Appendix E2.26: Evidence Portfolio

Part D. Chapter 2: Dietary Patterns, Foods and Nutrients, and Health Outcomes

What is the relationship between dietary patterns and risk of cardiovascular disease?

Conclusion Statement: The DGAC concurs with the conclusions of the NEL Dietary Patterns Systematic Review Project and AHA/ACC *Guideline on Lifestyle Management to Reduce Cardiovascular Risk* that strong and consistent evidence demonstrates that dietary patterns associated with decreased risk of CVD are characterized by higher consumption of vegetables, fruits, whole grains, low-fat dairy, and seafood, and lower consumption of red and processed meat, and lower intakes of refined grains, and sugar-sweetened foods and beverages relative to less healthy patterns. Regular consumption of nuts and legumes and moderate consumption of alcohol also are shown to be components of a beneficial dietary pattern in most studies. Randomized dietary intervention studies have demonstrated that healthy dietary patterns exert clinically meaningful impact on cardiovascular risk factors, including blood lipids and blood pressure. Additionally, research that includes specific nutrients in their description of dietary patterns indicate that patterns that are lower in saturated fat, cholesterol, and sodium and richer in fiber, potassium, and unsaturated fats are beneficial for reducing cardiovascular disease risk.

DGAC Grade: Strong

Review of Evidence

The DGAC examined research compiled in the NEL Dietary Patterns Systematic Review Project,[1] which included 55 articles summarizing evidence from 52 prospective cohort studies and 7 RCTs, and the 2013 AHA/ACC *Guideline on Lifestyle Management to Reduce Cardiovascular Risk* and associated NHLBI Lifestyle Report,[2] which included primarily RCTs. The Committee drew additional evidence and effect size estimates from six published systematic reviews/meta-analyses published since 2008 that included one or more studies not covered in the NEL or NHLBI Lifestyle reports.[3-8] In total, 142 articles were considered in these reports, of which 35 were included in two or more reviews. Little evidence on the contribution of dietary patterns to CVD risk factors in the pediatric populations was available, and that which was published was not systematically reviewed.

Most evidence examining hard disease endpoints comes from large, prospective cohort studies in adults using a priori scores to rank individuals with respect to adherence to dietary patterns of interest. Though the observational design allows the necessary duration of follow-up to observe CVD endpoints, comparison across studies was difficult because of different methods for deriving scores and different versions of scores measuring adherence to the same dietary

pattern. In the Mediterranean dietary indices and the AHEI scores, moderate alcohol was included as a "positive" component (associated with potential benefits). Red and processed meats were "negative" (potentially detrimental) components in the Mediterranean scores, AHEI scores, and DASH. Certain scores also included sugars or sugar-sweetened beverages as negative components. Poultry was considered as a positive component in the original AHEI. Total high-fat dairy was a negative component in the Mediterranean diet scores, but dairy was a positive component when meeting recommended intakes for the HEI-2005, and low-fat dairy was positive in the DASH scores. As the NEL systematic review points out, several components of scores associated with decreased CVD risk recurred in multiple dietary patterns and were associated as part of scores and as individual components with reduced CVD risk. These included consumption of vegetables, fruits, whole grains, nuts, legumes, unsaturated fats, and fish.

The NHLBI Lifestyle Report summarized the evidence from two RCTs of the DASH dietary pattern and two trials testing DASH variations with differing levels of sodium or macronutrients. The diet provided to participants in standard DASH intervention trials was high in vegetables, fruits, low-fat dairy products, whole grains, poultry, fish, and nuts. It also was low in sweets, sugar-sweetened beverages, and reduced in (or lower in) red and processed meats. The DASH dietary pattern is high in fiber and potassium and low in sodium, saturated fat, total fat, and cholesterol. It is rich in potassium, magnesium, and calcium, as well as protein and fiber.

