

## The use of fitness testing to predict survivability in selection of specialist tactical personnel

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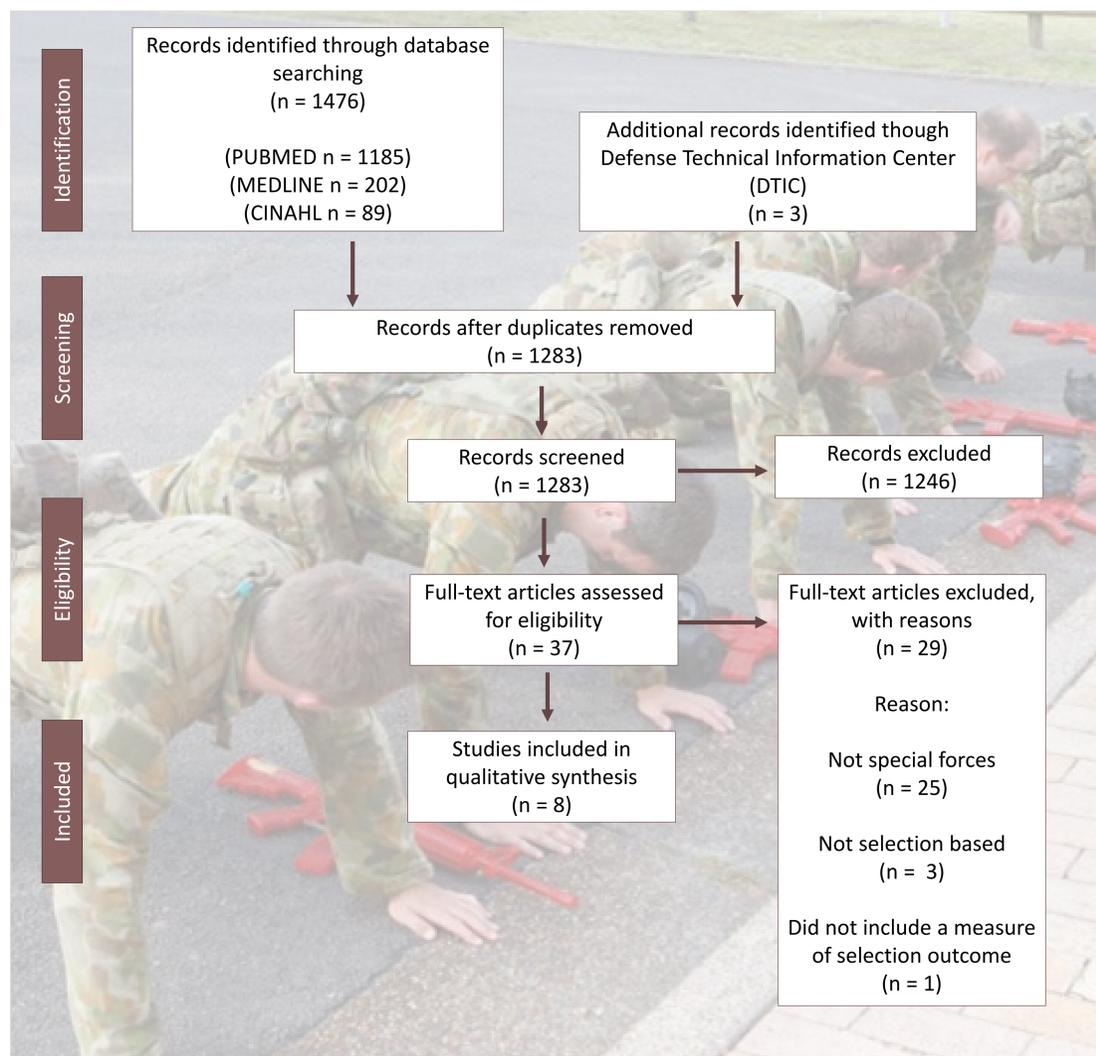
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## INTRODUCTION

- Specialist personnel, like police officers serving in Special Weapons and Tactics (SWAT) teams or military Special Forces are highly-trained individuals who play a vital role in both national and international operations. Their skills usually exceed the capabilities and training level of general law enforcement or military personnel [1].
- In order to be selected into a specialist unit, candidates must typically complete some form of selection testing which assesses the candidate's ability to meet a stringent physical fitness standard and as well as their suitability for specialist service [2].
- Given the benefit of specialist selection fitness testing, but potential conflicts in findings, the aims of this critical review were to identify, critically appraise and to synthesise the findings of current literature on the use of fitness testing to predict specialist personnel selection and to present their findings.

