

A systematic review of human performance optimisation in paramedicine

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This study aimed to ascertain if integrated HPO programs, assessments and interventions are being undertaken to improve outcomes for paramedics and/or patients.

We identified a need for more comprehensive, whole-of-body interventional studies using HPO methodology to enhance paramedic health, occupational performance, and patient care.



Introduction

Paramedics face significant health risks due to shift work, poor diet, lack of physical activity and psychological stressors.¹ Increased allostatic load² may compromise both paramedics' health and patient care standards. The concept of human performance optimisation (HPO) is rooted in elite sports and the military,³ and may offer improved outcomes for patients and paramedics through comprehensive strategies to address discrete components of health and performance.

Methods

Studies were included if they featured investigations of two or more of the defined components of HPO including sleep, physical fitness, nutrition, psychological health, were experimental or observational in nature, and participants were paramedics who have worked clinically in the previous 12 months. A systematic search of PubMed, EMBASE, MEDLINE, CINAHL, the Cochrane Central Register of Controlled Trials for articles published between January 2000 and December 2023 was undertaken.

- We used the JBI Critical Appraisal tools to assess study quality.
- The study was registered with PROSPERO (CRD42024508752)

Results

Thirteen studies were included for analysis in the review. Studies were heterogenous in nature and were of poor to fair quality. Most studies were cross sectional and observational in nature, assessing primarily physical components HPO, mainly strength and cardiovascular fitness. No studies reported on the effectiveness of intervention strategies. Only three studies included assessments of psychological health. No literature that met eligibility criteria addressed all components of HPO.

Conclusion

The studies in this review underscore the varied physical and health challenges faced by paramedics. Interventional studies in this population are lacking, and there are few studies reporting on a whole-of-body approach. An opportunity exists to evaluate interventions using HPO methodology to improve paramedic occupational health and performance, and patient care.

References

1. Kecklund G, Axelsson J. Health consequences of shift work and insufficient sleep. *BMJ* 2016; 355 :i5210
2. McEwen BS, Stellar E. Stress and the individual: Mechanisms leading to disease. *Archives of Internal Medicine*. 1993;153(18):2093-101.
3. Deuster PA, O'Connor FG. Human performance optimization: culture change and paradigm shift. *The Journal of Strength & Conditioning Research*. 2015;29:S52-S6.

Figure 1: PRISMA diagram

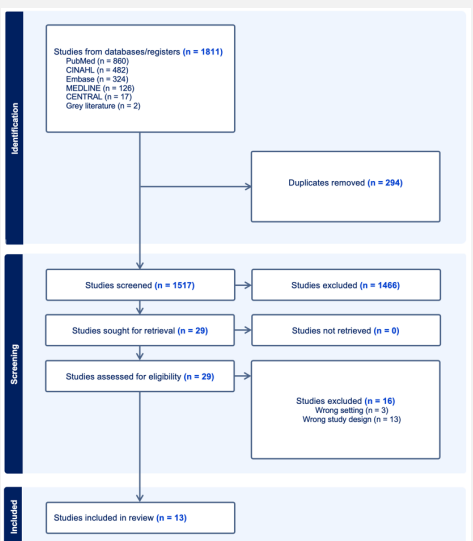


Table 1: HPO elements in studies

Aerobic endurance	Muscular power
Anaerobic endurance	Muscular strength
Body composition	Physical activity
Cardiometabolic health	Psychological health and psychosocial factors
Diet and nutrition	Sleep health
Flexibility	Weight management
Mobility	Work-related injury and illness
Muscular endurance	



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