Telephone-based counseling improves dietary fat, fruit, and vegetable consumption: a best-evidence synthesis

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CRD summary
This review evaluated the effects of telephone-based counseling on improving dietary fat, fruit and vegetable consumption in adults. The authors concluded that these interventions are effective and may be particularly relevant to women at high risk of cancer. The authors' conclusions reflect the evidence presented but, owing to some methodological weaknesses in the review process, their reliability is unclear.

Authors' objectives
To evaluate the effects of telephone-based counselling interventions on increasing fruit and vegetable consumption and decreasing dietary fat consumption.

Searching
Relevant studies published in English from 1 January 2000 to 31 December 2004 were sought from PubMed and PsycINFO; the search terms were reported. The reference lists of selected studies were checked to identify additional studies.

Study selection

Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were eligible for inclusion in the review.

Specific interventions included in the review
Studies where at least one treatment arm comprised standard telephone-based counselling (live interventionist without a video stream) as the primary component were eligible for inclusion. In the included studies, telephone counselling was delivered by registered dieticians, registered nurses, counsellors, psychologists, health educators, information specialists and health students. Counselling was based on Social Cognitive Theory, themes from the Transtheoretical Model, and Motivational Interviewing. Interventions were supplemented with written nutrition information, personalised feedback letters, meal replacements, computerised assessments, group meetings, clinical follow-ups and e-counselling. Where reported, the average number of sessions was 3.4 (range: 1 to 7) over 23.4 weeks (range: 7 to 52), with an average call length of 16.5 minutes (range: 8 to 25). Control conditions included a nutrition assessment, advice and written information.

Participants included in the review
Studies of adults were eligible for inclusion. The majority of included participants were white, middle-aged women and many were reported to have existing cancer, diabetes or heart disease. Most of the studies were conducted in the USA.

Outcomes assessed in the review
Studies that reported direct assessments of fruit/vegetable or dietary fat consumption were eligible for inclusion. The secondary outcomes of interest were clinical end points such as blood-pressure, lipid profiles, weight loss and behavioural biomarkers. Dietary outcome measures were assessed by validated self-report instruments, while serum biomarkers were used as proxy measures in some studies. The outcome measures for dietary fat intake were varied.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors did not state that they assessed validity.

**Data extraction**
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. For the primary outcomes of interest, effect sizes were calculated for each study using the standardised mean differences between intervention and control groups at the last follow-up. Study authors were contacted where information was missing; where this was unsuccessful, follow-up standard deviations were imputed using baseline values. For secondary outcomes, between-group differences in change scores were reported, where possible.

**Methods of synthesis**
How were the studies combined?
The studies were combined in a narrative.

How were differences between studies investigated?
Study differences were presented in tabular format and discussed within the text.

**Results of the review**
Nine RCTs (n=8,573) were included in the review. The sample sizes ranged from 56 to 2,970.

Study attrition ranged from 1 to 40%.

**Fruit and vegetable consumption.**
In studies of participants receiving telephone-based counselling interventions relative to usual care, statistically significant (p-values and significance level not reported) favourable effect sizes (median 0.41, range: 0.08 to 2.47) were reported across 6 studies (n=7,311) for improved fruit and vegetable consumption up to a 12-month follow-up assessment. Greater improvements were noted where the intervention was exclusively focused on fruit and vegetable consumption and in studies containing women diagnosed with early stage breast cancer or at high risk for developing cervical cancer.

**Dietary fat intake.**
In studies of participants receiving telephone-based counselling interventions relative to usual care, statistically significant (p-values and significance level not reported) favourable effect sizes (median 0.22, range: 0.20 to 0.92) were reported in 5 studies (n=5,987) for reductions in dietary fat intake, with follow-up assessment ranging from 7 weeks to 12 months. The rate of decrease was around 5% higher in the intervention group compared with controls. One study reported equivocal results for dietary fat intake, although clinical outcomes were positive (see below).

**Clinical outcomes.**
Significant reductions in total cholesterol, low-density lipoprotein cholesterol, body mass index, along with favourable blood-pressure results, were reported in 2 studies (n=3,762) where telephone counselling was compared with participants receiving usual care. Another study (n=320) reported significant improvements in ratios of total to high-density lipoprotein levels at 12 months in the telephone-based counselling group compared with controls, despite equivocal results for dietary improvement (see above).

**Authors' conclusions**
Telephone-based counselling interventions are effective in promoting improvements in dietary fat intake and fruit and vegetable consumption in adults. These interventions may be particularly relevant to women at high risk of developing cancer. Such interventions are also associated with improvements in blood lipids and weight.
CRD commentary
The review question was clear and the inclusion criteria were specific. The search strategy was centred on study retrieval from two electronic databases and there was no apparent attempt to retrieve unpublished material. This, along with the restriction to English language papers, means that relevant studies might have been missed and publication and language biases cannot be ruled out. Methods used to select the studies and extract the data were not described. Although levels of evidence were reported based on a hierarchy of study designs, there was no formal quality assessment of the included studies. Together, these represent further indications of potential bias and error.

Sufficient details of the primary studies were reported. Given the differences between the studies, a narrative synthesis was appropriate. The authors appropriately acknowledged some of the difficulties associated with evaluating heterogeneous studies in this topic area and offered some useful directions for research and practice. The authors’ conclusions reflect the evidence presented; however, owing to potential weaknesses arising from a limited search, along with the lack of a detailed quality assessment and transparency in the review process, their reliability is unclear.

Implications of the review for practice and research
Practice: The authors stated that telephone-based counselling may be best used to complement clinical care for high-risk individuals, and should be delivered by practitioners who are well trained in the theory of dietary behaviour change.

Research: The authors stated that future research should address long-term follow-up (beyond 1 year) of various intensities of interventions, and more diverse populations.

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