## METHODS

- A three-step approach was used to locate all relevant studies to inform this critical review (see Figure 1).
- The first step was a search of three different key databases (Pubmed, CINAHL and Medline) using dedicated search terms.
- Once all relevant articles were obtained, duplicates were removed. The articles were then screened by title and abstract for relevance by three reviewers (JS, JS and RT) to reduce selection bias with the following inclusion criteria:
  - Must contain tactical personnel
  - Must contain a selection or specialist training process, and
  - Must contain a fitness measure
- Articles were excluded based on the following exclusion criteria:
  - Non-specialist
  - Not selection based, or
  - Did not include a measure of selection outcome
- All studies were critically appraised using the CASP cohort study checklist with the interrater agreement calculated via Krippendorff's Alpha coefficient.
- The final Critical Appraisal Scores (CAS) of the CASP were calculated by the averaging of the three rater scores for each paper (out of 12).



**Figure 1.** PRISMA flow chart depicting screening and selection process for critical review.

Article	PUSH	PULL	SU	1RMS	LC	BT	2MR/ 3.2KM	5KM	VO <sub>2</sub>	RM	AC	CASP
Orr (2018)	✓	✓	✓	—	✓	—	—	—	—	—	—	12
Hunt (2013)	✓	—	—	—	—	—	✓	✓	—	✓	—	11
Pleban (1988)	*	—	*	—	—	—	*	—	—	—	—	12
Allsopp (2004)	—	—	—	—	—	✓	—	—	—	—	✓	10.7
Zazanis (1999)	*	*	*	—	—	—	*	—	—	—	—	8
Carlson (2012)	—	✓	—	✓	—	—	—	—	✓	—	—	12
Vrijkotte (2017)	—	—	—	—	—	—	—	—	—	—	—	11.7
Teplitzky (1991)	✓	—	✓	—	—	—	✓	—	—	✓	—	9

**Key:** ✓ = statistically significant (p<0.05), \* = Positive correlation but not statistically significant, — = Not assessed or assessed with no relationship found, PUSH = Push-ups, PULL = Pull-ups, SU = Sit-ups, 1RMS = 1RM Squats, LC = Lift and carry, BT = Bleep test, 2MR = 2-mile run/ 3.2KM = 3.2km Battle run, 5KM = 5-km March, VO<sub>2</sub> = VO<sub>2</sub> peak, RM = Ruck march with load, AC = Assault course, CASP = CASP Score (12)

**Table 1.** Reported physical fitness measures associated with successful selection.

## RESULTS & SYNTHESIS

- The mean CASP score of the eight studies was 10.8 ±1.4, the scores ranged from 8 to 12, with the most rater disagreement on Question 11.
- The Krippendorff's alpha indicated a strong agreement between the three raters (k = 0.733).
- Of the 8 studies included, 7 included military special forces and 1 specialist police.
- It was found in 4 out of the 8 studies analysed that push-ups, pull-ups and/or sit-ups were statistically associated with successful selection (see Table 1) [2, 4, 5, 6].
- Of the 8 studies reviewed, 5 studies reported that aerobic fitness measures were indicative of success (bleep test, 2-mile run and ruck/pack march) (see Table 1) [2, 3, 5, 7, 9].

## CONCLUSIONS & IMPLICATIONS

From the literature reviewed, there were conflicting results as to which fitness measures are associated with successful selection into a specialist force. Upper body and trunk strength and endurance were identified as being associated with successful selection. Possessing a high aerobic capacity and the ability to carry load over a longer distance were also of importance. Measures that are most associated with success may be course specific.

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