**Table Legends:**

Table 2: Risk factors for Injuries in Female Military Personnel

Table 2 Abbreviations: RR = Relative Risk, OR = Odds Ratio, IRR = Incident Rate Ratio, HR = Hazard Ratio, 95% CI = 95% Confidence Interval, n/s = not significant, in = inches

Table 2:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Author, Year Study Type** | **Population** | **Risk Factor** | **Key Findings** | **Methodological Quality Score** |
| 1. Altarac, 2000 (22)

Cohort Study | 915 female US Army recruits in 8-week basic training | Smoking in 1 month prior to enlisting | Smoking vs not smoking. **Any injury** Traumatic Overuse **≥ 1 days lost injury.** **≥ 6 days lost**  | **aOR 1.61 [95% CI = 1.19-2.17]**aOR 1.05 [95% CI = 0.67-1.64]aOR = 1.71 [95% CI = 1.26-2.31]**aOR = 1.44 [95% CI = 1.02-2.02]****aOR = 1.75 [95% CI = 1.21-2.51]** | 92% |
| 1. Anderson, 2017 (34) Cross-Sectional Study
 | 363 female enlisted US Army soldiers | AgeBF %APFT push-upsSit-ups2-mile run time | 22-26yrs (57% injured)27-30yrs (43% injured) ≥31yrs (48% injured)≤ 19.28% 19.29-23.37% ≥ 23.38% ≥72 reps 58-71 reps ≤57 reps ≥74 reps 63-73reps **≤ 62 reps** ≤14.13mins 14.14-15.67mins ≥15.68mins  | REFERENCERR = 0.74 [95% CI = 0.30-1.80]RR = 0.88 [95% CI = 0.53-1.47]REFERENCERR = 1.05 [95% CI = 0.32-3.48]RR = 1.30 [95% CI = 0.44-3.82]REFERENCERR = 1.09 [95% CI = 0.78-1.54]**RR 1.35 [95% CI = 1.01-1.80] p=0.03**REFERENCERR = 0.92 [95% CI = 0.35-2.41]RR = 1.32 [95% CI = 0.61-2.85] | 60% |
| 1. Bedno, 2018 (3)

Cohort Study | 37,413 female US Army soldiers (lower extremity ICD=9 musculoskeletal injuries) | AgeBMI APFTCurrent smoking (Y/N)Deployment | **17-23yrs** **24-28yrs** **29-35yrs** **≥ 36yrs** Normal Underweight Overweight Obese >270 **240-269** **215-239** **<215** **(Y)** none**1** 2  | **REF****OR = 1.05 [1.01-1.10] p=0.008****OR = 1.18 [1.11-1.26] p<0.001****OR = 1.47 [1.27-1.69] p<0.001**REFERENCEOR = 1.16 [0.99-1.36] p=0.07OR = 1.04 [1.00-1.08] p=0.09 OR = 1.03 [0.90-1.18] p=0.68REFERENCE**OR = 1.11 [95% CI = 1.03-1.20] p=0.006****OR = 1.17 [95% CI = 1.09-1.27] p<0.001****OR = 1.45 [95% CI = 1.35-1.57] p<0.001****OR = 1.30 [1.23-1.36]**REFERENCE**OR = 0.65 [95% CI = 0.58-0.72] p<0.001**OR 0.73 [95% CI = 0.43-1.25] p=0.258 | 83% |
| 1. Bijur, 1997 (9)