In contrast to the patterns described above, vegetarian diets were defined by what they excluded. Variations included: vegan (no meat, fish, eggs, or dairy); lacto-ovo vegetarian (includes eggs and dairy, but no fish or meat), and pesco vegetarian (includes fish, but no meat) diets. The content of these diets varied substantially, though they tended to emphasize plant based foods, especially fruits and vegetables, legumes, nuts, and whole grains.

Dietary Patterns and Blood Pressure (BP)

DASH or DASH-style Dietary Patterns

The NEL systematic review and AHA/ACC Lifestyle Guideline conclude that strong and consistent evidence from RCTs demonstrates that compared to a dietary pattern that is relatively high in saturated fat and sodium and low in vegetables and fruits, the DASH-style dietary pattern reduced BP by approximately 6/3 mmHg (systolic blood pressure/diastolic blood pressure) across subgroups defined by sex, race, age, and hypertension status. The DASH trial provided all food to participants for 8 weeks. Fat intake was relatively low at 26 percent of energy (7 percent each monounsaturated and saturated, 10 percent polyunsaturated), compared to 36 percent in the control group. Carbohydrates accounted for 57 percent of energy and protein for 18 percent. Sodium was stable at 3,000 mg/day and body weight did not change. Variations of the DASH diet also lowered blood pressure: in the OmniHeart Trial, compared to the standard DASH, replacing 10 percent of calories from carbohydrate with either the same calorie content of protein or with unsaturated fat (8 percent MUFA and 2 percent PUFA) lowered systolic BP by 1 mmHg. Among adults with BP 140–159/90–95 mmHg, these substitutions lowered systolic BP by 3 mmHg relative to standard DASH.[1,2]

Observational evidence summarized in the NEL report included one cohort showing that increased DASH score was associated with small, but decreased levels of systolic and diastolic BP over time;[9] two others cohorts showed no relationship between DASH scores and risk of hypertension.[10, 11]

Mediterranean-Style Dietary Patterns

Several RCTs provide limited to moderate evidence on the benefits of a Mediterranean-style diet for reducing blood pressure. The AHA/ACC Lifestyle Guideline conclude that consuming a Mediterranean dietary pattern instead of a lower-fat dietary pattern had beneficial effects on blood pressure. The NHLBI Lifestyle Report reviewed two RCTs of free-living middle-aged or older adults (with type 2 diabetes or at least three CVD risk factors) in which a Mediterranean diet intervention reduced BP by 6–7/2–3 mmHg.[12, 13] The report also reviewed one observational study of healthy younger adults. Higher adherence to a Mediterranean-style diet, as measured through a Mediterranean score, was associated with a decrease in BP of 2–3/1–2 mmHg.[14]

Vegetarian Dietary Patterns

Evidence for the blood pressure benefits of vegetarian dietary patterns is more limited, but moderately consistent trends appear to exist. A recent meta-analysis of seven RCTs found that consumption of vegetarian diets was associated with a reduction in mean systolic blood pressure (-4.8 mm Hg; 95% CI = -6.6 to -3.1; $p<0.01$) and diastolic blood pressure (-2.2 mm Hg; 95% CI = -3.5 to -1.0) compared with the consumption of omnivorous diets.[8] The AHA/ACC Lifestyle Guideline did not find sufficient evidence to examine vegetarian dietary patterns, and the NEL systematic review summarized only three studies comparing blood pressure outcomes in lacto-ovo vegetarian diets versus non-vegetarian diets in which meat and fish were consumed. Of the two studies, one was a large prospective cohort that found no association with blood pressure,[15] and the other was a RCT among individuals with hypertension that demonstrated a decrease in systolic blood pressure, but not diastolic blood pressure.[16] The more recent EPIC-Oxford cohort found lower systolic, but not diastolic blood pressure compared to the findings of Crowe, 2013.[17]

Other Dietary Patterns

As summarized in the NEL systematic review, adherence to the *2005 Dietary Guidelines for Americans* was related to lower blood pressure in one study of healthy young adults. Zamora et al reported 20-year findings from the CARDIA study including 4,381 Black and White young adults.[18] Participants in the highest (vs. lowest) quartile of adherence to the 2005 Dietary Guidelines had significantly less increase in systolic and diastolic blood pressure over time.

