



Research

Several submaximal exercise tests are reliable, valid and acceptable in people with chronic pain, fibromyalgia or chronic fatigue: a systematic review

Julia Ratter^a, Lorenz Radlinger^b, Cees Lucas^c

^a Hospital Rivierland Tiel, The Netherlands; ^b Applied Research and Development Physiotherapy, Health Division, Bern University of Applied Sciences, Switzerland; ^c Department of Clinical Epidemiology, Biostatistics and Bioinformatics, Medical Faculty, University of Amsterdam, Academic Medical Centre, Amsterdam, The Netherlands

KEYWORDS

Chronic pain
Fatigue syndrome (chronic)
Fibromyalgia
Exercise test
Psychometrics
Review (publication type)



ABSTRACT

Question: Are submaximal and maximal exercise tests reliable, valid and acceptable in people with chronic pain, fibromyalgia and fatigue disorders? **Design:** Systematic review of studies of the psychometric properties of exercise tests. **Participants:** People older than 18 years with chronic pain, fibromyalgia and chronic fatigue disorders. **Intervention:** Studies of the measurement properties of tests of physical capacity in people with chronic pain, fibromyalgia or chronic fatigue disorders were included. **Outcome measures:** Studies were required to report: reliability coefficients (intraclass correlation coefficient, alpha reliability coefficient, limits of agreements and Bland-Altman plots); validity coefficients (intraclass correlation coefficient, Spearman's correlation, Kendall T coefficient, Pearson's correlation); or dropout rates. **Results:** Fourteen studies were eligible: none had low risk of bias, 10 had unclear risk of bias and four had high risk of bias. The included studies evaluated: Åstrand test; modified Åstrand test; Lean body mass-based Åstrand test; submaximal bicycle ergometer test following another protocol other than Åstrand test; 2-km walk test; 5-minute, 6-minute and 10-minute walk tests; shuttle walk test; and modified symptom-limited Bruce treadmill test. None of the studies assessed maximal exercise tests. Where they had been tested, reliability and validity were generally high. Dropout rates were generally acceptable. The 2-km walk test was not recommended in fibromyalgia. **Conclusion:** Moderate evidence was found for reliability, validity and acceptability of submaximal exercise tests in patients with chronic pain, fibromyalgia or chronic fatigue. There is no evidence about maximal exercise tests in patients with chronic pain, fibromyalgia and chronic fatigue. [Ratter J, Radlinger L, Lucas C (2014) Several submaximal exercise tests are reliable, valid and acceptable in people with chronic pain, fibromyalgia or chronic fatigue: a systematic review. *Journal of Physiotherapy* 60: 144–150]

© 2014 Published by Elsevier B.V. on behalf of Australian Physiotherapy Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

Introduction

Functional disorders are illnesses in which there is no obvious pathology or anatomical change in an organ, and there is a presumed dysfunction of an organ or system. Chronic pain, fibromyalgia and chronic fatigue disorders are often-mentioned diagnoses belonging to functional disorders.¹ Chronic pain is defined as pain that has lasted longer than 3 to 6 months,² although some use 12 months as the threshold.³ A popular alternative definition of chronic pain, involving no arbitrarily fixed durations is 'pain that extends beyond the expected period of healing'.² Fibromyalgia is a chronic functional illness that presents with widespread musculoskeletal pain, including above and below the waist, as well as the right and left sides of the body, and the physical finding of 11 of 18 tender points. These simple criteria provide 85% specificity and sensitivity in differentiating patients with fibromyalgia from those with other rheumatic diseases.⁴ Chronic fatigue is defined as persistent or relapsing fatigue lasting more than 6 months, with more than four of the following symptoms: impaired memory, sore throat, tender cervical or axillary lymph nodes, muscle pain, multifocal joint pain, new headaches, unrefreshing sleep, and post-exertion malaise.⁴

