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Behavioral Counseling to Promote a Healthful Diet and Physical Activity for Cardiovascular Disease Prevention in Adults Without Known Cardiovascular Disease Risk Factors: Updated Systematic Review for the U.S. Preventive Services Task Force [Internet]

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Abstract

A healthy diet is characterized by a balanced and varied selection of meals and drinks that aids a person in attaining and sustaining a healthy weight. To carefully assess the proof regarding the harm and benefits of behavior therapy for the 1ry avoidance of cardiovascular illness in adults lacking recognized cardiovascular risk factors to educate the United States Preventive Services Task Force.This systematic review and meta-analysis encompassed nine research studies, submitting to the Cochrane Collaboration principles and conforming to the PRISMA declaration (Preferred Reporting Items for Systematic Reviews and Meta-analyses).Behavioral interventions enhanced levels of nutritional consumption and physical activity, with consistent benefits for healthful diets versus controls at 6+ months. Small, although significant variations have been detected in systolic blood pressure (−1.26 millimeters mercury [ninety-five percent confidence interval, −1.77 to −0.75]), total cholesterol (−2.85 milligrams per deciliter [ninety-five percent confidence interval, −4.95 to −0.75]), in addition to body mass index (−0.41 [ninety-five percent confidence interval, −0.62 to −0.19]) at the six- to twelve-month interval. Modest correlations with activity and dietary behaviors were observed, with no increased adverse events in intervention participants. Conclusion: Behavioral interventions significantly improve levels of dietary intake and physical activity, with healthy diets and programs showing significant benefits over 6+ months. Small improvements in blood pressure, cholesterol, and BMI were noted, with tailored approaches being particularly effective without increased adverse events.

Keywords: *Cardiovascular Disease Risk Factors, Physical Activity, Behavioral Counseling, Healthful Diet.*

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Introduction

The phrase "healthy diet" refers to a diverse and balanced selection of foods and beverages that aid a person in attaining and sustaining an appropriate weight, promoting health, and preventing illness (1).

Dietary therapy aimed at promoting a healthy diet emphasizes an increase of vegetables, fruits, fat-free or low-fat dairy, whole grains, and lean protein, as well as oil intake, while advocating for the reduction of foods high in sodium, trans fats, or saturated fats, as well as further sugars, as per the recommendations of the US Department of Agriculture and FDA of the United States (1).

Physical exercise is comprehensively characterized as any bodily movement that improves or sustains physical fitness and overall health.

Although data indicates that nutritious food habits, physical exercise, and reduced sedentary behavior correlate with decreased cardiovascular morbidity and mortality, most US cases fail to adhere to national guidelines for these practices (2).

Integrating counseling into 1ry care & implementing interventions referred to via 1ry care may enhance these habits and subsequently mitigate negative cardiac results (3).

The United States Preventive Services Task Force (USPSTF) provides multiple recommendations for cardiovascular disease prevention, encompassing healthy lifestyle counseling, screening and management of hypertension, obesity, and abnormal concentrations of glucose, as well as the use of aspirin and statins and interventions for tobacco cessation (2).

The aim of this research is to thoroughly evaluate proof regarding the advantages and disadvantages of behavior therapy for the 1ry avoidance of cardiovascular illness in adults lacking recognized risk factors of cardiovascular disease to guide the USPSTF (Mansoor et al., 2020).

Materials and Methods

This systematic review and meta-analysis have been performed on nine papers in accordance with the Cochrane Collaboration standards and adhered to the PRISMA declaration (Preferred Reporting Items for Systematic Reviews and Meta-analyses).

Search Strategy

We carried out a search of electronic databases (PubMed, Web of Science, and the Cochrane Library) using the subsequent keywords: Behavioral counseling, healthful diet, physical activity, disease prevention, and cardiovascular disease risk. Two authors independently evaluated the titles and abstracts of the search results. After the elimination of duplicate publications, the remaining research has been evaluated against the inclusion criteria. All relevant studies' complete texts have been acquired for evaluation against the specified inclusion criteria. Only research studies that met the requirements were further evaluated to summarize the results. The reference list of the selected publications was evaluated for studies that met the inclusion criteria.

Risk of a Biased Evaluation

The risk of bias and quality of our involved RCTs have been assessed by the ROB1 tool. The majority of our RCTs were judged low risk regarding the ROB1 tool.

Inclusion criteria: Studies included in our study encompassed full-text, English-language randomized controlled trials (RCTs), cohort studies, cross-sectional studies, and mixed-method articles that evaluated the healthful diet, behavioral counseling, physical activity, and cardiovascular disease prevention. The types

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of studies incorporated were cohort studies, RCTs, case-control studies, meta-analyses, and systematic reviews.

