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Digital cancer prehabilitation to improve physical fitness: a scoping review and concept analysis

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Background
Cancer prehabilitation which aims to optimize physical fitness before treatment can enhance patient resilience. With increasing digitalization in healthcare, digital cancer prehabilitation has emerged as a promising approach to overcome accessibility and implementation barriers of traditional prehabilitation programs. However, the concept remains inconsistently defined across the literature.
Objective
To systematically map the existing literature and conduct a concept analysis to define and describe "digital cancer prehabilitation to improve physical fitness".
Methods
We conducted a scoping review combined with a concept analysis following the Walker and Avant framework. Four electronic databases (PubMed, Embase, CINAHL, and CENTRAL) were searched from inception to November 2025. Inclusion criteria were: adult patients awaiting cancer treatment, interventions aiming to improve one or more components of physical fitness, and the use of a digital health component. Data were synthesized to identify how the concept is used and to extract defining attributes, antecedents, consequences, and empirical referents.
Results
Fifty-seven papers were included, most of which were feasibility or pilot studies. Interventions targeted diverse cancer populations, most frequently lung and colorectal cancer, and used multiple exercise modalities, often combined with nutrition, lifestyle education, and psychological support. Digital components included activity coaching, activity tracking feedback, online resources, digital training sessions and virtual reality, usually in multicomponent programs. Three defining attributes were identified: personalized and adaptive interventions, integration of digital technologies and remote monitoring, and a proactive multimodal approach. Key antecedents were digital access and literacy, supportive clinical infrastructure, patient readiness, and social or motivational support. Reported consequences included improvements in physical and mental outcomes, improved clinical outcomes, and indications of improved scalability, accessibility, and cost-effectiveness.
Conclusion
Digital cancer prehabilitation to improve physical fitness is a proactive, digitally delivered, personalized multimodal intervention between diagnosis and treatment. The proposed definition and framework can guide development and implementation in clinical practice.

Keywords

Digital health, Physical fitness, Prehabilitation, Cancer patients

Conflict of Interest & Ethical Approval

yes

Abstract submitters declaration

yes

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