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Physiotherapy

Physiotherapy 100 (2014) 319–324

Patients with musculoskeletal conditions do less vigorous physical activity and have poorer physical fitness than population controls: a cross-sectional study

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Abstract

Objectives To compare physical activity and physical fitness in patients with various musculoskeletal conditions receiving physiotherapy in primary care with population controls.
Design Cross-sectional.
Participants One hundred and sixty-seven patients with musculoskeletal conditions receiving physiotherapy in primary care and 313 population controls from various settings and geographical areas.
Main outcome measures Physical activity was measured with the International Physical Activity Questionnaire short-form (IPAQ-sf) and reported in metabolic equivalents (METs). The 6-minute walk test and 30-second sit-to-stand test reflected cardiorespiratory endurance and muscular strength, respectively.
Results Differences in physical activity between the groups were explored using the Mann–Whitney *U*-test. The patient group reported significantly less vigorous activity compared with the control group {median 0 [interquartile range (IQR) 0 to 960] vs median 240 [IQR 0 to 1440] MET minutes/week, respectively)} ($P = 0.001$). A similar proportion of patients (68%) and controls (75%) reached the recommended level of health-enhancing physical activity ($P = 0.11$). Linear regression analyses adjusted for age, body mass index and gender showed significantly poorer fitness in the patient group compared with the control group, reflected by the 6-minute walk test and the 30-second sit-to-stand test {mean difference 69 m [95% confidence interval (CI) 52 to 85; $P \leq 0.001$] and six repetitions [95% CI 5 to 7; $P \leq 0.001$], respectively}.
Conclusions Patients with various long-term musculoskeletal conditions receiving physiotherapy in primary care had significantly poorer physical fitness and reported less vigorous physical activity compared with population controls.

Keywords: Musculoskeletal diseases; Physical fitness; Motor activity; Physical therapy modalities; Control groups; Primary health care

Introduction

The evidence of the health benefits from improved physical fitness is indisputable, and studies have shown that enhanced cardiorespiratory endurance and muscular strength are strongly associated with better general health [1]. Increased physical activity and improved physical fitness seem to reduce the development of lifestyle-related diseases, chronic diseases and certain musculoskeletal conditions [2]. For many common musculoskeletal conditions, physical activity also seems to reduce disease symptoms such as pain and impaired function [3]. Patients with specific musculoskeletal diagnoses such as rheumatic diseases, low back pain, and hip or knee osteoarthritis, who are treated in

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http://dx.doi.org/10.1016/j.physio.2013.11.005

hospitals, are shown to be more deconditioned and less physically active than healthy controls [4–7]. It is not clear if patients with various musculoskeletal conditions treated in primary care show the same trend. More knowledge about personal and disease-related factors of importance for physical activity and fitness is needed to offer optimal treatment for this heterogeneous patient group.

In order to limit negative health effects for the large group of patients with long-term musculoskeletal conditions, it is important to enhance the focus on physical activity and health-related physical fitness as part of physiotherapeutic interventions. Physical fitness and physical activity are two different, but related, concepts, and information from both is essential for clinical decision making for interventions aiming to increase physical fitness [8,9].

Clinical field tests for measuring physical performance have also been shown to be applicable for measuring physical fitness, such as cardiorespiratory endurance [i.e. 6-minute walk test (6MWT)] and muscular strength (i.e. 30-second sit-to-stand test) [8,10,11]. Further, clinical field tests are also time efficient and readily available, requiring portable or no equipment, and are therefore feasible for use in a busy clinical practice [12].

The purpose of this study was to compare the levels of physical activity and physical fitness (cardiorespiratory endurance and muscular strength) between patients with various musculoskeletal conditions receiving physiotherapy in primary care and population controls. The research questions were:

1. Do patients with musculoskeletal conditions receiving physiotherapy in primary care report similar levels of physical activity as population controls?
2. Are there any differences in physical fitness (cardiorespiratory endurance and muscular strength) between patients with musculoskeletal conditions receiving physiotherapy in primary care and population controls?

Methods

Design

The patient data in this cross-sectional study were collected from eight primary care physiotherapy clinics, situated in urban, suburban and rural areas of Norway. The control group was a convenience sample, so the participants were not selected specifically to match the patient group. Participants were recruited from different settings according to the predefined criteria described below.

The study was approved by the Norwegian Regional Committees for Medical and Health Research Ethics. All participants gave written informed consent before data collection commenced.

Participants

The patient group included individuals with various musculoskeletal conditions who were receiving physiotherapy from a primary care physiotherapist. Patients had to be over 18 years of age, be able to walk with or without the use of a walking aid, and be able to ascend and descend stairs. This study was part of a large programme for research in primary care physiotherapy (the FYSIOPRIM research programme [13]), and the inclusion criteria were set to fit several research questions covered in this programme. A sample size of 200 patients was calculated to allow for subgroup analysis.

The control group was a convenience sample of volunteers who were included in gender and age groups with 10-year increments (14 groups in total). The control group was not matched to the patient group; rather, the authors aimed to recruit a broad spectrum of participants with regard to geographical location (urban, suburban and rural areas), settings (workplaces, welfare service centres for elderly, universities) and age groups. The power calculation was based on the mean and standard deviation (SD) in each age group during the ongoing data collection, and the sample size was estimated to be 20 to 25 participants per group. With the exception of receiving physiotherapy, the same inclusion criteria were applied for the control group as for the patient group.

Background data

Background data collected from all participants were age, gender, work-related status, body weight and height. Body mass index (BMI) was calculated from body weight and height (kg/m^2). In addition, area-specific main problem and duration of complaints were collected from the patient group.

Outcome measures

Self-reported physical activity was measured using the International Physical Activity Questionnaire short form (IPAQ-sf) [14]. The questionnaire asks for information about time (hours or minutes per day and number of days per week) spent performing activities of vigorous and moderate intensity, and time spent walking and sitting.

Data obtained from the IPAQ-sf can be converted into metabolic equivalent (MET) scores, where 1 MET represents the body's resting energy expenditure (www.ipaq.ki.se). According to the IPAQ guidelines, vigorous-intensity physical activity was assumed to correspond to 8 METs, moderate-intensity physical activity was assumed to correspond to 4 METs, and walking was assumed to correspond to 3.3 METs. The MET scores were calculated by multiplying the number of minutes per day by the number of days per week by the MET value for walking, moderate or vigorous activity, making three distinct intensity categories. Total physical activity per week was calculated by summarising the MET scores from the three intensity categories. All the calculations and data cleaning were performed