Exclusion criteria: We excluded investigations such as reviews, books, or commentaries, as well as studies that did not explicitly focus on physical activity and cardiovascular illness avoidance in adults without known CVD risk factors.

Data extraction: Information on sample size, patient characteristics, surgical outcomes, complications, and follow-up duration was extracted.

Results

Search Results

Upon our search across different databases, we found 504 included studies 210 duplicates were removed, 294 studies screened for title and abstract, 35 studies were examined for full text eligibility, finally we have nine distinct articles met our eligibility criteria and included in our research. Figure 1: represents PRISMA flow chart for research selection process.

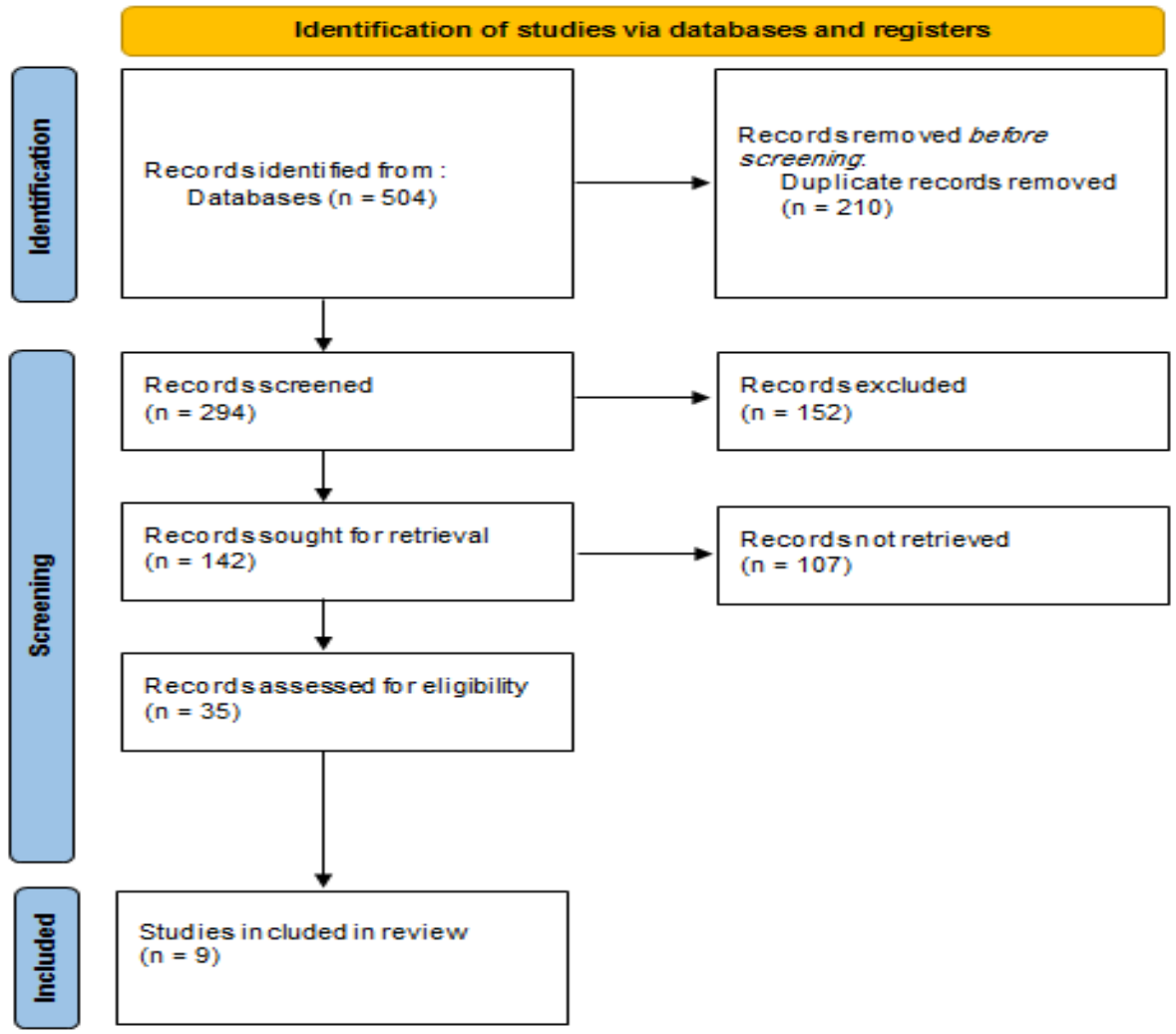

Figure 1. PRISMA Flow Chart for Study Selection Process

Baseline Characteristics of Involved Studies

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We have nine included studies all of our included studies were RCTs, in all of our studies duration is up to 52 weeks, mean age for our participants ranged from 19 to 63 years old. (Table 1)

