

LITERATURE REVIEW

EXERCISE THERAPY FOR OFFICE WORKERS WITH NONSPECIFIC NECK PAIN: A SYSTEMATIC REVIEW

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ABSTRACT

Objective: The purpose of this study was to evaluate the effectiveness of various types of exercise for prevention and cure of nonspecific neck pain in office workers.

Methods: Publications between 1980 and April 2010 were systematically searched in various databases (PubMed, CINAHL Plus with full text, The Cochrane Library, Science Direct, PEDro, ProQuest, PsycNet, and Scopus). The following key words were used: *neck pain, cervical pain, exercise, strengthening, stretching, endurance, office workers, visual display unit, visual display terminal, and computer users*. A hand search of relevant journals was also carried out. Relevant randomized controlled trials were retrieved and assessed for methodological quality by 2 independent reviewers. The strength of the evidence was based on methodological quality and consistency of the results.

Results: Nine randomized controlled trials were included in this review, of which 6 were rated as high-quality studies. No exercise type was identified as being effective in the prevention of nonspecific neck pain in office workers. Strong evidence was found for the effectiveness of muscle strengthening and endurance exercises in treating neck pain. Moderate evidence supported the use of muscle endurance exercise in reducing disability attributed to neck pain.

Conclusion: Literature investigating the efficacy of exercise in office workers with nonspecific neck pain was heterogeneous. Within the limitations, for treatment of neck pain, either muscle strengthening or endurance exercise is recommended, whereas for reduction of pain-related disability, muscle endurance exercise is suggested. Further research is needed before any firm conclusions regarding the most effective exercise programs for office workers can be reached. (*J Manipulative Physiol Ther* 2011;34:62-71)

Key Indexing Terms: *Review; Systematic; Exercise Therapy; Neck Pain; Computers*

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Neck pain is very common among office workers. Approximately 43% to 69% of office workers experienced neck pain in the preceding 12 months,¹⁻³ and the 1-year incidence rate for neck pain is about 34% to 49%.⁴⁻⁶ Neck pain causes considerable personal suffering due to pain, disability, and impaired quality of work and life in general, which can be a great socioeconomic burden on both patients and society.⁷⁻¹⁰

Nonspecific neck pain is neck pain (with or without radiation) without any specific systematic disease being detected as the underlying cause of the complaints.¹¹ Numerous structures in the neck and nearby regions may be the sources of nonspecific neck pain, such as muscles, joint structures, ligaments, intervertebral disks, and neural structures. Much attention has been paid to the evaluation of the effectiveness of various interventions aiming to prevent or alleviate nonspecific neck pain.^{12,13} Exercise therapy has been found to be beneficial for nonspecific neck pain.¹⁴⁻¹⁶

Sarig-Bahat¹⁶ systematically reviewed 16 randomized controlled trials (RCTs) and found strong evidence supporting the effectiveness of proprioceptive exercises and dynamic-resisted strengthening exercises of the neck-shoulder muscles for chronic or frequent neck disorders. Linton and van Tulder¹⁴ systematically reviewed 27 controlled trials and revealed sufficient evidence indicating that exercise therapy effectively prevents neck pain in the general population.

Nonspecific neck pain in different occupations is unlikely to originate from identical causes because patients are exposed to different risk factors. Therefore, implementing the same exercise regimen for everyone with neck pain would be irrational. Office work usually involves working for long hours on a computer. Evidence suggests that computer and computer mouse use can cause tension neck syndrome, which is the most common diagnosis in the neck region among computer users.¹⁷ To date, it remains unclear which type of exercise is appropriate for office workers.

Thus, the aim of this article was to systematically review the literature to gain insights into which types of exercise are effective for the prevention and cure of nonspecific neck pain in office workers as well as assess the strength of evidence. In this study, prevention was interpreted as the prevention of nonspecific neck pain among a population that does not currently have neck pain and has been pain-free in the previous months.¹⁸ Cure was interpreted as the treatment of and disability reduction in people who have nonspecific neck pain.

METHODS

Search Strategy

Publications between 1980 and April 2010 were retrieved by a computerized search of the following databases: PubMed, CINAHL Plus with full text, The Cochrane Library, Science Direct, PEDro, ProQuest, PsycNet, and Scopus. The following key words were used: *neck pain, cervical pain, exercise, strengthening, stretching, endurance, office workers, visual display unit, visual display terminal, and computer users*. After the inclusion of the articles based on the selection criteria, references were searched for additional articles.

Study Selection

Two independent reviewers (RS and ES) selected relevant articles from the articles retrieved using the search strategy. The selection criteria were as follows:

1. The study design was an RCT that used one or more types of exercise as a primary intervention.
2. The article was a full report published in English. Letters, abstracts, books, conference proceedings, and posters were excluded.

3. Study samples were office workers, visual display unit/terminal operators, or computer users.
4. Nonspecific neck pain was included in the study. Studies on neck pain due to serious spinal pathology (eg, tumor, fracture, dislocation, or infection), systemic disease, or other specific causes were excluded.

Methodological Quality Assessment

The articles were evaluated for methodological quality by 2 reviewers (RS and ES) using the PEDro scale, which contains 11 yes/no items.¹⁹ A PEDro score was calculated by adding up all the “yes” answers from items 2 to 11. The first item was not used to calculate the PEDro score because it evaluates the external validity of trial results. A *high-quality study* was defined as scoring positive in at least 50% (5/10) of the items, and a *low-quality study* was defined as scoring positive in less than 50% of the items. When a trial had already been rated according to the PEDro scale and its score confirmed on the Physiotherapy Evidence Database (www.pedro.org.au), this score was used in the present study.²⁰

Data Extraction

Two reviewers (RS and ES) independently extracted the data using a standardized form, including characteristics of participants, intervention parameters, outcomes, and results. The consensus method was used to resolve disagreements between the 2 reviewers. A third reviewer (PJ) was consulted to achieve a final judgment if disagreements persisted.

Analysis

Clinical homogeneity was assessed by examining the study population, type of exercise, and follow-up periods in each trial. The results were pooled only if the studies were considered homogeneous. If not, the results were drawn using a rating system according to levels of evidence.

For each study, the effectiveness of exercise therapy was concluded based on the reported outcomes: the incidence and prevalence of neck pain, discomfort, pressure pain threshold, frequency, duration and severity of pain, productivity, work ability index, sick leave, recovery, and disability. Musculoskeletal discomfort was included in the study because evidence suggested that musculoskeletal discomfort together with insufficient recovery may lead to development of musculoskeletal pain.^{21,22} Any finding was classified as *positive* if an exercise program was demonstrated to be statistically more effective than a control group in at least one key outcome. Any finding was classified as *negative* if an exercise program was demonstrated to be statistically less effective than a control group in at least one key outcome. A

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