A challenging diagnostic dilemma with regard to the above diagnoses is overlap of symptoms. Chronic widespread pain, the cardinal symptom of fibromyalgia, is prevalent and co-occurs with numerous symptom-based conditions such as chronic fatigue syndrome, joint pain and psychiatric disorders.⁵ Estimates of the number of patients with fibromyalgia who meet the criteria for chronic fatigue disorders range from 30 to 70%.⁴ Fibromyalgia syndrome and chronic fatigue syndrome are similar in many ways – both conditions lack an accepted disease model that can explain signs and symptoms in terms of specific pathophysiological abnormalities.⁶

In Europe, 19% of adults experience chronic pain of moderate to severe intensity with serious negative implications for their social and working lives.⁷ Fatigue is also a common symptom in the community, affecting from 0.007 to 2.8% in the general adult population and from 0.006 to 3.0% in primary care.⁸ Fibromyalgia syndrome affects 2 to 4% of the general population, and over 5% of patients in general medical practice.⁹

Recent studies have confirmed previous evidence of the enormous indirect socioeconomic costs of chronic pain, fibromyalgia and chronic fatigue disorders. The overall financial costs of chronic pain to society are comparable with the costs of cancer or

cardiovascular diseases.^{10,11} Chronic pain is also associated with many secondary stressors such as sleep disruption, unemployment and interpersonal tensions.¹² Chronic fatigue syndrome is characterised by profound disabling fatigue lasting at least 6 months and accompanied by numerous symptoms such as pain, sleep difficulties and cognitive impairment.¹³ Chronic pain, fibromyalgia and chronic fatigue also have personal economic, psychological and social consequences for the affected individuals.^{12,14,15} One in three people with pain or fatigue disorders is unable or less able to maintain an independent lifestyle¹¹ and 50 to 66% of people suffering from chronic pain are less able or unable to exercise, enjoy normal sleep, perform household chores, attend social activities, drive a car, walk or have sexual relations.¹⁶

Although key risk factors have been identified, the incidence of chronic pain, fibromyalgia and fatigue disorders has been increasing, rendering their management a persistent challenge.¹⁴ Fear avoidance models emphasise psychological distress, pain-related anxiety, anxiety sensitivity, fear of illness/injury, fear of re-injury and catastrophising in the development and maintenance of disabling chronic pain.¹⁷ International and national guidelines recommend graded activity and graded exposure in the treatment of chronic disorders.^{15,18-21}

The validity of self-reported assessment of pain and physical disability is controversial. The level of pain reported by people with chronic pain is not always related to their reports of their physical disability. Nevertheless, pain, fear of pain and its consequences are subjective experiences and are difficult to assess.²² Observational measures may be useful to corroborate subjective reports when evaluating each person's capability.^{23,24} Ideally, evaluation of physical function in people with chronic pain and chronic fatigue disorders should rely on a combination of clinical assessment of impairments, behavioural observation of physical function, and self-report.²⁵ Despite this, there is limited evidence about the acceptability, reliability and validity of submaximal and maximal exercise tests measuring physical fitness and capacity in this group of people. To assess aerobic capacity, maximal testing with calorimetry is considered to be the gold standard.^{26,27} However, outcomes of this measurement are strongly influenced by motivation, fear and pain.²⁶ Furthermore, outcomes are invalid when fear and pain expectation rather than aerobic capacity limit performance.²⁸ In one study, over 90% of the variance in performance among disabled individuals with chronic musculoskeletal pain was predicted by psychosocial factors like self-efficacy, perceived emotional and physical functioning, pain intensity and pain cognition.²⁹ Several studies of people with chronic pain have identified discrepancies between self-report of physical activity and actual level of physical activity. Poorer achievement on physical performance testing by people with low back pain has been linked to fear of injury during movement, depression, cognitive factors, pain expectations, pain increase during testing, disability status and the presence of a solicitous spouse.²³

The conventional Åstrand bicycle test and maximal exercise capacity tests tend to be unacceptable in people with a very poor aerobic capacity³⁰ and the validity is low in those with chronic low back pain.²⁷ Also, physical assessments used to detect the degree of disability in other disease states have major limitations when applied to people with fibromyalgia and chronic fatigue syndrome.³¹

