

Both endurance training and strength training reduced disability and pain in chronic nonspecific neck pain in women

Ylinen J, Takala EP, Nykänen M, et al. Active neck muscle training in the treatment of chronic neck pain in women: a randomized controlled trial. *JAMA*. 2003;289:2509-16.

QUESTION

In women with chronic nonspecific neck pain, does intensive isometric neck strength training or lighter endurance training of neck muscles reduce pain and disability?

DESIGN

Randomized {allocation concealed*}†, blinded {data collectors, outcome assessors, data analysts, data safety and monitoring committee, and manuscript writers}†, * controlled trial with 1-year follow-up.

SETTING

Occupational health care services in Finland.

PATIENTS

180 female office workers 25 to 53 years of age (mean age 46 y) who were permanent employees, had constant or frequently occurring neck pain for > 6 months, and were motivated to continue working and receive rehabilitation. Exclusion criteria included severe disorders of the cervical spine, frequent migraine, peripheral nerve entrapment, fibromyalgia, shoulder diseases, and inflammatory rheumatic diseases. Follow-up was 98% at 1 year.

INTERVENTION

Women were allocated to 1 of 3 groups: strength training ($n = 60$), endurance training ($n = 60$), and control ($n = 60$). Training

regimens consisted of 5 weekly 45-minute sessions for 12 days, with instructions for continuing the exercises at home. The strength group used an elastic band to do high-intensity, isometric neck-strengthening and stabilization exercises. The endurance group exercised the neck flexor muscles by lifting the head from supine and prone positions. Both groups used dumbbells to do dynamic exercises for the shoulders and upper arms and ended the session with 20 minutes of stretching. The control group spent 3 days every 2 months at the rehabilitation center doing recreational activities. All 3 groups were instructed to do 30 minutes of aerobic exercise 3 times a week.

MAIN OUTCOME MEASURES

Neck pain and disability (visual analogue [VAS] scale, modified neck and shoulder pain and disability index, Vernon neck disability index, and 6-point scale [1 = much more pain, 6 = complete relief from pain]).

MAIN RESULTS

Analysis was by intention to treat. Each training group had greater improvement on the VAS scale, neck and shoulder pain and disability index, and the Vernon disability index than did the control group. More patients in each training group than in the control group had complete pain relief (Table).

CONCLUSION

In women with chronic nonspecific neck pain, both intensive isometric neck strength training and lighter endurance training of neck muscles reduced disability and pain.

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*See Glossary.

†Information provided by author.

Strength or endurance training vs no training in women with chronic neck pain at 1 year†

Outcome	Comparisons	Event rates	RBI (95% CI)	NNT (CI)
Complete pain relief	Strength vs control	73% vs 20%	261% (120 to 521)	2 (2 to 3)
	Endurance vs control	59% vs 20%	188% (71 to 405)	3 (2 to 5)

†Abbreviations defined in Glossary; RBI, NNT, and CI calculated from data in article.

COMMENTARY

The study by Ylinen and colleagues had a sound design, was well executed, and had near-perfect follow-up. The 2 exercise groups improved more than the control group on most outcome measures. It is important to note that both exercise groups also had a multimodal rehabilitation program, which included relaxation and ergonomics training, behavioral support to reduce fear of pain and increase motivation to exercise, and 4 sessions of physical therapy (massage and mobilization) for pain relief. The control group had none of these. Hence, a more accurate title for this review and the article itself would be "Multimodal rehabilitation program reduced disability and pain in chronic nonspecific neck pain."

The authors comment that these programs, without ongoing home exercises, have shown only short-term responses in the previous studies. Hence, they attribute the durable responses in this study to the home exercises. This may be the case, but a study design where home exercise is the only difference between groups is required for this conclusion.

An interesting difference, which may be attributed to the type of exercise, appears between the 2 exercise groups: The strength group had

greater increases in neck strength and rotation range than did the endurance group, but relief of pain and strength were similar.

When applying the results to clinical practice, readers should note closely the many exclusion criteria and the enviable rates of compliance with the strength and endurance exercises throughout the follow-up year. According to participants' diaries, this averaged 2 of the recommended 3 times per week. Such good compliance may have been motivated by trial staff or the exercise diaries themselves or may have been inflated by the participants' desire to please the investigators on paper. Nonetheless, this high compliance marks this study as one of efficacy in optimal conditions rather than effectiveness in usual practice. Even if such good compliance with exercise could be achieved in clinical practice, gaining access to such an intensive and efficacious program may be challenging in many countries.

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