Table 1. Demographic Data of Consist of Studies

Study NO.	Study ID	Study design	Country	Sample Size (%women)	Mean age	Intervention	Duration (wk)
1	Aadahl et al, (4)	RCT	Denmark	166 adults (57.2)	52	Counseling	26
2	Bennett et al, (5)	RCT	US	194 overweight or obese black women (100)	35.4	Counseling, tailored print materials, & self-monitoring	52
3	Elley et al, (6)	RCT	New Zealand	878 adults (66.3)	57.9	Counseling with tailored prescription	52
4	Marcus et al, (7)	RCT	US	292 Hispanic/Latina women (100)	40.7	Tailored print mailings & self-monitoring	52
5	Marshall et al, (8)	RCT	Australia	462 adults (57.6)	49	Tailored print mailing	14
6	TokunagaNakawatase et al, (9)	RCT	Japan	216 adults with family history of type 2 diabetes (34.8)	45.2	Computer-tailored print mailings	26
7	Valve et al, (10)	RCT	Finland	3059 college-aged women (100)	19	counseling	104
8	Thompson et al, (11)	RCT	US	Forty-nine older adults (81.2)	79.5	Group counseling	24
9	Tinker et al, (12)	RCT	US	48 835 postmenopausal women (100)	62.2	Group counseling	312

Risk of Bias of Our Involved Studies

Risk of bias and quality of our involved RCTs were assessed using ROB1 tool majority of our RCTs were judged low risk regarding ROB1 tool only Tinker et al, (12) study reported high risk regarding performance bias.

Figure 2 and table 2 represent Risk of bias graph and summary of our involved studies.

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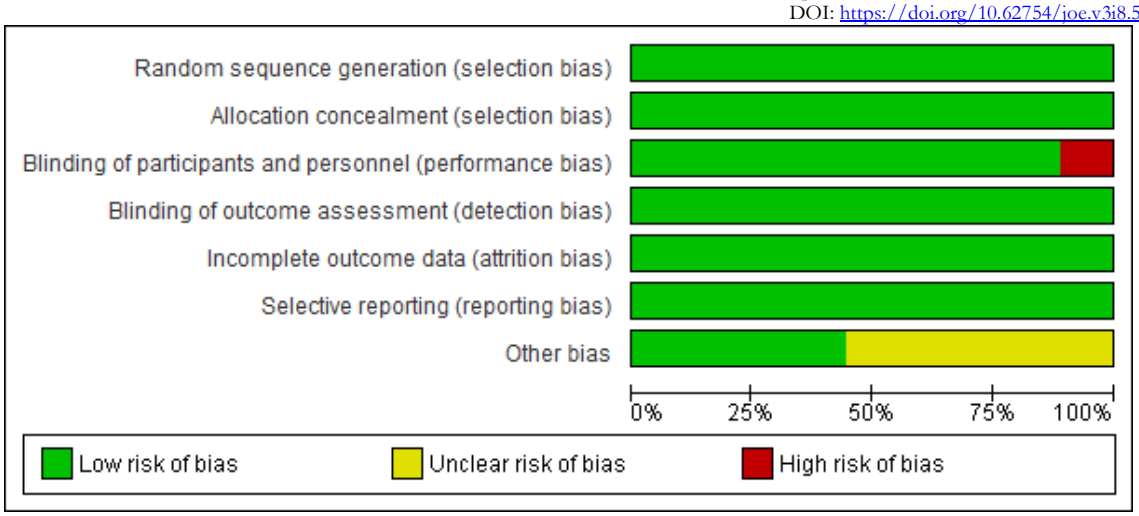

Figure 2. Risk Of Bias Graph.

