



Introduction

Measuring Paramedic Performance

The measurement of paramedic performance has traditionally focused on competency assessment to a minimum standard to ensure practitioner safety.¹ There is limited investigation of conceptualising paramedic performance on a spectrum of mastery. Additionally, there is limited exploration of the assessment, and education, of paramedics in a holistic lens looking at a combination of attributes and factors which impact paramedic performance.

Paramedic practice is often seen as a homogenous set of skills and abilities, and while minimum competencies exist to ensure patient safety, they do not recognise the innate variance of different practitioners and their respective strengths and weaknesses. Resultingly, there is a drive to reach competence, but little incentive for paramedics to train, educate, or practice towards mastery or even just higher-level functionality based on the individual's capability beyond minimal competency.

Human Performance Optimisation

Human Performance Optimisation (HPO) is defined by Myers as "a training and maintenance paradigm utilizing the pillars or human factors to improve human physiological and cognitive responses and adaptations to austere environmental factors, improve regeneration and resiliency, and improve medical care from a reactive to a preventative state."²

The HPO approach originated in elite sport and is increasingly being adopted by the military to improve performance. Three domains are commonly included in HPO models. Physical performance considers the physical capacity of the individual. Cognitive performance considers areas such as decision-making, cognitive processing, and situational awareness. Socio-cultural understanding considers both capacity of the individual to operate in a specific social context as well as navigate human relationships such as team dynamics.³

Military Applications of HPO

HPO is commonly used by the military as a method of maximising the operational effectiveness of small teams working to complete complex tasks or outcomes. Military HPO is often focused on scenarios or situations which have specific mission parameters with clearly defined levels of success.

HPO in the military context is also seen as a protective activity. Performance optimisation focuses on maximising an individual's operational ability by leveraging their capabilities and strengths within a team. Having an individual operating at their greatest capacity increases emotional and cognitive flexibility, as well as inherent resilience and responsiveness to adverse events. Supporting an individual's strengths furthers the team's ability to function as a cohesive unit.

Literature Review

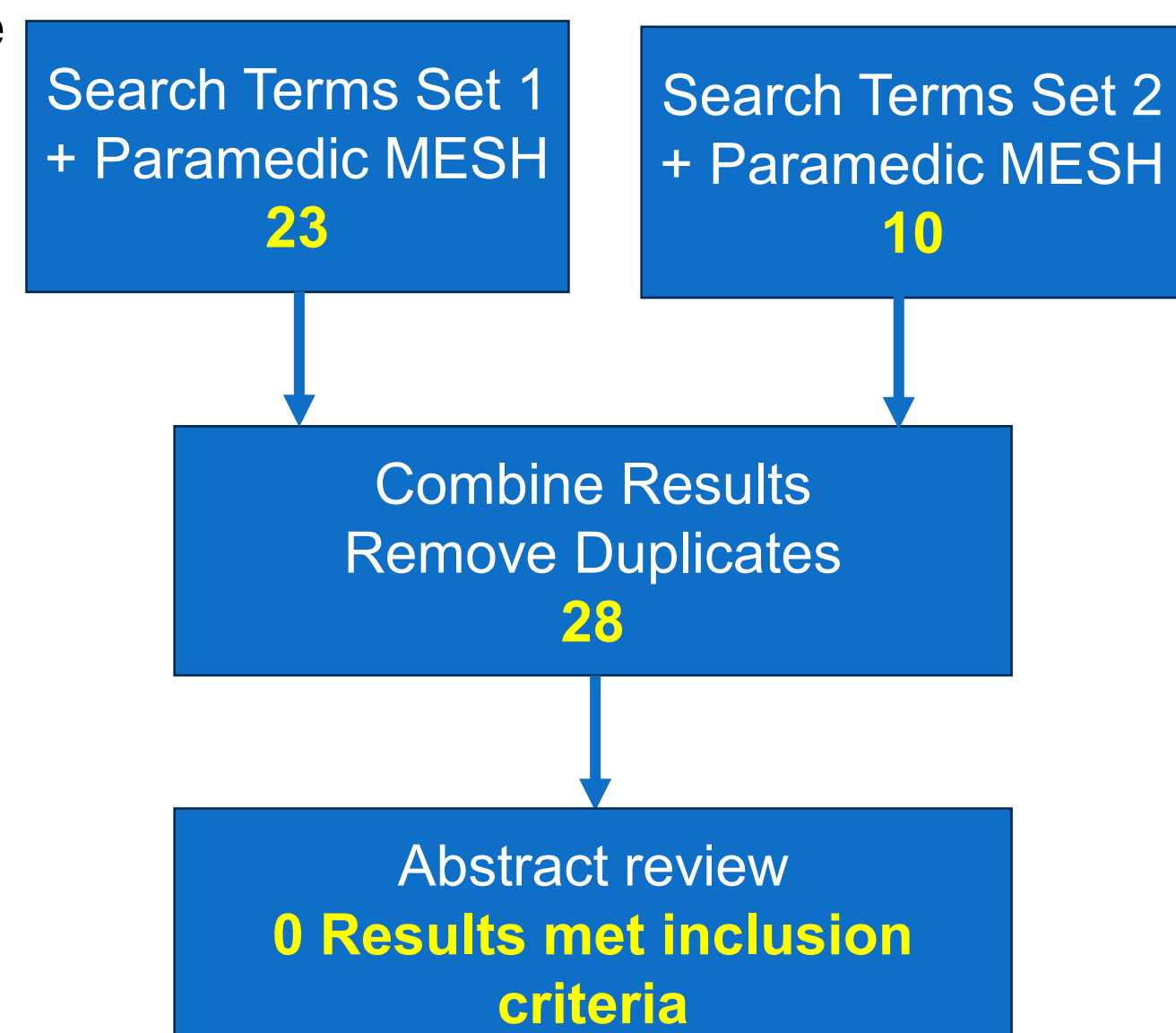
A literature review was undertaken using the following terms:

Search Term Set 1	Search Term Set 2
Human Performance Optimi?ation, OR Human performance modification, OR Human performance, OR Human performance enhancement	Capability Optimi?ation, OR Capability development, OR Capability assessment, OR Capability management, OR Capability Speciali?ation
AND (Paramedic MESH Workaround) ⁴	
Ambulances.sh OR Emergency Medical Technicians.sh OR Air Ambulances.sh OR emergency medical services.sh OR paramedic*.tw OR ems.tw OR emt.tw OR prehospital.tw OR pre-hospital.tw OR first responder*.tw OR emergency medical technicians.tw OR emergency services.tw OR Ambulance*.tw OR HEMS.tw OR field triage.tw OR out-of-hospital.tw	

The following databases were searched: EBSCO Health, Ovid EmCare, OVID EMB, CINAHL, Medline

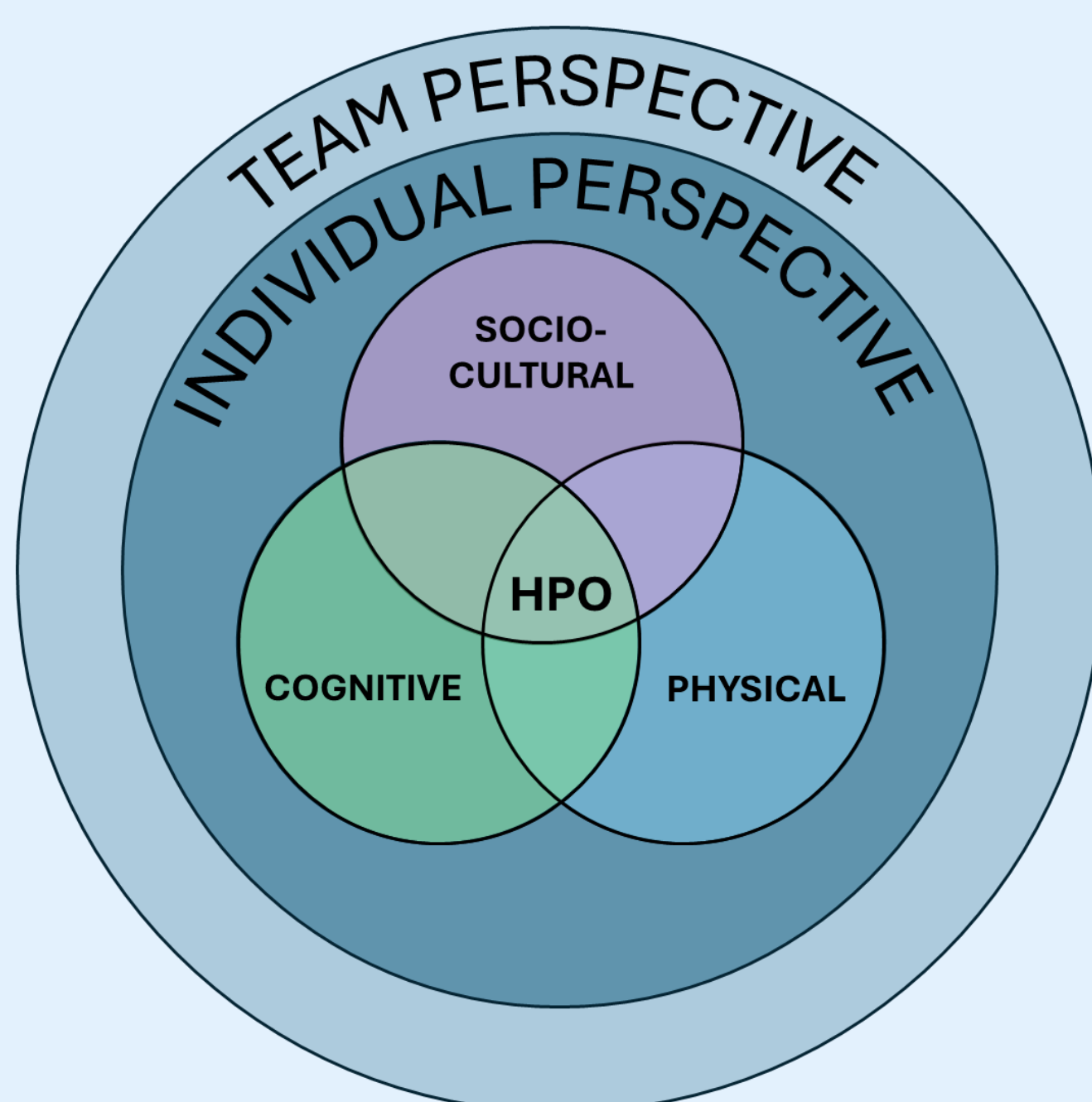
Inclusion criteria:

- Discusses HPO or holistic performance framework/assessment
- Applied to paramedicine or out-of-hospital care
- Full text available
- Text in English



Elements of HPO

There are several different frameworks for HPO. The framework most likely to be relevant to paramedicine include the three pillars of physical, cognitive and socio-cultural domains within both an individual and team perspective.³



Discussion

The military application of HPO includes elements that potentially have utility in paramedicine. Despite the existence of frameworks for specific elements of paramedicine there is the lack of a comprehensive framework for holistic paramedic performance in a real-world although there are increasing models for assessing simulated performance in an educational setting.^{1,5}

The transferability of military HPO models will rely on the alignment between concepts of paramedic performance and military performance. Some of the potential challenges include:

- Military practice is often mission focused with clear, defined goals. Military goals often follow a dichotomy where the outcomes are achieved or not achieved. In contrast, paramedicine often involves more nuanced goals with more variable levels of operational success.
- Military activities are more commonly planned and rely on intelligence to guide mission parameters. Paramedicine exists largely to manage unplanned or unscheduled healthcare issues with minimal intelligence prior to operational engagement by paramedics.
- Military models have a high level of emphasis on physical fitness and tactical athleticism due to the nature of many military activities. While paramedicine often includes physical tasks that require some fitness, they are less critical to the achievement of operational goals.