Cohort Study | 85 female West Point Cadets | HeightMean Run time per mile | N/S7.2 min 42.1 injuries /100 cadets8.1 mins 66.7injuries /100 cadets8.7 mins 76.2 injuries /100 cadets9.8 mins 126.3 injuries / 100 cadets | 92% |
| 1. Grier, 2010 (23)
 | 3856 women prior to AIT after recently finishing BCT | AgeSmokingNumber of Cigarettes | 17-19yrs **20-24yrs** 25-29yrs**≥30yrs**Non-smokers Occasional Frequent None ≤ 10 10-20 > 20  | REFERENCE**OR = 1.29 [95% CI = 1.07-1.56]**OR = 1.29 [95% CI = 0.96-1.74]**OR = 2.02 [95% CI = 1.43-2.87]**REFERENCEOR = 1.01 [95% CI = 0.74-1.39] p=0.95OR = 0.96 [95% CI =0.80-1.15] p=0.65REFERENCEOR = 1.04 [95% CI = 0.80-1.34] p=0.77OR = 0.91 [95% CI = 0.71-1.18] p=0.48OR = 0.89 [95% CI = 0.61-1.30] p=0.55 | 70% |
| 1. Grier, 2011 (24) Cross-Sectional Study
 | 498 Women at US Army Ordinance School | AgeSmokingNumber of CigarettesInjury (Y/N)Push-upsSit-ups2 Mile Run | 17-19yrs 20-24yrs 25+yrs Non-smokers Occasional Frequent None ≤ 10 10-20 **> 20** **0-23 reps** **24-30 reps** 31-36 reps 37+ reps 0-53 reps54-60 reps61-67 reps68+ reps0-17.00 mins **17.01-18.08 mins**18.09-19.38 mins**19.39+ mins** | REFERENCEHR = 0.89 [95% CI = 0.68-1.16) p=0.39HR = 1.18 [95% CI = 0.86-1.63] p=0.32REFERENCEHR = 1.08 [95% CI = 0.67-1.73] p=0.77HR = 1.27 [95% CI = 0.98-1.63] p=0.07REFERENCEHR = 1.03 [95% CI = 0.71-1.49] p=0.89HR = 1.37 [95% CI = 0.95-1.97] p=0.09**HR = 1.71 [95% CI = 1.12-2.59] p=0.01****HR = 1.67 [95% CI = 1.21-2.30] p<0.01****HR = 1.47 [95% CI = 1.03-2.09] p=0.03****HR = 1.44 [95% CI = 1.02-2.04] p=0.04**HR = 1.04 [95% CI = 0.71-1.53] p = 0.84REFERENCEHR = 1.28 [95% CI = 0.91-1.76] p=0.16HR = 1.17 [95% CI = 0.83-1.66] p=0.36HR = 1.04 [95% CI = 0.73-1.48] p=0.82REFERENCEREFERENCE**HR = 1.46 [95% CI = 1.02-2.08] p=0.04**HR = 1.27 [95% CI = 0.88-1.83] p =0.21**HR = 2.04 [95% CI = 1.45-2.88] p<0.01** | 83% |
| 1. Heller, 2019 (25) Cohort Study
 | 227 British Army basic training recruits | 1.5 mile run time | Mean injury free time = 12min13secMean Injured time = 12min43secEvery 10 sec increase in time = 8.3% greater injury risk.  | 75% |
| 1. Henderson, 2000 (35) Cross-Sectional Study
 | 287 Combat Medic Trainees | Age Previous Injury BMIBody MassSmoking (Y/N)Activity Prior to BCTFrequency of Activity prior to BCT | <20yrs Injury Incidence 31.2% 20-25yrs Injury Incidence 21.3% **>25yrs Injury Incidence 52.9%** Y Injury incidence 29.5%N Injury Incidence 37.4%17.5-21.0 kg/m2 Injury Incidence 22.1%22.0-23.5 kg/m2 Injury Incidence 29.0%23.6-25.3 kg/m2 Injury Incidence 27.9%25.4-31.2 kg/m2 Injury Incidence 36.8%n/s p=0.30546-57kg Injury Incidence 22.4 % 58-63kg Injury Incidence 30.9% 64-68kg Injury Incidence 22.2% **69-95kg Injury Incidence 41.8%** Yes - Injury Incidence 23.6%No - Injury Incidence 31.8% (n/s p=0.190)More than most – Injury Incidence 41.9%Somewhat more than most - Injury Incidence 25.6%As active as most – Injury Incidence 29.5%Less active than most – Injury Incidence 25.0% (p=0.243)0/week – Injury Incidence 36.4%1-2/week– Injury Incidence 25.3%3-4/week– Injury Incidence 31.0%5-7/week– Injury Incidence 30.9% (p=0.623) | REFERENCEaOR = 0.7 [95% CI = 0.4-1.3]**aOR = 3.5 [95% CI = 1.5-8.1]**REFERENCEaOR = 1.5 [95% CI = 0.7-2.3]aOR =1.1 [95% CI = 0.5-2.5]**aOR = 2.4 [95% CI = 1.1-5.0]** | 75% |
| 1. Jones, 1993 (26)