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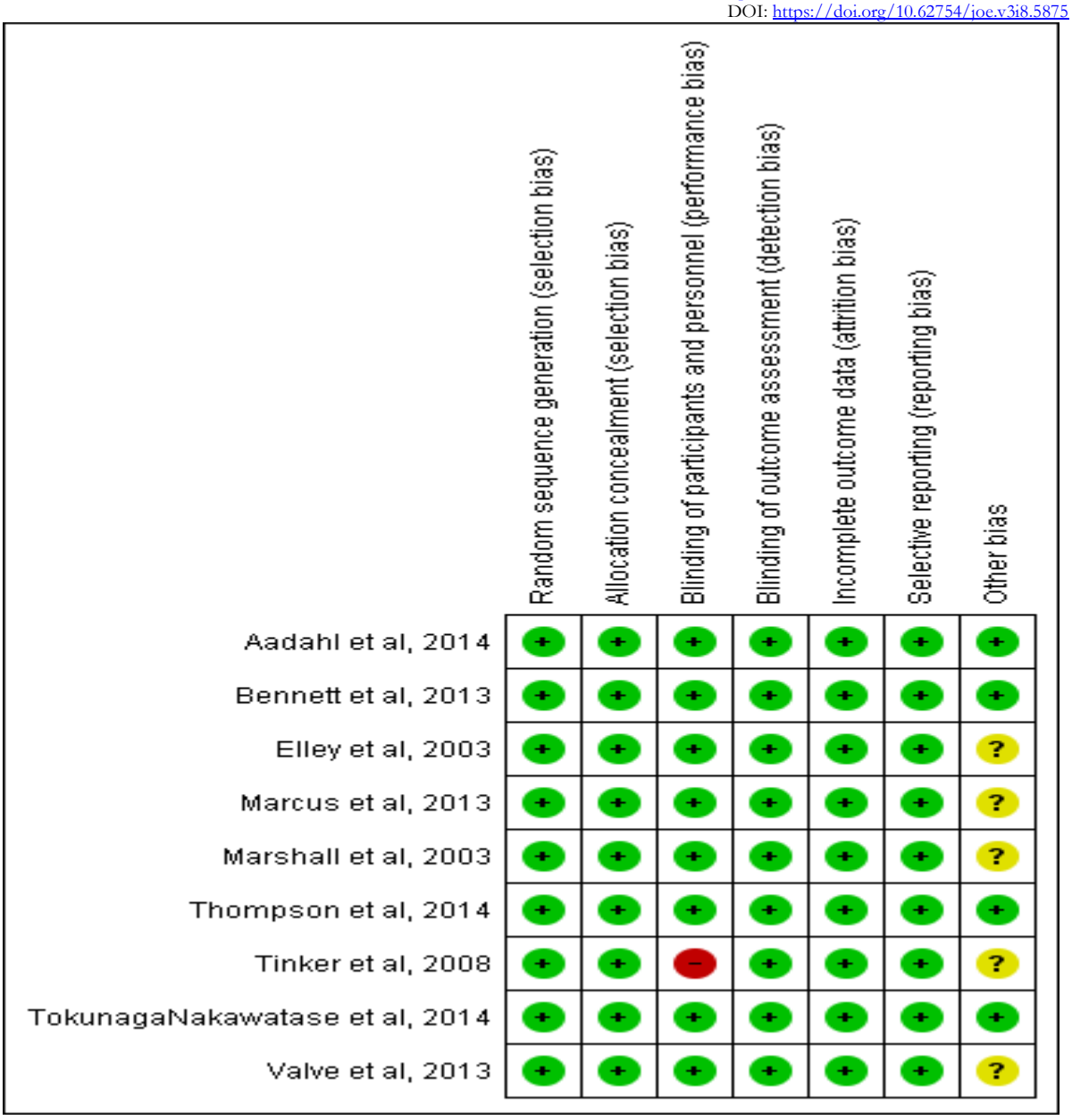

Table 2. Risk of Bias Table

Outcomes

Evidence indicated that behavioral interventions typically enhanced individuals' levels of nutritional consumption & physical activity. Mean among-group variations for dietary results indicated a consistent advantage for healthy diet interventions (with or without physical activity messages) compared to control groups at a monitoring of six months or more; however, the precision regarding the magnitude of impacts was significantly impacted by physical activity interventions. There was proof of a small, statistically significant variance in among-group mean variations for SBP (−1.26 millimeters mercury [ninety-five percent confidence interval, −1.77 to −0.75]), total cholesterol level (−2.85 milligrams per deciliter [ninety-five percent confidence interval, −4.95 to −0.75]), and BMI (−0.41 [ninety-five percent confidence interval, −0.62 to −0.19]) at between six and twelve months. Furthermore, there were minor to moderate correlations with behaviors of dietary practices and physical activity. Nonetheless, there wasn't proof indicating a higher occurrence of severe adverse events, injuries, or falls among intervention individuals compared to control groups.

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Discussion

The present research demonstrated that behavioral therapies typically enhanced participants' levels of nutritional consumption and physical activity. Mean among-group variations for nutritional results indicated a consistent advantage for healthful diet interferences (with or without physical activity messages) compared to control groups with at least six months of monitoring, although the precision regarding the magnitude of impacts was significantly influenced by physical activity interventions.

