Nutrition and physical activity interventions to reduce cardiovascular disease risk in health care settings: a quantitative review with a focus on women

Wilcox S, Parra-Medina D, Thompson-Robinson M, Will J

Authors' objectives
To evaluate the impact of diet and physical activity interventions delivered in health care settings on cardiovascular disease risk factors in women.

Searching
MEDLINE, CINAHL, Current Contents and PsycINFO were searched from 1980 to 2000. Search terms pertinent for diet, exercise, counselling, women, and African American women were used and are listed in the review article. The bibliographies of retrieved original and review articles were also searched.

Study selection
Study designs of evaluations included in the review
All clinical trials were eligible for inclusion in the review. All were randomised controlled trials (RCTs) or quasi-experimental trials.

Specific interventions included in the review
Studies of diet or physical activity interventions delivered in health care settings were eligible for inclusion in the review. The details of the individual interventions are listed in the review. They encompass advice (e.g. counselling, by mail, training, classes) on diet or physical activity, or a combination with or without the guidance of a behaviour theory. All of the included studies had a control (presumably no intervention) or minimal intervention group.

Participants included in the review
Only studies that focused exclusively on women (aged at least 18 years) or included women as participants were included in the review. Most of the studies were conducted in primary care with no details given on the level of cardiovascular disease, if any, of the individual populations.

Outcomes assessed in the review
All the studies included in the review had to report at least one cardiovascular disease risk factor as an outcome variable. These could be any measure of blood-pressure, blood lipids, body mass index (BMI), body weight, dietary fat, energy intake, dietary fibre, or level of physical activity.

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

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

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction. The categories of data extracted were: study details; design and sample; setting and theory; intervention; follow-up; dependant variables and results and effect size. A common effect size r (Pearson Product Moment Correlation) was computed for all studies. The computation converts all outcomes to a standard metric enabling comparisons across studies that used different outcomes.
Methods of synthesis
How were the studies combined?
A mean effect size r was calculated for each cardiovascular disease risk factor: physical activity (physical activity and stage of change); BMI or weight; diet (fat, caloric intake, general, fibre, stage of change); blood-pressure (diastolic and systolic); serum cholesterol (total, high-density lipoprotein, low-density lipoprotein). The correlation coefficients were not weighted by sample size prior to pooling.

How were differences between studies investigated?
The values of r were investigated to see if they differed when stratified by important moderating variables: age, use of behavioural theory, type of intervention, type of comparison group, and follow-up period

Results of the review
Forty-two papers were included in the review. Of these, 32 interventions and 170 correlation coefficients could be computed.

The average effect of treatment was generally small but statistically significant for physical activity or exercise (37 trials), BMI or weight (22 trials), dietary fat (21 trials), systolic blood-pressure (14 trials), diastolic blood-pressure (14 trials), total cholesterol (25 trials), and low-density lipoprotein cholesterol (9 trials). The correlation coefficients were not statistically significant for physical activity stage of change (5 trials), energy intake (2 trials), general dietary factors (2 trials), or high-density lipoprotein cholesterol (10 trials).

Impact of moderating variables.
Age: except for systolic blood-pressure, the interventions produced greater effects when the sample mean age was greater than 50 years.

Behaviour theory: there was no major impact on intervention effectiveness.

Type of intervention: diet-only interventions were generally more effective than physical activity or combined interventions in reducing body weight.

Comparison group: no consistent effect was noted (most used no-treatment or usual care control).

Follow-up period: the effects for physical activity interventions were usually greater when the follow-up was less than rather than more than 6 months.

A narrative subgroup review for African American women was included in this review. The results of this suggested that interventions targeted at specific populations might be effective.

Authors' conclusions
The analyses indicate that dietary or physical activity interventions aimed at reducing cardiovascular risk factors in women were, on average, effective. While the intervention effects tended to be modest in size according to standard criteria, they were generally statistically significant and likely to be of significance to public health.

CRD commentary
This review addressed the effectiveness of an intervention important in terms of public health. The inclusion and exclusion criteria were defined adequately and the search strategy appeared sufficiently comprehensive. Restricting the review to English language papers may have resulted in some papers being missed, but it is probably of little importance since the results of such studies are probably culture dependent. An argument could be made for including only U.S. studies. Given the number of RCTs it could also be argued that the inclusion of quasi-RCTs was unnecessary. No validity assessment was conducted on the included studies. Furthermore, the definition of 'quasi-experimental studies' was not given, such that the quality of the RCTs and other included studies cannot be judged by the reader. No details of the review process (number of reviewers, steps taken to avoid reviewer bias, and so on) were reported in the review.
The details of the individual studies were tabulated within the review. Due to the diversity of the outcome measures, which was inherent in this review, the use of a common effect size $r$ was appropriate, although the decision not to weight the effect sizes by the sample size of the primary study, within the meta-analysis performed, can be questioned. The attempt to find results of specific importance to African American women within the context of this very broad review does not seem appropriate. As the reviewers themselves found, questions of particular relevance to specific populations are best investigated in studies of the targeted population. Overall, the authors' conclusions are supported by the main findings of this review.

**Implications of the review for practice and research**

Practice: The authors state 'these findings are likely to be meaningful when considered from a public health perspective'.

Research: The authors state 'more studies are needed to address the effectiveness of physical activity and dietary counselling delivered in healthcare settings with financially disadvantaged and ethnically diverse individuals'.

**Funding**
The Heart Healthy and Ethnically Relevant Tools study, of which this review was a part, was supported by the Centers for Disease Control and Prevention, grant number U48/CCU409664-07.

**Bibliographic details**

**PubMedID**
11475446

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Age Distribution; Cardiovascular Diseases /prevention & control; Exercise; Female; Humans; MEDLINE; Nutritional Physiological Phenomena; Risk Factors; Time Factors; Women's Health

**AccessionNumber**
12001004268

**Date bibliographic record published**
31/07/2003

**Date abstract record published**
31/07/2003

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.