Dietary Patterns and Blood Lipids

DASH or DASH-style Dietary Patterns

As reviewed in the NHLBI Lifestyle Report, RCTs of the DASH diet show favorable effects on low-density lipoprotein cholesterol (LDL-C) and total cholesterol: high-density lipoprotein cholesterol (total-C: HDL-C) ratio, and no effect on triglycerides (TG). Benefits were seen with a

variety of different macronutrient compositions, though they were enhanced when some carbohydrates in the standard DASH pattern were replaced with protein or unsaturated fat. In the standard DASH, when food was supplied to adults with a total cholesterol level of less than 260 mg/dL and LDL-C less than 160 mg/dL, and body weight was kept stable, the DASH dietary pattern compared to the control diet decreased LDL-C by 11 mg/dL, decreased HDL-C by 4 mg/dL, and had no effect on TG. The OmniHeart trial tested the DASH dietary pattern with different macronutrient compositions among adults with average baseline LDL-C 130 mg/dL, HDL-C 50 mg/dL, and TG 100 mg/dL. Modifying the DASH diet by replacing 10 percent of calories from carbohydrate with 10 percent of calories from protein decreased LDL-C by 3 mg/dL, decreased HDL-C by 1 mg/dL, and decreased TG by 16 mg/dL compared to the DASH dietary pattern. Replacing 10 percent of calories from carbohydrate with 10 percent of calories from unsaturated fat (8 percent MUFA and 2 percent PUFA) decreased LDL-C similarly, increased HDL-C by 1 mg/dL, and decreased TG by 10 mg/dL compared to the DASH dietary pattern.[2]

Mediterranean-style Dietary Patterns

As with blood pressure, few trials have evaluated the effects of Mediterranean dietary patterns on blood lipids. According to the AHA/ACC Lifestyle Guideline, consuming a Mediterranean-style diet (compared to minimal or no dietary advice) resulted in no consistent effect on plasma LDL-C, HDL-C, and TG. In part, this was due to substantial differences in dietary interventions conducted among free-living middle aged or older adults with or without CVD or at high risk for CVD.[2] In the PREDIMED trial (reviewed in both the NHLBI Lifestyle and NEL reports), both treatment groups (Mediterranean diet +olive oil or +nuts) had favorable changes in HDL-C, total-C: HDL-C ratio and TG when compared to the control group, which received minimal advice to follow a lower-fat diet.[12] One of the prospective cohort studies reviewed by the NEL showed each one-point increase in alternate Mediterranean diet score assessed in adolescence and early adulthood was associated with a -6.19 (-10.44, -1.55) mg/dL lower total cholesterol in adulthood but no significant effects on HDL-C.[19] Of other observational cohorts reviewed, one reported adherence to a Mediterranean diet was associated with favorable changes in HDL-C and TG,[20] and another found no associations between adherence to a Mediterranean diet and blood lipids.[21]

Vegetarian Dietary Patterns

The NEL systematic review included three articles on vegetarian patterns that measured blood pressure or blood lipids.[15-17] One study reported decreased total-C[15] and another reported decreased non-HDL-C in vegetarian versus non-vegetarian participants.[17]

Other Dietary Patterns

Of note, adherence to the *2005 Dietary Guidelines for Americans* also was related to higher HDL-C levels in a cohort of Black and White young adults.[18]