Cohort Study | 186 women Army trainees | HeightBody Fat %Body mass BMIPush-upsSit-upsSelf-reported previous activityRun Time**Slow vs Fast Runners** | **Shorter 25% women at greater risk than taller 75%** N/S N/SN/SN/SN/SN/S Q1 Q2 Q3 Q4 **Any injury** **Lower body injury** **Time loss injury** **Stress Fracture** | **RR 1.7 [95% CI = 1.2-2.4] p=0.02.**RR = 1.16 [95% CI = 0.5-2.7]RR = 1.0**RR = 2.40 [95% CI = 1.2-4.8] p=0.028**RR = 2.18 [95% CI = 1.1-5.0] p=0.063**RR = 1.69 [95% CI = 1.2-2.4] p=0.004****RR = 1.78 [95% CI =1.2-2.6] p=0.004****RR = 2.12 [95% CI = 1.2-3.7] p = 0.0007****RR = 2.54 [95% CI =1.0-6.6] p=0.05** | 83% |
| 1. Jones 2017 (27)

Cohort Study | 41 727 women in Army Basic Training  | 2-mile Run timeBMISlow run time and low BMIPush-upsLow BMI & Low Push-ups | Q1 (Fastest) injury risk =26.5% **Q2 Injury risk = 35%** **Q3 Injury risk = 39.3%** **Q4 Injury risk = 44.6%** **Q5 (Slowest) Injury risk = 56.0%** **Q1 (Lowest) Injury risk = 41.9%** Q2 Injury risk = 39.1% Q3 Injury risk = 39.5% Q4 Injury risk = 39.6% **Q5 (Highest) Injury risk = 41.2%** **Injury risk 63.1%** **Low vs High 48.8% to 31.6%** **Injury risk 50%**  | REFERENCE**RR = 1.3 [95% CI = 1.3-1.4]****RR = 1.5 [95% CI = 1.4-1.5]****RR = 1.7 [95% CI = 1.6-1.8]****RR = 2.1 [95% CI = 2.0-2.2]****RR = 1.1 [95% CI = 1.02-1.1]**RR = 1.0 [95% CI = 0.9-1.0]REFERENCERR = 1.0 [95% CI = 0.9-1.1]**RR = 1.04 [95% CI = 1.01-1.08]****RR = 2.6 [95% CI = 2.3-2.8], p<0.00001****RR = 1.5 [95% CI = 1.49-1.61] p<0.00001****RR 1.7 [95% CI = 1.6-1.9]** | 83% |
| 1. Knapik, 2001 (36)

