**Supplemental Digital Content 4: Study methodological characteristics and results for the association between muscular endurance and MSK-I in males.**

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| **Author, Country, Population** | **Quality** | **Sample Size** | **Follow-Up** | **MSK-I Type** | **Fitness Test** | **Strength of Association** |
| **Crude Association** | **Association with Adjustments** | **Direction of Association** |
| **Push-Ups** |  |  |  |  |  |  |  |  |
| Finestone et al. (14),Israel, Army (BCT) | Poor | 29 | 16 wk | Overuse(Stress Fx) | PUuntil failure | NS | NS | ≠ |
| Allison et al. (1),USA, Army (BCT) | Poor | 518 | 9 wk | Overuse | 1-minPU | No data provided | No data provided | ≠ |
| Knapik et al. (35),USA, Army (BCT) | Poor | 1,174 | 9 wk | A/T & O | 1-minPU | ***Lowest 2 quartiles:***RR=1.63 (1.1-2.27, *p<*0.01) RR=1.93 (1.3-2.70, *p˂*0.01) | -- | + |
| Jones et al. (28),USA, Army (BCT) | Poor | 97 | 8 wk | A/T & O | 2-minPU | ***Lowest 3 quartiles:*** RR=5.0 (1.1-25.8, *p=*0.04) | -- | + |
| Knapik et al. (31),USA, Army (BCT) | Fair | 351 | 8 wk | A/T & O | 2-minPU | -- | ***Lowest 2 quartiles:*** OR=2.5 (1.0-6.6) OR=3.1 (1.2-8.0) | ++ |
| Knapik et al. (37),USA, Army | Fair | 147 | 1 year | A/T & O | 2-minPU | NS | NS | ≠ |
|  |  |  |  |  |  |  |  |  |
| **Sit-Ups** |  |  |  |  |  |  |  |  |
| Finestone et al. (14),Israel, Army (BCT) | Poor | 29 | 16 wk | Overuse(Stress Fx) | SUuntil failure | NS | NS | ≠ |
| Allison et al. (1),USA, Army (BCT) | Poor | 518 | 9 wk | Overuse | 1-minSU | NS | NS | ≠ |
| Knapik et al. (35),USA, Army (BCT) | Poor | 1,174 | 9 wk | A/T & O | 1-minSU | NS | -- | + |
| Jones et al. (28),USA, Army (BCT) | Poor | 98 | 8 wk | A/T & O | 2-minSU | NS | -- | ≠ |
| Knapik et al. (31),USA, Army (BCT) | Fair | 351 | 8 wk | A/T & O | 2-minSU | NS | NS | ≠ |
| Knapik et al. (37),USA, Army | Fair | 152 | 1 year | A/T & O | 2-minSU | NS | NS | ≠ |

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| **Pull-Ups** |  |  |  |  |  |  |
| Blacker et al. (4),England, Army (BCT) | Fair | 13,417 (M=11,937F=1,480) | 12 wk | A/T & O | Max. number of heaves | ***Highest quintile:******Medical Discharge:*** HR=0.56 (0.35-0.87, *p*<0.05)***All groups compared to lowest # of heaves:******Medical Referral:*** HR=0.30 (0.24-0.38, *p*<0.001) HR=0.43 (0.35-0.52, *p*<0.001) HR=0.44 (0.35-0.55, *p*<0.001) HR=0.56 (0.46-0.69, *p*<0.001) | NS | + |
| **Tests to Failure/ Fatigue & Other** |  |  |  |  |  |  |
| Blacker et al. (4),United Kingdom, Army (BCT) | Fair | 13,417 (M=11,937F=1,480) | 12 wk | A/T & O | Static Arm Endurance – Ammo Can Hold | ***Middle quintile:******Medical Discharge:*** HR=2.05 (1.04-4.04, *p*<0.05) ***Top 2 quintiles:******Medical Referral:*** HR=0.47 (0.37-0.60, *p*<0.001) HR=0.42 (0.33-0.55, *p*<0.001) ***Second lowest quintile:******Medical Referral:*** HR=0.50 (0.38-0.66, *p*<0.001) | NS | + |
| Gabbett et al. (16), Australia, Rugby | Fair | 66 | 3 years(3 seasons) | Contact Injury | 60kg Bench Press until failure | -- | NS | ≠ |
| Leetun et al. (42), USA, Collegiate Basketball & Cross-Country Athletes | Fair | 140(M=60F=80) | One athletic season | A/T & O | Side Bridge Hold | -- | NS | ≠ |
| Beiring-Sorensen Test | -- | NS | ≠ |

BCT=Basic Combat Training, A/T & O=Acute/Traumatic and Overuse, PU=Push-Up, SU=Sit-Up, RR=Risk Ratio, HR=Hazard Ratio, OR=Odds Ratio, NS=Non-Significant

++, Significant multivariate association between low ME/MS and increased MSK-I risk

+, Significant univariate association between low levels of ME/MS and increased MSK-I risk

- -,Significant multivariate association between high levels of ME/MS and increased MSK-I risk

- ,Significant univariate association between high levels of ME/MS and increased MSK-I risk

≠, No significant association