Dietary Patterns and Cardiovascular Disease Outcomes

The NHLBI Lifestyle review did not include any trials examining the evidence of particular dietary patterns with CVD outcomes. Overall, the NEL systematic review found that individuals whose diets mirrored the dietary patterns of interest (typically compared with diets having lower scores) was associated with lower CVD incidence and mortality in 14 out of 17 studies. The studies were predominantly observational, but included some trial evidence, and they typically assessed dietary intakes through self-report. The effect sizes varied substantially, with the decrease in risk of CVD ranging from 22 to 59 percent for increased adherence to various Mediterranean-style dietary patterns and from 20 to 44 percent for increased adherence to a U.S. Dietary Guidelines-related pattern (e.g., HEI or AHEI and updates). The majority of studies that assessed coronary heart disease (CHD) incidence or mortality also reported a favorable association between adherence to a healthy dietary pattern and CHD risk. The lower CHD risk ranged from 29 to 61 percent for greater adherence to Mediterranean-style dietary patterns, from 24 to 31 percent for greater adherence to a U.S. Dietary Guidelines-related pattern, and from 14 to 27 percent for greater adherence to DASH. Similarly, the majority of studies assessing stroke incidence or mortality reported favorable associations, with the lower stroke risk ranging from 13 to 53 percent for greater adherence to a Mediterranean-style dietary pattern and from 14 to 60 percent for greater adherence to a U.S. Dietary Guidelines-related pattern.[1]

Mediterranean-style Dietary Patterns

To gather additional information on dietary patterns and CVD outcomes, the DGAC consulted two meta-analyses,[4, 7] which included many of the same observational prospective cohort studies as one another and as the NEL systematic review. These meta-analyses each reported summary estimates across studies as a 10 percent reduction in risk of CVD (fatal or nonfatal clinical CVD event) per 2-increment increase in adherence to the Mediterranean-style diet. The NEL report also included results from the largest Mediterranean diet trial, PREDIMED, which found that a Mediterranean diet (plus extra virgin olive oil or nuts) had favorable effects in high-risk participants compared to the control group who were advised to reduce dietary fat intake. An approximately 30 percent decrease in risk of major CVD events (a composite endpoint including myocardial infarction, stroke, and deaths) was observed and the trial was stopped early for meeting benefit requirements.[1, 22] According to food questionnaires measuring adherence to the assigned diet by the end of follow-up, the intervention groups had significantly increased consumption of fish and legumes and non-significant reductions in refined grains and red meat from baseline, in addition to increased intake of supplemental foods (olive oil or nuts depending on the intervention arm), compared to the control group.

DASH-style Dietary Patterns

A recent meta-analysis[6] of six prospective cohort studies with CVD endpoints assessed DASH-style diet through the Fung et al. method,[23] which assigns points based on population-specific quintiles of eight DASH dietary pattern components: fruits, vegetables, nuts and legumes, whole grains, low-fat dairy, sodium, red and processed meats, and sweetened beverages. This meta-analysis reported that greater adherence to a DASH-style diet significantly reduced CVD

(Relative Risk [RR]=0.80; 95% CI = 0.74 to 0.86), CHD (RR=0.79; 95% CI = 0.71 to 0.88), and stroke (RR=0.81; 95% CI = 0.72 to 0.92). All of the studies meta-analyzed also were included the NEL's evidence base for the DASH-style diet.

Vegetarian Dietary Patterns

The NEL systematic review concluded that evidence for the effects of vegetarian dietary patterns on cardiovascular endpoints is limited. Most of this evidence was from prospective cohort studies; four out of six studies suggested that a vegetarian dietary pattern was associated with reduced incidence of ischemic heart disease (IHD) or CVD mortality. A meta-analysis of seven studies related to CVD mortality and vegetarian diet[3] (including two of the studies from the NEL systematic review) found that mortality from IHD was significantly lower in vegetarians than in non-vegetarians (RR=0.71; 95% CI = 0.56 to 0.87). The authors estimated a 16 percent lower mortality from circulatory diseases (RR=0.84; 95% CI = 0.54 to 1.14) and a 12 percent lower mortality from cerebrovascular disease (RR=0.88; 95% CI = 0.70 to 1.06) in vegetarians compared to non-vegetarians.

