT exhibited higher levels of aerobic endurance as measured by 2-mile run time and estimated VO_2 max. Results also indicate that greater personal PT running mileage decreased injuries in this population suggesting that the increased protective effect of higher aerobic fitness outweighed the injurious effect of running more miles during personal PT. Countermeasures to prevent RRIs could entail enhancing aerobic endurance, providing opportunities for personal aerobic training, monitoring for excessive unit PT running mileage and encouraging unit resistance training ≥ 3 times per week.

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