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Differential effects of behavioral interventions with a graded physical activity component in patients suffering from Chronic Fatigue (Syndrome): An updated systematic review and meta-analysis

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HIGHLIGHTS

- Interventions including physical activity have beneficial effects on chronic fatigue.
- The number of trials is modest and there is heterogeneity between them.
- Type of setting and provider of treatment moderate fatigue severity effect sizes.
- Minimal direct contact interventions are promising.

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ABSTRACT

An updated systematic review and meta-analysis was conducted to (1) evaluate the effects of behavioral and psychological interventions containing a graded physical activity component upon fatigue severity, physical functioning, physical activity and psychological distress, and to (2) examine potential moderator effects of trial characteristics (type of control, setting, provider, length of treatment, psychological component, flexibility in physical activity, and minimal face to face patient–provider contact). Pertinent content of selected studies was extracted and rated on a scale of methodological quality. Sixteen randomized controlled trials ($N = 2004$) were included in the meta-analyses. Significant small to medium effect sizes (Hedge's $g = 0.25$ to $g = 0.66$) were found for all outcomes at post-treatment ($M = 5.2$ months) and follow-up ($M = 11.7$ months), with the exception of physical activity at post-treatment ($g = 0.11$). The largest effects were found for fatigue severity ($g = 0.61$ to $g = 0.66$). Subgroup analyses revealed that minimal contact interventions had additional beneficial effects upon fatigue ($g = 0.96$) and depression ($g = 0.85$). Interventions provided by psychologists-psychotherapists and interventions conducted in secondary–tertiary settings also resulted in more beneficial effects on fatigue. We found some indication of publication bias. The small number of studies and variability between them are limitations of this study. Future research should explore additional moderating effects in order to improve the effectiveness of interventions.

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1. Introduction

Chronic Fatigue (or Idiopathic Chronic Fatigue—ICF) is a condition characterized by the presence of new onset unexplained persistent fatigue (lasting for at least 6 months) that is not alleviated by rest, is debilitating and leads to significant functional impairment. Commonly, these patients experience additional rheumatologic and neuropsychiatric symptoms (Afari & Buchwald, 2003; Lehman, Lehman, Hemphill, Mandel, & Cooper, 2002). When at least four of these symptoms are present (i.e. unrefreshing sleep, lengthy malaise after exertion lasting for over 24 h, impaired memory or concentration, sore throat, tender cervical or axillary lymph nodes, muscle pain, multi-joint pain without swelling or redness and headaches of a new type or severity) it is diagnosed as Chronic Fatigue Syndrome (CFS; or Myalgic Encephalomyelitis—ME) according to the widely used Centres for Disease Control and Prevention (CDC) criteria (Fukuda et al., 1994). Another set of diagnostic criteria commonly used is the Oxford Criteria (Sharpe, 1991), which differs from the CDC criteria in that the Oxford Criteria requires mental fatigue to be present, but do not require the presence of additional somatic symptoms. A panel of experts has recently proposed a new international consensus criterion (Carruthers et al., 2011), which does not require the presence of fatigue for at least 6 months, but requires the presence of post-exertional malaise as well as the presence of at least three symptoms related to neurological impairments (e.g. headaches), three immune, genito-urinary symptoms and/or gastro-intestinal (e.g. nausea), and one symptom related to energy production/transport impairments (e.g. subnormal body temperature). In addition, diagnosis of CFS is exclusionary, i.e. thorough full medical history and examinations are first conducted to rule out other medical conditions that could explain the symptoms.

The prevalence of CFS/ME is reported to be in between 0.007% and 2.6% in general population samples, varying according to several factors such as the criteria used to diagnose CFS/ME (Ranjith, 2005). It is more common in younger adults and among women (Afari & Buchwald, 2003). In terms of prognosis, full recovery rates are low, but it is common for patients to experience an improvement in symptom severity (Cairns & Hotpof, 2005). CFS/ME has been associated with a high use of health care resources (McCrone, Darbishire, Ridsdale, & Seed, 2003; Sabes-Figuera et al., 2010). The functional impairment and inability to work commonly found in these patients represent an important socioeconomic burden (Fernandez et al., 2009; Sabes-Figuera et al., 2010).

1.1. Physical activity and chronic fatigue

Several studies emphasize the fact that lack of physical activity and prolonged physical inactivity (rest) can result in physical deconditioning as well as in other physiological and psychosocial consequences that may perpetuate fatigue and physical disability (Clark, Clark, & White, 2005; Fulcher & White, 2000; Nijs, Wallman, & Paul, 2011b). It has therefore been recommended that CFS/ME patients engage in physical activity/exercise instead of refraining from it (National Institute for Health and Clinical Excellence, 2007). Physical activity that is too vigorous can however perpetuate fatigue symptoms (Nijs, Paul, & Wallman, 2008; Nijs, Wallman, & Paul, 2011b). Patients' perceptions and expectations with respect to symptom exacerbation as a consequence of physical exertion can lead to fear of physical activity (Clark et al., 2005; Nijs et al., 2008; Prins, Van der Meer, & Bleijenberg, 2006) and explain the reduced levels of physical activity found in patients with chronic fatigue (Nijs et al., 2011a). Not surprisingly, it is common to find a “boom-and-bust pattern”