Cohort Study | 474 women in Army Basic Training | AgeHeightMassBMI**3.2km Run time****Push-ups**Sit-ups**Smoking****VO2max** | 17-20yrs 20-25 yrs 25-35yrs 58-62in 63-64in 65-66in 67-74in 90-119lbs 120-134lbs 135-150lbs151-239lbs15.81-20.54m/kg220.55-22.98m/kg222.99-25.01m/kg225.02-33.21m/kg213.00-19.48mins19.49-21.65mins**21.66-23.48mins****23.49-28.68mins****0-2 reps****3-5 reps****6-13 reps**14-50 reps0-22 reps23-33 reps34-44 reps45-80 reps**Y/N****> 20 Cigarettes/day****29.9-37.0ml/kg/min**  | REFERENCERR = 1.0 [95% CI = 0.8-1.3] RR = 1.3 [95% CI = 0.9-1.9] REFERENCERR = 1.0 [95% CI = 0.7-1.4] p=0.89RR = 1.3 [95% CI = 0.9-1.9] p=0.22RR = 1.0 [95% CI = 0.7-0.4] p=0.85REFERENCERR = 1.0 [95% CI = 0.7-1.4] p=0.93RR = 1.0 [95% CI = 0.7-1.5] p=0.84RR = 1.1 [95% CI = 0.8-1.6] p=0.47REFERENCERR = 1.3[95% CI = 0.9-1.9] p=0.15RR = 0.9 [95% CI = 0.7-1.4] p=0.78RR = 1.3 [95% CI = 0.9-1.9] p=0.10REFERENCERR = 1.5 [95% CI = 1.0-2.3] p=0.06**RR = 1.6 [95% CI =1.0-2.3] p=0.04****RR = 1.9 [95% CI =1.2-2.8] p<0.01****RR = 1.6 [95% CI =1.1-2.5] p=0.02****RR = 1.6 [95% CI =1.1-2.3] p=0.02****RR = 1.6 [95% CI =1.1-2.4] p=0.02**REFERENCERR = 1.3 [95% CI =0.9-2.0] p=0.14RR = 1.2 [95% CI =0.8-1.8] p=0.29RR = 1.1 [95% CI =0.7-1.6] p=0.66REFERENCE**RR = 2.0 [95% CI =12-3.5] p=0.01** **RR = 1.4 [95% CI = 1.9-10.0] p<0.01****RR = 2.8 [95% CI =1.4-5.6] p<0.01** | 92% |
| 1. Knapik, 2009 (29) Cohort Study
 | 451 women in Army Basic Training | **Age****Previous injury (Y/N)**BMI**Push-ups****Sit-ups****2 Mile Run****Smoking****Frequency of ex before BCT****Frequency of running before BCT**  | 17.0-19.9yrs 20.0-24.9yrs **25.0-29.9yrs** **≥30yrs** **(Y)**15.20-22.12kg/m2 21.30-23.80kg/m223.81-25.97kg/m225.98-34.02kg/m2**0-4 reps** 5-13 reps 14-22 reps 23-62 reps **0-20 reps**21-33 reps34-46 reps47-89 reps12.3-19.4min 19.5-22.1min 22.2–24.7min **24.8-31.3min** **0****1-9/day** **10-19/day** **≥20/day** **≤1/week** **≤1/week**  | REFERENCEHR = 1.02 [95% CI =0.85-1.23] p=0.84**HR = 1.30 [95% CI =1.01-1.66] p=0.04****HR = 1.43 [95% CI =1.12-1.84] p<0.01****HR = 1.41 [95% CI =1.13-1.75] p<0.01**REFERENCEHR = 0.89 [95% CI = 0.71-1.11] p=0.30HR = 0.91 [95% CI = 0.73-1.13] p=0.40 HR = 0.89 [95% CI = 0.71-1.11] p=0.28**HR = 1.92 [95% CI =1.41-2.59] p<0.01**HR = 1.36 [95% CI =0.99-1.86] p=0.06HR = 1.20 [95% CI **=**0.87-1.65] p=0.27REFERENCE**HR = 1.75 [95% CI = 1.29-2.37] p<0.01**HR = 1.34 [95% CI = 0.98-1.83] p=0.07HR = 1.10 [95% CI = 0.79-1.51] p=0.58REFERENCEREFERENCEHR = 0.99 [95% CI =0.71-1.38] p=0.94HR = 1.14 [95% CI =0.82-1.59] p=0.43**HR= 2.18 [95% CI =1.60-2.98] p<0.01**REFERENCE**HR = 1.44 [95% CI =1.19-1.73] p<0.01****HR = 1.47 [95% CI =1.17-1.89] p<0.01****HR = 1.90 [95% CI =1.34-2.68] p<0.01****HR 1.41 [95% CI =1.09-1.82p p<0.01****HR = 1.62 [95% CI =1.16-2.27] p<0.01** | 100% |
| 1. Kodesh, 2015 (30) Cohort Study
