

## ARTICLES

# Conceptualizing and Measuring Physical Functioning in Cancer Survivorship Studies

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**Purpose/Objectives:** To propose a conceptual model to guide the design of intervention studies to improve physical functioning in cancer survivors.

**Data Sources:** Conceptualizations of physical functioning in people without cancer and exercise studies in breast cancer survivors.

**Data Synthesis:** Most exercise studies measured only one of three possible dimensions of physical functioning, and mediators seldom were tested.

**Conclusions:** Careful selection, naming, and measurement of physical functioning outcomes could maximize generation of new knowledge. More frequent testing of mediators could show how interventions affect physical functioning.

**Implications for Nursing:** Nurse scientists designing interventions to increase exercise, reduce symptoms, or manage side effects of treatment in cancer survivors are likely to measure physical functioning outcomes. Consistent measurement, terminology, and reporting of physical functioning outcomes in these studies will facilitate communication among nurse scientists and hasten translation of knowledge into clinical practice.

### Key Points . . .

- ▶ Consistent naming and measurement of physical functioning outcomes in intervention studies of cancer survivors are important.
- ▶ Physical functioning can be measured in three distinct dimensions: (a) performance tests of objective mobility, (b) self-reported perceived mobility, and (c) self-reported participation in life activities.
- ▶ Interventions may improve one or more physical functioning dimensions, depending on whether the intervention improves capacity or reduces demand.
- ▶ Valuable knowledge could be gained by more frequent testing of mediator effects in intervention studies to improve physical functioning in cancer survivors.

Many cancer survivors report declines in their physical functioning, including basic body mobility and engagement in work and leisure activities, during cancer treatment and immediately after (Hann et al., 1999; Kriegsman, Deeg, & Stalman, 2004; Kroenke et al., 2004; Nomori, Watanabe, Ohtsuka, Naruke, & Suemasu, 2004; Syrjala et al., 2004). For some survivors, post-treatment physical functioning eventually returns to pretreatment levels, though recovery of full participation in life activities after cancer treatment may take many years, especially when symptoms persist long-term (Curt et al., 2000; Flechtner & Bottomley, 2003). Across cancer diagnoses and types of treatment, many adult survivors report that they have not fully regained their precancer levels of physical functioning or engagement in social, work, or leisure activities (Ganz et al., 2003). Several causes of long-term decrements in physical functioning have been explored in prior research, including symptoms such as fatigue, pain, and sleep disturbance as well as psychological factors such as depression (Curt et al.; Dodd, Miaskowski, & Paul, 2001; Nail, 2001, 2002; Schwartz et al., 2000; Stone et al., 2000; Visser & Smets, 1998).

In previous studies of cancer survivors, the absence of a clear, consistent definition of physical functioning has created confusion in the way that physical functioning was measured and the results were interpreted. Physical functioning is a broad concept that includes physical abilities that range from simple mobility to engagement in complex activities that require adaptation to an environment. If the physical functioning outcome measured in a study is not carefully selected, an intervention may be deemed ineffective when it might have been effective on a different dimension of physical functioning.

Another difficulty in interpreting physical functioning outcomes in research studies arises from the plethora of outcome names used, such as functional status, physical functioning, functional recovery, functional limitations, disability, quality

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