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Systematic review

Activating therapy modalities in older individuals with chronic non-specific low back pain: a systematic review

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Abstract

Background Although there are many special exercise-based therapy approaches for the working population suffering chronic low back pain, similar programmes for older individuals are rare.
Objectives To summarise all evaluated physical therapy approaches, and assess the effects on older people with chronic low back pain.
Data sources Medline, CINAHL, Cochrane, Embase, PEDro, PsychINFO and Psyndex.
Study selection/eligibility Age ≥ 65 years, subacute or chronic non-specific low back pain of ≥6 weeks' duration, and a physical therapy approach.
Study appraisal and synthesis methods Study selection, data extraction, and assessment of methodological quality and clinical relevance were performed independently by two reviewers. As there were only a few controlled trials and wide heterogeneity in observation periods and outcome measures, pooling of data was not feasible. Therefore, the results are presented descriptively.
Results In total, nine studies were included; six related to mixed physiotherapy modalities, one related to strength training, and two related to endurance training. Low-quality evidence suggests that physical therapy modalities are associated with a small-to-moderate reduction in pain and a small improvement in function.
Limitations The results must be interpreted with caution due to poor methodological quality.
Conclusion and implications of key findings Few studies have been performed in this highly relevant and growing age group. It is not possible to recommend one particular modality or programme; as such, prescriptions should reflect patients' preferences and local conditions. Further research of higher methodological quality is needed urgently.

Keywords: Aged persons; Chronic low back pain; Exercise therapy

Introduction

Persistent pain is a major problem for many older individuals [1]. Back pain is a particularly common complaint among the elderly, and is often correlated with functional limitation and perceived difficulty in performing daily life activities. According to the Global Burden of Disease 2010 study, back pain ranked highest in terms of disability and sixth in terms of overall burden [2]. Comprehensive estimates on the prevalence of persistent back pain in the elderly are few due to differing pain definitions and survey methods, with 1-month prevalence rates for back pain and low back pain (LBP) between 18% and 29% and between 27% and 49%, respectively [3]. Cecchi *et al*. [4] reported a significant association between back pain and depressed mood and physical activity in older adults.

International guidelines for pain in the elderly recommend non-pharmacological solutions, favouring physical therapy approaches [5–7]. Although the effects of exercise-based therapy regimes are not fully understood [8,9], physical activity seems to increase functionality, which is also associated with quality of life in older individuals. A chapter in the International Association for the Study of Pain's (IASP) book on pain in older adults [10] underlines the importance

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of physical therapy regimes in older adults because these modalities are less toxic than pharmacological therapies, and can allow patients to maintain their functional independence.

Although there are many special exercise-based therapy approaches for middle-aged adults with LBP [11–14], similar programmes for the elderly seem scarce. These should consider older adults' special needs, barriers and available resources to help them maintain physical and social functioning, quality of life and autonomy in daily living.

The objectives of this review were to gain an overview of all evaluated physical therapy modalities, and to examine the effects of these exercise interventions on physical function and pain in adults aged ≥65 years.

Materials and methods

Data sources and search strategy

A systematic search of Medline (via PubMed), CINAHL, EMBASE, PEDro, PsycINFO, PSYNDEX and the Cochrane Database of Systematic Reviews was performed in May 2013. Additionally, reference lists of all included articles and relevant systematic reviews in the Cochrane Library were screened manually for supplemental literature.

Inclusion criteria were: age ≥ 65 years, subacute or chronic non-specific LBP of ≥6 weeks' duration, an activating physical therapy approach, and at least one outcome measure regarding function/disability or pain. Exclusion criteria were case studies, acute or specific LBP, and non-active therapies such as passive modalities or invasive/operative techniques alone. No further restrictions regarding study type or publication date were applied, as a narrow field of research was anticipated. For practical reasons, the authors only searched for studies published in English or German.

The search strategies to identify all relevant published articles on the subject combined terms for back pain, terms for several therapy modalities, and terms for aged persons. The full search strategy for PubMed can be found in Appendix A (see online supplementary material).

Study selection and data extraction

Study selection, data extraction, and assessment of methodological quality and clinical relevance were performed on the basis of prespecified checklists by two independent reviewers (CL, KK). Discrepancies were resolved by consensus or by a third reviewer (AB) if necessary.

Initially, the title and abstract of all identified studies were screened. The full text of potentially eligible articles was analysed against the inclusion and exclusion criteria. Studies were included if they met the target population, measured function/disability and/or pain, and included at least one active therapy group. An 'activating therapy approach' was defined as a physical therapy modality or exercise, either alone or in conjunction with psychological intervention. The physical therapy modalities had to be intended as treatment for LBP and had to comprise at least 50% of the training scheme. Exercise was defined following the review by Hayden *et al.* [11] as 'a series of specific movements with the aim of training or developing the body by a routine practice or as physical training to promote good physical health' [15].

Data extraction included study characteristics, participant characteristics, interventions, and key results focusing on function/disability and pain.

Methodological quality assessment

All studies were assessed independently by two reviewers (CL, KK) for methodological quality. To assess the potential sources of bias that were most relevant to the particular objectives of the study, a scale was created based on the most relevant and common items of the CONSORT, TREND and STROBE statements [16–18]. As this scale has not been validated, the transparency of reporting using the CONSORT statement for randomised controlled trials [16] and the STROBE statement for observational studies [18,19] was also appraised. Validity, potential risk of bias and the relevance of included studies were considered with the aid of these checklists.

Results

Study selection

Of the 2577 articles identified, nine articles were included in this systematic review (Fig. A, see online supplementary material). These included three randomised controlled trials [20–22] and six observational studies [23–28]. Articles were excluded for one or more of the following reasons: invalid patient age (112), no activating therapy (10), specific LBP instead of non-specific (7), no intervention study (3), only study protocol published [29,30] and review withdrawn [31]. For one included study [20], information from a published secondary data analysis [32] is available.

Characteristics of included studies

Three types of therapy modalities could be identified (Table 1). Most studies ($n = 6$) applied mixed physiotherapy modalities, with a mixture of methods such as strengthening, endurance training, balance training and flexibility exercises [20,22–24,27,28]. Two studies reported endurance training [21,26], and one study reported strength training [25]. Studies were performed in the USA ($n = 7$), Germany ($n = 1$) and Italy ($n = 1$).

Most studies only reported pre–post therapy effects, and four studies reported follow-up data ranging from 3 months to 2 years (Beissner *et al.*, 3 months; Basler *et al.*, 6 months; Weiner *et al.*, 6 months; Mailloux *et al.*, 2 years) [20,22,23,28].