

Effect of physical activity and dietary restriction interventions on the musculoskeletal function of overweight and obese elders with knee osteoarthritis: A systematic review

Authors:

Asma Alrushud, Alison Rushton, Archontissa Kanavaki, Carolyn Greig
School of Sport, Exercise and Rehabilitation Sciences, College of Life and Environmental Sciences, UoB.

Abstract:

Background Knee OA is the most common form of arthritis. The incidence of knee OA is increasing, due to increasing age and changes in body composition within the population, (age and obesity being key risk factors for the development of this condition [1,2]. The consequences are chronic pain, functional limitation and emotional distress which lead to disability and negatively affect quality of life [2]. Since knee OA is progressive, therapies rely on patient education, self-management, pain reduction, weight reduction, physical activity enhancement and improvement in function and quality of life [3,4,5]. A preliminary scoping study identified both diet and exercise interventions as practical strategies to reduce weight and decrease joint inflammation [2,6]. However there is no systematic review to date investigating the effectiveness of combining these interventions on the musculoskeletal function of overweight and obese elders with knee osteoarthritis. Consequently, identifying the most effective type and amount of diet as well as the most suitable exercise may help health care practitioners.

Objective to investigate the effectiveness of combined physical activity and dietary restriction programmes on the musculoskeletal function of overweight and obese elders with knee OA.

Design systematic review. The study protocol followed the Cochrane handbook method guidelines for a systematic review and PRISMA statement.

Information sources key electronic databases (Ovid, Embase, Web of science and CINAHL) were searched by 2 independent researchers. Eligibility of included studies was independently assessed by two reviewers, plus 3rd reviewer in the case of disagreement. Eligibility criteria for included studies randomized control trials published in English prior to 13 February 2015. The included participants were overweight and obese elders with BMI $\geq 25\text{Kg/m}^2$, aged ≥ 55 year and with radiographic evidence of unilateral or bilateral knee OA. Animal studies and reports not written in English were excluded. The interventions included physical activity plus dietary restriction programmes and their effect on the musculoskeletal function of overweight and obese elders with knee OA. Usual care either intervention or non intervention was the comparator in this

systematic review. Included outcome measures assessed musculoskeletal function (mobility, balance, walking speed), pain and quality of life.

Results:

50 studies were identified from the searches. Following review of title and abstract and full text 17 trials were included. Risk of bias evaluation, data extraction and synthesis of results are currently underway.

References:

- 1- Cooper, C., Snow, S., McAlindon, T. E., Kellingray, S., Stuart, B., Coggon, D., & Dieppe, P. A. (2000). Risk factors for the incidence and progression of radiographic knee osteoarthritis. *Arthritis & Rheumatism*, 43(5), 995-1000.
- 2- Messier, S. P., Mihalko, S. L., Legault, C., Miller, G. D., Nicklas, B. J., DeVita, P., & Loeser, R. F. (2013). Effects of intensive diet and exercise on knee joint loads, inflammation, and clinical outcomes among overweight and obese adults with knee osteoarthritis: the IDEA randomized clinical trial. *JAMA*, 310(12), 1263-1273.
- 3- Abbott, J. H., Robertson, M. C., Chapple, C., Pinto, D., Wright, A. A., de la Barra, S. L., & MOA Trial team. (2013). Manual therapy, exercise therapy, or both, in addition to usual care, for osteoarthritis of the hip or knee: a randomized controlled trial. 1: clinical effectiveness. *Osteoarthritis and Cartilage*, 21(4), 525-534.
- 4- McAlindon, T. E., Bannuru, R. R., Sullivan, M. C., Arden, N. K., Berenbaum, F., Bierma-Zeinstra, S. M. & Underwood, M. (2014). OARSI guidelines for the non-surgical management of knee osteoarthritis. *Osteoarthritis and Cartilage*, 22(3), 363-388.
- 5- Imamura, M., Imamura, S. T., Kaziyama, H. H., Targino, R. A., Hsing, W. T., De Souza, L. P. M., & Camanho, G. L. (2008). Impact of nervous system hyperalgesia on pain, disability, and quality of life in patients with knee osteoarthritis: a controlled analysis. *Arthritis Care & Research*, 59(10), 1424-1431.
- 6- Wu, T., Gao, X., Chen, M., & Van Dam, R. M. (2009). Long-term effectiveness of diet-plus-exercise interventions vs. diet-only interventions for weight loss: a meta-analysis. *Obesity Reviews*, 10(3), 313-323.

Acknowledgment:

The authors would like to acknowledge King Saud University, Saudi Arabia and the Saudi Arabian Cultural Bureau (AA) and the Centre for Musculoskeletal Ageing Research (AK, AR, CAG).



UNIVERSITY OF BIRMINGHAM

Institute of Inflammation and Ageing
College of Medical & Dental Sciences
Birmingham University Research Labs
Queen Elizabeth Hospital
Mindelsohn Way, Edgbaston,
Birmingham,
B15 2WB

Date 23/05/2016

To whom it may concern,

I can confirm that Asma Alrushud attended the Centre for Musculoskeletal Ageing Research (CMAR) Conference from the 15th to the 17th of March 2015 in Nottingham and presented a poster titled "*Effect of physical activity and dietary restriction interventions on the musculoskeletal function of overweight and obese elders with knee osteoarthritis: A systematic review*"

Yours sincerely

A handwritten signature in black ink, appearing to read 'Janet M Lord'.

Professor Janet M Lord BSc PhD