There is often a view of paramedicine which supports a homogenous practitioner that is expected to have a level of mastery in all aspects of practice.⁶ This approach discounts the natural variation in human capability and as a result does not provide incentive for individuals to excel at areas of interest or areas of natural aptitude.

HPO potentially provides a framework to optimise the capability of each individual. This allows for the leveraging of inherent abilities and increase an individual's capability to manage adverse events. The result is both individuals and teams operating at a higher baseline capability than would be expected from an isolated individual. HPO also has synergies as a wellness model with Salutogenesis which has been increasingly found to have application within paramedicine.^{7,8}

Future Research

Understanding Performance

The concept of "performance" in paramedicine is nebulous. There is no comprehensive framework designed to measure the various elements of paramedic performance or their underpinning traits in a holistic way that effectively addresses real-world practice. Further work needs to be done on measuring paramedic performance beyond minimum competency. Through better understanding of performance, it will be easier to evaluate specific performance domains.

Impacts of HPO on wellbeing

One element of the application of HPO in the military involves increasing the flexibility of the individual, and by extension the team, to cope with adverse events and dynamic environments. This concept is based on the premise that individuals and teams operating at peak performance are inherently more resilient, and have a higher baseline level of emotional, social and psychological flexibility. There is preliminary research into the application of HPO in other emergency services as a wellness-supporting framework.⁹

Leveraging paramedic roles to maximise strengths

There are no structures within paramedicine that encourage individuals to maximise strengths. Rather, paramedicine has traditionally adopted a culture of "extreme generalists". While basic competency in a range of key areas is important for patient safety, paramedicine often does not create spaces where individuals with unique strengths can excel. Structures of performance that allow for diversity in strength and capability ultimately lead to greater overall performance through leveraging of individual strengths. This approach is likely to support unique capability profiles, for example, neurodiverse practitioners, or those with specific life experiences that have led to capabilities outside of the traditional paramedic training. The concept of paramedic performance must be further examined to allow for the uniqueness of individuals and build strength and resilience within teams.

References

1. Tavares W, Boet S. On the Assessment of Paramedic Competence: A Narrative Review with Practice Implications. *Prehospital and Disaster Medicine*. 2016;31(1):64-73. doi:10.1017/S1049023X15005166
2. Myers C. What Is Human Performance Optimization?. In *The Human Weapon System 2023* Nov 11 (pp. 21-29). Cham: Springer Nature Switzerland.
3. Dugan C, Stanciu RI, Vizitiu C. Human Performance Optimisation Concept Development and Applications in the Military Field. *Romanian Military Thinking*. 2022 Apr 1(2).
4. Olausson A, Semple W, Oteir A, Todd P, Williams B. Paramedic literature search filters: optimised for clinicians and academics. *BMC medical informatics and decision making*. 2017 Dec;17:1-6.
5. Gugiu MR, Cash R, Rivard M, Cotto J, Crowe RP, Panchal AR. Development and validation of content domains for paramedic prehospital performance assessment: a focus group and Delphi method approach. *Prehospital Emergency Care*. 2021 Feb 23;25(2):196-204.
6. Hill L, Eaton G. Exploring paramedic professional identity. *British Paramedic Journal*. 2023 Dec 1;8(3):42-51.
7. Antonovsky A. Salutogenesis and the Mental Health of First Responders. 2022 Jan 1. In: Mittelmark MB, Bauer GF, Vaandrager L, et al., editors. *The Handbook of Salutogenesis* [Internet]. 2nd edition. Cham (CH): Springer; 2022. Chapter 50. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK584101/> doi: 10.1007/978-3-030-79515-3_50
8. Cockrell K, Reed B, Wilson L. Rural paramedics' capacity for utilising a salutogenic approach to healthcare delivery: A literature review. *Australasian Journal of Paramedicine*. 2019;16:1-9.
9. Romero M, Alvar B. A new model for optimizing firefighter human performance. *Strength & Conditioning Journal*. 2021 Aug 1;43(4):19-31.



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