
Effectiveness of dietary interventions among adults of retirement age: a systematic review and meta-analysis of randomized controlled trials

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CRD summary

The authors concluded that dietary interventions delivered during the retirement transition were effective, sustainable in the longer term and likely to be of public health significance. There were concerns about high heterogeneity and the fact that outcomes were self-reported. Despite this, the conclusions reflected the evidence appear likely to be reliable.

Authors' objectives

To assess the effectiveness of dietary interventions that promote a health dietary pattern, such as the Mediterranean diet or any of its component food groups, among adults of retirement age and to identify characteristics of effective interventions.

Searching

Twelve electronic databases including MEDLINE and EMBASE were searched from inception to April 2013 for studies published in English. Search terms were reported. Reference lists of identified studies and previously published related systematic reviews were hand searched.

Study selection

Randomised controlled trials (RCTs), including cluster-RCTs, that evaluated the promotion of a healthy dietary pattern or its constituent food groups (increased fruit and vegetables; legumes or pulses; nuts and seeds; unrefined cereals; olive oil; fish; moderate consumption of wine; low consumption of meat and meat products) in adults with a mean/median age of between 54 to 70 years were eligible for inclusion. Only studies conducted in developed countries were included. Studies that involved non-institutionalised adults with or without health risk factors were included. Studies that investigated lifestyle interventions such as physical activity were included so long as effects of the diet component were reported independently. Only interventions with a follow-up of more than three months were eligible. Studies that promoted other dietary patterns, laboratory feeding trials, studies on change in a specific macro/micro nutrient, studies that promoted prefabricated diet foods or meal replacement drinks and studies that tested dietary supplements were excluded. The primary outcome of interest was dietary behaviour change (defined in the review).

Studies were conducted in Europe and North America. Mean ages ranged from 54 to 67 years. Most participants were overweight and obese. Most studies used food frequency questionnaires (FFQ) or fruit and vegetables screener questionnaires to assess self-reported food intake. Interventions included promoting a Mediterranean diet, plant-based diet, dietary pattern intended to decrease fat intake and consumption of fruit and vegetables. Treatment delivery, intensity and setting and people who provided the treatments varied between studies.

Two reviewers independently selected studies for inclusion. Discrepancies between reviewers were resolved through discussion with a third reviewer.

Assessment of study quality

Study quality was assessed using the Cochrane risk of bias tool. Two reviewers were involved in quality assessment.

Data extraction

Data were extracted to calculate mean differences (MD) and 95% confidence intervals (CI). Outcomes reported as number of portions/servings were converted into grams. Two reviewers were involved in data extraction.

Methods of synthesis

Pooled mean differences and 95% confidence intervals were calculated using a random-effects model. Statistical heterogeneity was evaluated using the I^2 statistic ($I^2 > 50\%$ was considered to be evidence of high heterogeneity). Subgroup analysis (reported in the review) and meta-regression were used to assess sources of heterogeneity and to investigate the impact of a range of variables (such as intervention characteristics and length of follow-up) on estimates

of effect. Publication bias was assessed using funnel plot and Egger's test.

Results of the review

Twenty-four studies were included in the review (63,189 participants). Follow-up varied from four to 58 months. The authors reported that studies were generally of good quality with low attrition rates.

Meta-analysis revealed that interventions increased fruit and vegetables intake (MD 87.5 g/day, 95% CI 65.3 to 109.6; $I^2=96%$; 22 studies) and this was sustained in the longer term (>12 months). The results did not alter when stratified by type of interventions or BMI (body mass index). Interventions produced slightly higher intakes of fruit (MD 54.0 g/day, 95% CI 27.3 to 80.8; $I^2=98%$; 14 studies) than of vegetables (MD 44.6 g/day, 95% CI 28.5 to 60.8; $I^2=95%$; 14 studies). Modest but significant increases in fish intake (MD 6.59 g/day, 95% CI 0.5 to 12.7; $I^2=93%$; three studies) and decreases in meat intake (MD -8.74 g/day, 95% CI -11 to -6.5; $I^2=92%$; five studies) were observed. There was a statistically significant positive association between fruit and vegetables intakes and the number of contacts with participants during the intervention.

Further subgroup and sensitivity analysis and meta-regression results were reported in the review. No evidence of publication bias was found.

Authors' conclusions

Dietary interventions are effective at increasing fruit and vegetables and fish intake among adults in the retirement transition age range, sustainable in the longer term and likely to be of public health significance.

CRD commentary

The review question and inclusion criteria were clear. The search was comprehensive. Efforts were made to find published and unpublished studies, thus minimising the risk of publication bias. However, the search was restricted to studies in English so studies in other languages may have been missed. Attempts were made to minimise reviewer errors and bias in the review process. Quality of the included trials was assessed but full results were not reported, which made it difficult to interpret the reliability of the review findings; the authors reported that the studies were of good quality. All outcomes were self-reported so there was a risk of performance bias.

Appropriate methods were used to pool data. Statistical heterogeneity was assessed and explored in subgroup and sensitivity analyses and meta-regression.

The authors' conclusion reflects the evidence presented and despite high heterogeneity the findings showed a consistently positive effect of interventions on dietary behavior across the studies with respect to fruit and vegetable consumption. The results were also positive for meat and fish but this was based on a smaller number of studies. The authors acknowledged the limitations in the evidence.

Implications of the review for practice and research

Practice: The authors stated that the results provided evidence to support the development of interventions to improve dietary behavior at this life-stage to promote health and well-being and reduce the risks of age-related disease and associated costs to society.

Research: The authors did not state any implication for research.

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