Concerning physical activity levels, Valve et al. (10) aimed to develop and assess the efficacy of a tailored, long-term lifestyle counseling approach to enhance healthy physical activity, improve dietary as well as sleep behaviors, and avoid weight gain in young women. They stated a statistically significant distinction prior to and following the intervention (p-value below 0.001).

Marshall et al. (8) investigated whether stage-targeted, self-instructional booklets transmitted to participants could enhance physical activity levels in a randomly chosen sample of the population. After six months, those in the intervention group who acknowledged getting and engaging with the materials were significantly more likely to meet the sufficient physical activity criterion versus the control group.

Tokunaga-Nakawatase Y et al. (9) aimed to examine the impact of a computer-supported indirect-form lifestyle-modification program utilizing LISS-DP as a clinically viable strategy for primary prevention on dietary and physical activity habits in adults with a familial predisposition to type 2 diabetes. The research found that the group of lifestyle intervention exhibited a significantly higher reduction in energy intake of six months post-baseline in comparison with the control group (−118.31 and −24.79 kilocalories per day, correspondingly; p-value less than 0.0099).

Elley CR et al. (6) aimed to evaluate the long-term efficacy of the "green prescription" program, a clinician-led initiative in general practice that offers counseling on physical activity. They stated that leisure-time physical activity and overall energy expenditure increased more significantly in the intervention group than the control group.

The current results indicated a small, statistically significant variance in mean values among groups for systolic blood pressure (−1.26 millimeters mercury [ninety-five percent confidence interval, −1.77 to −0.75]), total cholesterol level (−2.85 milligrams per deciliter [ninety-five percent confidence interval, −4.95 to −0.75]), and BMI (−0.41 [ninety-five percent confidence interval, −0.62 to −0.19]) at six to twelve months.

Concerning body mass index classification, Valve et al. (10), who studied 3,059 young women aged between seventeen and twenty-one years at baseline, demonstrated a statistically significant change prior to and following the intervention (p-value below 0.001).

Bennett et al. (5) conducted a study to compare alterations in body mass index, systolic blood pressure, and total cholesterol levels over a period of twelve months amongst Black females randomized to a 1ry care-based behavioral weight increase prevention intervention versus usual care. They stated a statistically significant distinction among both groups.

Conversely, Tokunaga-Nakawatase Y et al. (6) determined that a computer-based, non-face-to-management programtyle management positively influenced dietary habits only throughout the intervention interval, noting statistically insignificant variance in a body mass index among the lifestyle intervention and control groups (p=0.1521).

Aadahl M et al. (4) investigated the impact of a personalized face-to-face motivational counseling intervention on decreasing sitting time and found no statistically significant reduction in total cholesterol levels across the groups studied.

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Elley CR et al. (6) demonstrated that diastolic and systolic blood pressure significantly improved from baseline in the intervention group; however, the alteration didn't differ significantly from that observed in the control group.

Thompson WG et al. (11) aimed to identify a twenty percent rise in activity with ninety percent power at the 0.05 significance level, assuming an association of 0.5 among baseline and final data, utilizing the two-sample t-test to evaluate the major hypothesis. The intervention has been shown to have an insignificant impact on body weight, activity, or blood parameters (p-value over 0.05).

The results indicated slight to moderate correlations between behaviors of physical activity and eating habits. Nonetheless, there wasn't evidence indicating a higher occurrence of severe adverse events, injuries, or falls among intervention people compared to control groups.

Concerning dinner habits, Valve et al. (10) determined that the brief solution-focused intervention, featuring individually tailored content, facilitated modest, enduring enhancements in health behaviors related to physical activity, meal regularity, and/or earlier bedtimes, demonstrating a statistically significant distinction pre- and post-intervention ($p = 0.006$).

Marcus et al. (7) aimed to assess the effectiveness of a culturally adapted, Spanish-language, individualized, computer expert system-driven, print-based intervention for physical activity among adult Latinas. They demonstrated a significant therapy impact, with intervention participants reporting an average of 41.36 minutes more moderate-to-vigorous physical activity (MVPA) than control participants at six months (p-value less than 0.01).

Tinker LF et al. (12) stated that at year one, the intervention group exhibited a lower percentage of total dietary fat as a proportion of energy and higher consumption of vegetables, fruits, and grains, as well as dietary glycemic index and glycemic load compared to the comparison group; however, insignificant distinction has been observed among the groups concerning physical activity.

Conclusion

Behavioral interventions generally improve levels of physical activity and food consumption, with significant benefits in healthful diets and physical activity programs over controls at 6+ months. Small improvements in blood pressure, cholesterol, and BMI were noted, though effects varied, and some studies found no significant differences. Tailored approaches were particularly effective, with no increased adverse events in intervention groups.

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