Table 1. Summary of existing reports, systematic reviews, and meta-analyses examining the relationship between dietary patterns and risk of cardiovascular disease

Question/ Purpose AMSTAR Rating*	Dietary Patterns and Outcomes	Included Studies** (Number and Study Design)	Evidence/ Conclusion Statement from Existing Report/ SR/ MA
NEL Dietary Patterns Systematic Review Project, 2014			
Overarching Finding/ Recommendation: Dietary patterns associated with decreased risk of cardiovascular disease were characterized by regular consumption of fruits, vegetables, whole grains, low-fat dairy and fish, and were low in red and processed meat and sugar-sweetened foods and drinks. Regular consumption of nuts and legumes and moderate consumption of alcohol were also shown to be beneficial in most studies. Additionally, research that included specific nutrients in their description of dietary patterns indicated that patterns that were low in saturated fat, cholesterol, and sodium and rich in fiber and potassium may be beneficial for reducing cardiovascular disease risk.			
What is the relationship between adherence to dietary guidelines/ recommendations or specific dietary patterns, assessed using an index or score, and risk of cardiovascular disease?	Dietary pattern assessed using index/score methodology HTN, BP, TG, LDL-C, HDL-C, incidence of CVD, CVD-related death, MI, stroke	55 52 PCS (from 36 cohorts); 3 RCT	There is strong and consistent evidence that in healthy adults increased adherence to dietary patterns scoring high in fruits, vegetables, whole grains, nuts, legumes, unsaturated oils, low-fat dairy, poultry and fish; low in red and processed meat, high-fat dairy, and sugar-sweetened foods and drinks; and moderate in alcohol is associated with decreased risk of fatal and non-fatal cardiovascular diseases, including coronary heart disease and stroke. (Strong)
Are prevailing patterns of dietary intake in a population, assessed using cluster or factor analyses, related to the risk of cardiovascular	Dietary pattern assessed using factor or cluster analysis HTN, BP, TG, LDL-C, HDL-C, incidence of CVD, CVD-related	22 22 PCS (from 18 cohorts)	Limited evidence from epidemiological studies indicates that dietary patterns, assessed using cluster or factor analysis, characterized by vegetables, fruits, whole grains, fish, and low-fat dairy products are associated with decreased risk of cardiovascular disease in adults. Evidence of a relationship between dietary patterns characterized by red and processed meat, sugar-sweetened foods and drinks, and fried foods and an increased risk of cardiovascular disease is limited and less consistent. (Limited)