In the last decade, many submaximal tests have been developed as an alternative to maximal exercise testing.²⁸ The most commonly used test in people with chronic low back pain is the submaximal Åstrand bicycle test. Its test-retest reliability seems to be good in people with chronic low back pain.³² However, submaximal testing tends to underestimate or overestimate maximal oxygen consumption (VO₂max) in 15% of healthy subjects.³³ Nevertheless, due to pain, fatigue and fear of worsening their symptoms, people with chronic pain, fibromyalgia and fatigue disorders are often unable to perform the submaximal Åstrand bicycle test.^{34,35}

Guidance for clinicians in this area is needed because the variety in attributes of the available instruments makes it difficult

to select the best instrument. Therefore, the research question of this systematic review was:

In people with chronic pain, fibromyalgia and fatigue disorders, are maximal and submaximal physical capacity tests reliable, valid and acceptable?

Method

Identification and selection of trials

A sensitive search was performed in PubMed, Embase, PEDro and the Cochrane library in October 2012. The search strategy was developed by a medical librarian specialist. The detailed strategy for PubMed is presented in Appendix 1 (see eAddenda). Eligible studies could use any study design that reported on one or more measurement properties of physical capacity tests in adults with chronic pain, chronic fatigue disorders or fibromyalgia. Data were extracted for reliability coefficients, validity coefficients and dropout rates. Studies published in any language and in any year were eligible for inclusion.

Records retrieved by the search were assessed for eligibility by two reviewers (JR, LR) working independently, initially based on titles and abstracts, with potentially eligible articles being assessed in full-text to confirm eligibility. Discrepancies were reviewed and consensus was achieved by discussion. Reasons for exclusion were given for each reference and are documented in Figure 1. For each included study, the exercise tests assessed were tabulated along with the psychometric tests performed and their results.

Assessment of characteristics of trials

Quality

The COSMIN 4-point rating scale (excellent, good, fair, poor) was used to evaluate elements of the methodological quality

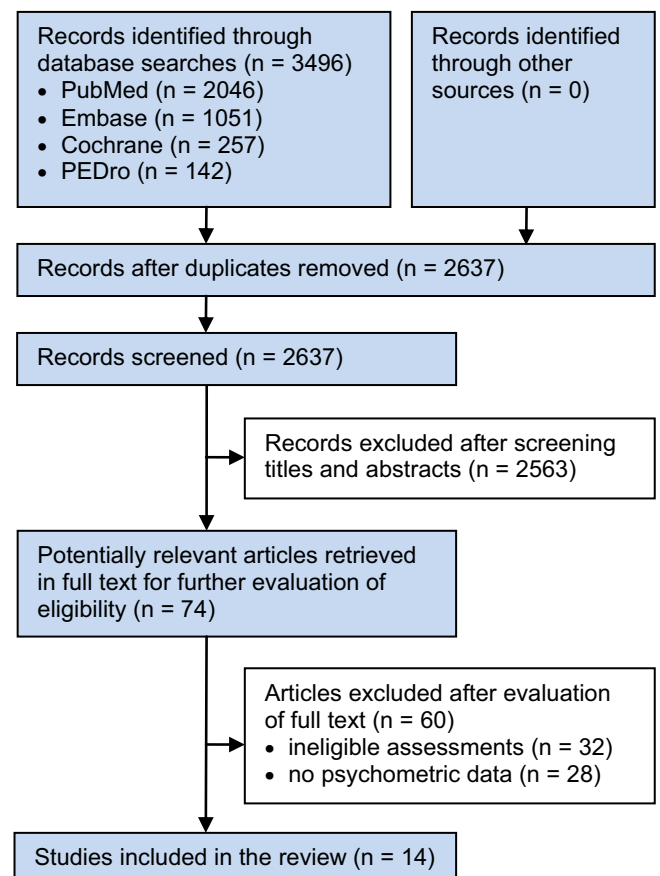


Figure 1. Flow of studies through the review.

Download English Version:

<https://daneshyari.com/en/article/5864065>

Download Persian Version:

<https://daneshyari.com/article/5864065>

[Daneshyari.com](https://daneshyari.com)