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Contribution ID: **332** Type: **1 - Scientific Poster**

Exercise intensity in modulating immune responses and clinical outcomes in cancer survivors: A scoping review

Thursday 23 July 2026 11:45 (20 minutes)

BACKGROUND: Exercise has emerged as a potent, non-pharmacological intervention to enhance immune function in patients with cancer. However, the effects of exercise are likely influenced by patients'oncologic characteristics, such as cancer treatment, and intervention variables, such as exercise intensity, which can lead to heterogeneous outcomes. This scoping review aimed to identify patterns, trends, and gaps in the literature regarding the relationship between exercise intensity and immune cell parameters in the context of treatment status.

METHODS: Reports were retrieved from PubMed, Medline, and Scopus. Eligible reports were controlled clinical trials that implemented an exercise training intervention with an objectively defined exercise intensity that reported a cellular immune outcome.

RESULTS: Twenty-one articles were included, comprising 15 randomized and 6 non-randomized controlled trials. Results suggest a potential effect of intensity, where vigorous-intensity exercise training more consistently elicited beneficial immunomodulation, specifically enhanced natural killer cell cytotoxicity and tumor infiltration. In contrast, light-to-moderate intensity exercise often resulted in no immunological changes, particularly for patients undergoing active treatment. Comparisons across studies were complicated by high heterogeneity in patient characteristics and intervention details. Furthermore, few studies reported oncologic outcomes, and none directly examined relationships between immune and clinical endpoints.

CONCLUSIONS: Current evidence suggests that vigorous exercise may be a promising strategy to bolster anti-tumor immunity. However, rigorously designed comparative trials with both clinical and immunological endpoints are required to definitively establish the role of exercise intensity in oncologic care.

Keywords

Exercise intensity; Immune function; Cancer outcomes; Scoping review

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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Session Classification: Poster Session