



Commentary

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The placebo effect revisited - author response

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The placebo effect revisited – author response

by Lars L Andersen PhD¹

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Our randomized controlled trial showed a reduction of neck/shoulder pain and headache in response to 10 weeks of resistance training performed for 2 minutes a day (1, 2). We used a pragmatic approach and did not investigate the mechanism of pain reduction.

It is well known that placebo can influence subjective outcomes. In the original article outlining the primary outcomes, we briefly discussed this: “Because blinding of participants in training studies is not possible, we cannot exclude the influence of placebo effects. However, the effect-size of changes in our study exceeds those previously reported in response to placebo” (2, p444). We mentioned that the effect size in our study (~0.5) exceeded those typically observed for placebo, with reference to a Cochrane Review for all clinical conditions (placebo effect size ~0.3) (3). Obviously this does not exclude that placebo effects influenced our findings. In their commentary, “The placebo effect revisited”, Andersen & Mikkelsen (4) referenced a meta-analysis on osteoarthritis (OA) showing effects sizes >0.5 for placebo. Our participants did not suffer from OA, but were generally healthy office workers with frequent neck/shoulder pain.

In our study, we had three intervention groups: (i) 2 minutes of daily resistance training, (ii) 12 minutes of daily resistance training, (iii) weekly information on different health-related aspects (control group). Because blinding is not possible in behavioral interventions and to avoid different outcome expectations between groups, we explained to the participants prior to randomization that none of the three interventions was known to be superior to the others. Of course, this does not guarantee that the three groups had similar outcome expectations. In hindsight, specific questions

about outcome expectations – as suggested by Andersen & Mikkelsen (4) – could have provided additional valuable information.

Due to the possible influence of placebo, studies investigating the effect of behavioral interventions on pain conditions should include outcomes other than subjective pain only. For this reason, we also included a manual palpation test on muscle tenderness performed by a physical therapist and a muscle strength test performed by an exercise physiologist. During these tests, the examiners remained blinded to group allocation. These tests showed a decrease in muscle tenderness and an increase in muscle strength at 10-week follow-up in the 2- and 12-minute groups compared with the control group (2), indicating that mechanisms beside placebo influenced our findings.

Andersen & Mikkelsen (4) state in their commentary that biological effects of such brief training bouts are not plausible. In our study, the 2-minute group performed a single set of resistance exercise with as many repetitions as they could (ie, until momentary muscular fatigue). Electrophysiological measurements show that this results in marked acute neuromuscular changes (5). Several research groups have documented physiological adaptations – both neural and muscular – in response to training interventions using single-set resistance exercise for different muscle groups among healthy volunteers (6). Thus, based on the literature, it is plausible that physiological changes can occur in response to brief resistance exercises bouts. Whether such changes are causally related to pain reduction is unknown. Hopefully, our study will prompt future research on the mechanisms of pain reduction in response to brief resistance exercise bouts.

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