

# The Relationship Between Muscle Strength and Body Composition Measures and Cancer-Related Fatigue: A Systematic Review and Meta-Analysis

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**PROBLEM IDENTIFICATION:** Cancer-related fatigue (CRF) substantially affects daily living and quality of life, but objective CRF measures remain limited. This review aimed to identify the correlation between muscle strength and body composition measures and CRF, as well as potential objective indicators for assessing CRF.

**LITERATURE SEARCH:** PubMed®, MEDLINE®, CINAHL®/PsycINFO®, and Embase® were searched for studies published from January 2000 to January 2021.

**DATA EVALUATION:** Study selection and quality assessment were conducted using the Critical Appraisals Skills Programme checklist and the Strengthening the Reporting of Observational Studies in Epidemiology statement. Comprehensive Meta-Analysis software was used to perform meta-analysis.

**SYNTHESIS:** 25 studies were selected, and 19 measures were analyzed. CRF negatively correlated with hand grip strength, knee extensor strength, and the sit-to-stand test. No significant correlation was found between body composition measures and CRF.

**IMPLICATIONS FOR NURSING:** The evidence suggests that muscle strength measures may be potential indicators for CRF assessment. Combining objective and subjective CRF assessments could assist clinicians in evaluating the effectiveness of CRF interventions more accurately.

**KEYWORDS** cancer-related fatigue; muscle strength; body composition; meta-analysis

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Research has revealed that cancer-related fatigue (CRF) is one of the most frequently reported symptoms in patients with cancer and survivors (Agasi-Idenburg et al., 2017). According to a systematic review by Al Maqbali et al. (2021), the prevalence of CRF ranges from 11% to nearly 99%, depending on the patient's clinical status. CRF can be experienced before treatment onset and can increase during treatment with radiation therapy, chemotherapy, and hormonal and biologic therapies (Bower, 2014). CRF is also frequently associated with psychosocial factors, such as depression and anxiety (Yennurajalingam et al., 2016), and other cancer-related symptoms, such as chronic pain, insomnia, and nausea (Imayama et al., 2013). Compared with other symptoms, CRF is more distressing and often longer lasting, with a substantial impact on daily living and quality of life (Weis, 2011).

Proper assessment is the first step for managing CRF. However, fatigue lacks a widely accepted definition (Schvartsman et al., 2017; Veni et al., 2019). The limited consensus on fatigue has led to the development of a large number of different scales to measure CRF (Minton & Stone, 2009). Because fatigue instruments are primarily subjective in nature and most frequently measured using self-report scales (Finsterer & Mahjoub, 2014), attempts to evaluate CRF through objective measures remain limited (Veni et al., 2019). In addition, CRF may not always be sufficiently described and reported by patients using subjective scales and questionnaires (Canella et al., 2018; Finsterer & Mahjoub, 2014). Therefore, the use of perceptual, objective measures can help to evaluate fatigue more concretely (Platt et al., 2015).

The multifactorial etiology of CRF, such as cytokine dysregulation, hypothalamic-pituitary-adrenal