

## Appraisal

## Critically appraised paper: A self-directed, web-based exercise and physical activity program supported with text messages improves knee pain and function for people with knee osteoarthritis

## Synopsis

Summary of: Nelligan RK, Hinman RS, Kasza J, Crofts SJC, Bennell KL. Effects of a self-directed web-based strengthening exercise and physical activity program supported by automated text messages for people with knee osteoarthritis: a randomized clinical trial. *JAMA Intern Med.* 2021;181(6):776–785.

**Question:** Does a web-based, self-directed exercise regime and physical activity intervention supported by automated text messages improve knee pain and function in people with knee osteoarthritis? **Design:** Randomised controlled trial with concealed allocation with limited disclosure to blind participants, as all outcome assessments were patient reported. **Setting:** Online recruitment of participants from the community throughout Australia. **Participants:** Inclusion criteria were age  $\geq 45$  years; clinical criteria for osteoarthritis; knee pain on most days for  $\geq 3$  months, with average overall knee pain  $\geq 4$  on an 11-point numeric rating scale in the previous week; and a mobile phone with text messaging capabilities and home internet access. Key exclusion criteria were scheduled joint replacement surgery, inflammatory arthritis or inability to speak English. Randomisation of 206 participants allocated 103 to an experimental group and 103 to a control group. **Interventions:** Both groups received access to a website containing information on knee pain, knee osteoarthritis and generic information on the importance of exercise and physical activity. In addition, the experimental group had access to a 24-week self-directed strengthening regimen and physical activity program on the website, supported by automated text messages. **Outcome measures:** The primary outcomes were improvement in knee

pain (average knee pain in the last week, scores 0 to 10 on numeric rating scale) and physical function (subscale of the Western Ontario and McMaster Universities Osteoarthritis Index, scores 0 to 68) from baseline to the end of the 24-week trial. Secondary outcomes were an additional pain measure, function in sport/recreation, quality of life, physical activity, self-efficacy, and satisfaction measured using appropriate standardised assessment tools. **Results:** 180 participants completed the study. At the end of the 24-week period the experimental group had greater improvements in overall pain ratings than the control group by 1.6 units (95% CI 0.9 to 2.2). Physical function improved more in the experimental than the control group by 5.2 units (95% CI 1.9 to 8.5). The groups differed for most secondary outcomes in favour of the experimental group, except for physical activity and self-efficacy for function and exercise, where there were no between-group differences. **Conclusion:** A free-access digital intervention involving a self-directed, web-based exercise and physical activity program supported by text messages improved knee pain and function in people with knee osteoarthritis.

**Provenance:** Invited. Not peer reviewed.

Alicia Spittle

Department of Physiotherapy, University of Melbourne, Australia

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## Commentary

There are a number of factors behind the underutilisation of first-line care in knee osteoarthritis (ie, exercise and education); one important factor is participation costs and lack of support.<sup>1</sup> This randomised controlled trial assessed an intervention of online structured exercise and physical activity guidance along with text messaging support strategies, which were based on the behaviour change wheel framework, to address typical barriers to exercise and physical activity. Compared with a control group that received online education and general advice about exercise and physical activity with osteoarthritis, the addition of this intervention resulted in greater relief in knee pain and improvements in physical function and quality of life after 6 months.

Mean between-group differences in pain, function and quality of life were in the proximity of minimum clinically important differences.<sup>2,3</sup> A total of 57% of participants in the intervention group compared with 27% in the control group improved overall, scoring better or much better on perceived effect after 6 months.

These findings suggest that a multicomponent approach is more effective than a unidimensional approach for online interventions in facilitating exercise and physical activity behaviour in people with osteoarthritis.<sup>4–7</sup> This intervention is easily scalable, unsupervised and free, and has the potential to be implemented at a population level. However, as online interventions seem to attract healthier people with

higher education,<sup>6–8</sup> further work is also needed to find ways to reach those in most need of first-line osteoarthritis care.

**Provenance:** Invited. Not peer reviewed.

Pætur Mikal Holm

Research unit PROgrez

Department of Physiotherapy and Occupational Therapy

Næstved-Slagelse-Ringsted Hospitals

Region Zealand, Denmark

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