disease?	death, MI, stroke		
What combinations of food intake, assessed using reduced rank regression, explain the most variation in risk of cardiovascular disease?	Dietary pattern assessed using reduced rank regression HTN, BP, TG, LDL-C, HDL-C, incidence of CVD, CVD-related death, MI, stroke	4 4 PCS	Insufficient evidence, due to a small number of studies, was available to examine the relationship between dietary patterns derived using reduced rank regression and risk of cardiovascular disease. The disparate nature of the methods used made it difficult to compare results, and therefore, no conclusions were drawn. (Grade not Assignable)
What is the relationship between adherence to dietary guidelines/ recommendations or specific dietary patterns, assessed using methods other than index/ score, cluster or factor, or reduced rank regression analyses, and risk of cardiovascular disease?	Dietary pattern assessed using methodologies other than index, factor, cluster, or reduced rank regression analyses HTN, BP, TG, LDL-C, HDL-C, incidence of CVD, CVD-related death, MI, stroke	20 14 RCT (from 8 trials) 6 PCS	There is strong and consistent evidence that consumption of a DASH diet results in reduced blood pressure in adults with above optimal blood pressure, up to and including stage 1 hypertension. A dietary pattern consistent with the DASH diet is rich in fruits, vegetables, low-fat dairy, fish, whole grains, fiber, potassium and other minerals at recommended levels, and low in red and processed meat, sugar-sweetened foods and drinks, saturated fat, cholesterol, and sodium. There is limited evidence that adherence to vegetarian diets is associated with decreased death from ischemic heart disease, with the association being stronger in men than in women. (Strong – DASH and BP; Limited – Vegetarian and IHD)
Lifestyle Interventions to Reduce Cardiovascular Risk: Systematic Evidence Review from the Lifestyle Work Group, (National Heart, Lung, and Blood Institute, 2013) **ACC/AHA Guideline on Lifestyle Management to Reduce Cardiovascular Risk (Eckel, 2013)**			
Overarching Finding/ Recommendation: Advise adults who would benefit from LDL-C or BP lowering to: • Consume a dietary pattern that emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, non-tropical vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red meats. • Adapt this dietary pattern to appropriate calorie requirements, personal and cultural food preferences, and nutrition therapy for other medical conditions (including diabetes mellitus). • Achieve this pattern by following plans such as the DASH dietary pattern, the USDA Food Pattern, or the AHA Diet.			
Among adults, what is the effect of dietary patterns and/or macronutrient composition on CVD risk factors, when compared to no treatment or to other types of interventions?	Mediterranean BP	4 1 PCS; 3 RCT	Counseling to eat a Mediterranean-style dietary pattern compared to minimal advice to consume a low-fat dietary pattern, in free-living middle-aged or older adults (with type 2 DM or at least three CVD risk factors) decreased BP by 6–7/2–3 mmHg. In an observational study of healthy younger adults, adherence to a Mediterranean-style dietary pattern was associated with decreased BP 2–3/1–2 mmHg. (Low)
	Mediterranean Lipids		Counseling to eat a Mediterranean-style dietary pattern compared to minimal or no dietary advice, in free-living middle aged or older adults (with or without CVD or at high risk for CVD) resulted in no consistent effect on plasma LDL-C, HDL-C, and TG; in part due to substantial differences and limitations in the studies. (Low)
	DASH BP	6 citations 2 RCT	When all food was supplied to adults with blood pressure 120–159/80–95 mmHg and both body weight and sodium intake were kept stable, the DASH dietary pattern, when compared to a typical American diet of the 1990s, decreased BP 5–6/3 mmHg. (High)
	DASH		When food was supplied to adults with a total cholesterol level <260 mg/dL, LDL-C <160 mg/dL, and body weight was