 | 158 females on Combat Fitness Instructor Course | Power Performance including 10m sprint, single leg triple hop drop jump, CMJ. Body Fat %BMIFMS2km Run | All power tests n/s except **L triple hop (cm) 418 (254-559) vs 446.5 (199-584) p=0.029****R triple hop distance (cm) 434 (287-536) vs 460 (263-546) p=0.047)****BF% 23.7 (20.5-29.2) vs 22.5 (14.9-31.5) p=0.047.**BMI 21.14 [18.06-25.79) injured vs 20.70 [16.16-32.03] not injured.FMS n/s**258 (578-776) sec vs 640 (488-804) sec p=0.044** | 67% |
| 1. Krauss, 2016 (31) Cohort Study
 | 1900 US Army recruits during first 183 days of service | Fit vs unfitFit (high % BF vs low % BF) | **Non stress fracture** **Stress fracture** **Non stress fracture** Stress fracture  | **IRR = 1.32 [95% CI =1.14-1.53]** **IRR = 1.62 [95% CI =1.19-2.21]****IRR = 1.27 [95% CI =1.07-1.50]**IRR = 0.79 [95% CI =0.49-1.28] | 75% |
| 1. Rappole, 2018 (1) Cohort Study
 | 369 US female Army Soldiers | Age2-mile runPush-upsSit-upsUnit PT resistance trainingPersonal PT run distancePersonal PT interval freq | n/sn/sn/sn/s (at 0.05)**≥1/week** > 1 mile **None/<1/week**  | **OR 1.96 [95% CI =1.20-3.21] p <0.01** OR 1.57 [95% CI =0.98-2.52] p = 0.06**OR 1.64 [95% CI =1.00-2.71] p=0.05** | 67% |
| 1. Roy, 2014 (2) Cohort Study
 | 625 in Us Army units | Deployment Injury History (Y/N)2-mile Run timeUnit Runs/weekPers. PT/weekAPFT score | 01 ≥2 **(Y)** ≤17mins **17.01-18.0** > 18mins **0** 0 **1-2** ≥3 **<220** **220-249** **250-289** ≥290  | RR = 1.48 [**95% CI =**1.02-1.71]RR = 1.22 [**95% CI =**0.84-1.78]REFERENCE**RR = 2.6 [95% CI =2**.06-3.28]REFERENCE**RR = 1.71 [95% CI = 1.07-2.73]**RR = 1.41 [95% CI = 0.90-2.19]**RR= 1.526 [95% CI =1.07-2.19]**REFERENCE**RR = 1.42 [95% CI =1.08-1.87]**RR = 1.31 [95% CI =0.94-1.83]**RR= 1.74 [95% CI =1.01-3.02]** **RR = 2.01 [95% CI =1.19-3.38]****RR = 1.7 [95% CI =1.02-2.86]**REFERENCE | 75% |
| 1. Roy, 2015 (33) Cohort Study
 |  | Work typeMiles walked/day.Avg worn load.Weight of avg lifted object | **Physically demanding** **>4** **>30lb** **>50lb**  | **RR = 6.0 [95% CI = 1.50-23.99]** **RR = 3.0 [95% CI = 1.52-5.93]** **RR = 2.44 [95% CI = 1.7-4.36]** **RR = 2.3 [95% CI = 1.19-4.45]** | 67% |
| 1. Roy, 2016 (32) Cohort Study
 | 160 deployed female soldiers | * Wearing load
* Wearing armour
* Wearing backpack
* Occupational Tasks
* Y balance score
 | **>10% body weight****Heaviest load >15%****1 hr – 4 hr****> 4 hrs****Y****Lifting >22.68kg****Lifting objects 1-2 x day****Carrying objects > 7.62m****< 95.23** | **RR = 2.0 [95% CI = 1.31-3.06]****RR = 5.83 [95% CI = 1.51-22.50]****RR = 1.62 [95% CI = 1.002-2.62]****RR = 1.84 [95% CI = 1.03-3.27]** **RR = 1.85 [95% CI = 1.23-2.80]** **RR = 1.96 [95% CI = 1.08-2.97]****RR = 1.73 [95% CI = 1.002-2.97]****RR = 2.01 [95% CI = 1.19-3.42]****RR = 1.71 [95% CI = 1.13-2.60]** | 100% |