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Association Between Physical Fitness and Operational Performance in Relief Workers, Firefighters, and Disaster Responders: A Narrative Review

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Original Article

Abstract

INTRODUCTION: Physical fitness is one of the factors associated with the ability of relief personnel and disaster responders to perform operational tasks. During rescue and relief missions, these personnel undertake activities such as carrying and transporting casualties, moving equipment, traversing difficult terrain, and performing strenuous physical activities under adverse environmental conditions. Given the scattered nature of the available evidence and the differences in occupational groups and performance assessment indicators, this study aimed to review and synthesize the evidence on the association between physical fitness and the operational performance of relief workers and disaster responders.

METHODS: This study was a narrative review. Persian-language sources were searched in the SID, Magiran, Civilica, and ISC databases. English-language sources were searched in PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar. The search covered publications from January 2013 through June 2026. A total of 548 records were identified, including 154 Persian-language and 394 English-language records. After screening titles and abstracts, 126 records were excluded, and the full texts of the remaining 422 records were assessed. Finally, 14 sources, including 4 Persian-language and 10 English-language sources, were included. Their findings were analyzed using narrative and thematic synthesis.

FINDINGS: The evidence indicated that cardiorespiratory fitness was associated with performance in simulated firefighting task tests. Muscular strength and endurance were also identified in some studies as factors associated with the performance of operational tasks; however, the evidence in this area was more limited. Furthermore, all identified direct quantitative evidence concerned firefighters, while evidence on other relief groups, particularly Iranian Red Crescent Society (IRCS) relief workers and prehospital emergency personnel, was limited. The review also showed that physical fitness, work capacity, operational performance, fatigue, and occupational injury are distinct concepts and should not be interpreted as interchangeable indicators.

CONCLUSION: Physical fitness is associated with some aspects of the ability to perform operational tasks. However, the nature and extent of this association depend on the type of mission and the characteristics of the occupational group. The available evidence is insufficient to establish a causal relationship or to generalize the findings to all relief groups. Therefore, further studies using objective indicators specific to the operational tasks of each group are needed. In addition, physical fitness assessment tests should be developed based on the actual requirements of operational missions.

Keywords: Physical fitness; Operational performance; Relief workers; Rescue and relief; Work capacity; Disaster responders.

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Introduction

Rescue and relief operations require physical and functional capabilities that are appropriate to the demands of the mission to ensure effective and safe performance. During operations, relief workers and disaster responders perform tasks such as carrying and transporting casualties, moving equipment, traversing difficult terrain, and undertaking strenuous physical activities under adverse environmental conditions. Depending on the type of mission and occupational group, these tasks

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