	Lipids		kept stable, the DASH dietary pattern, when compared to a typical American diet of the 1990s, decreased LDL-C by 11 mg/dL, decreased HDL-C by 4 mg/dL, and no effect on TG. (High)
	DASH BP in subpopulations		When food was supplied to adults with BP 120–159/80–95 mmHg and body weight was kept stable, the DASH dietary pattern, when compared with the typical American diet of the 1990s, decreased BP in women and men, African American and non-African Americans, older and younger adults, and hypertensive and non-hypertensive adults. (High)
	DASH Lipids in subpopulations		When all food was supplied to adults with a total cholesterol level <260 mg/dL, LDL-C <160 mg/dL, and body weight was kept stable, the DASH dietary pattern, as compared to a typical American diet of the 1990s, decreased LDL-C and decreased HDL-C similarly in subgroups: African American and non-African American, and hypertensive and non-hypertensive. (Low)
	DASH variation BP	1 1 RCT	In adults with BP of 120–159/80–95 mmHg, modifying the DASH dietary pattern by replacing 10% of calories from CHO with the same amount of either protein or unsaturated fat (8% MUFA and 2% PUFA) lowered systolic BP by 1 mmHg compared to the DASH dietary pattern. Among adults with BP 140–159/90–95 mmHg, these replacements lowered systolic BP by 3 mmHg relative to DASH. (Moderate)
	DASH variation Lipids		In adults with average baseline LDL-C 130 mg/dL, HDL-C 50 mg/dL, and TG 100 mg/dL, modifying the DASH dietary pattern by replacing 10% of calories from CHO with 10% of calories from protein decreased LDL-C by 3 mg/dL, decreased HDL-C by 1 mg/dL, and decreased TG by 16 mg/dL compared to the DASH dietary pattern. Replacing 10% of calories from CHO with 10% of calories from unsaturated fat (8% MUFA and 2% PUFA) decreased LDL-C similarly, increased HDL-C by 1 mg/dL, and decreased TG by 10 mg/dL compared to the DASH dietary pattern. (Moderate)
Sofi, 2013			
To investigate the association between the Mediterranean diet and risk and incidence of CVD Meta-analysis AMSTAR: 9/11	Mediterranean Mortality from and/or incidence of cardio- and cerebrovascular diseases	14 14 PCS	A 2-point increase of adherence to the Mediterranean diet was associated with a reduced risk of mortality and incidence of CVD (RR=0.90; 95% CI: 0.87 to 0.92; P<0.0001).
Martinez-Gonzalez, 2014			
To review the evidence on the association between adherence to a Mediterranean diet and the risk of CVD Meta-analysis AMSTAR: 9/11	Mediterranean Fatal or nonfatal clinical CVD event	13 (12 included in meta-analysis) 13 PCS	Each 2-point increment in a 0-9 Mediterranean diet score was associated with a 10% relative reduction in the risk of CVD (RR=0.90; 95% CI: 0.86 to 0.94).

Rees, 2013			
To determine the effectiveness of dietary advice to follow a Mediterranean-style dietary pattern or the provision of foods relevant to the Mediterranean diet for the primary prevention of CVD Systematic review and meta-analysis AMSTAR: 11/11	Mediterranean Cardiovascular mortality, non-fat endpoints (e.g., MI stroke), change in blood lipids and blood pressure	15 (11 trials) 11 RCT	The limited evidence to date suggests some favorable effects of the Mediterranean diet on cardiovascular risk factors. Clinical events were reported in only one trial where no statistically significant effects of the intervention were seen on fatal and non-fatal endpoints at eight years. Small reductions in total cholesterol (-0.16 mmol/L, 95% CI: -0.26 to -0.06) and LDL-C (-0.07 mmol/L, 95% CI: -0.13 to -0.01) were seen with the intervention. Subgroup analyses revealed statistically significant greater reductions in total cholesterol in those trials describing the intervention as a Mediterranean diet (-0.23 mmol/L, 95% CI: -0.27 to -0.2) compared with control (-0.06 mmol/L, 95% CI: -0.13 to 0.01). Heterogeneity precluded meta-analyses for other outcomes. Reductions in blood pressure were seen in three of five trials reporting this outcome.
Salehi-Abargouei, 2013			
To summarize and if possible quantify the longitudinal effects of a DASH-style diet on the incidence of CVDs Meta-analysis AMSTAR: 9/11	DASH-style Fatal or nonfatal CVDs, including CHD and stroke	7 (6 included in meta-analysis) 5 PCS; 1 RCT	A DASH-like diet can significantly reduce CVDs (RR=0.80; 95% CI: 0.74 to 0.86), CHD (RR=0.79; 95% CI: 0.71 to 0.88), and stroke (RR=0.81; 95% CI: 0.72 to 0.92). A linear and negative association was obtained between DASH-style diet concordance and all CVDs, as well.
Huang, 2012			
To investigate cardiovascular disease mortality among vegetarians and non-vegetarians Meta-analysis AMSTAR: 9/11	Vegetarian (lacto-ovo and vegan) Non-vegetarian Mortality from ischemic heart disease, circulatory diseases and cerebrovascular disease	7 7 PCS	Mortality from ischemic heart disease was significantly lower in vegetarians than in nonvegetarians (RR=0.71; 95% CI: 0.56 to 0.87). Authors observed a 16% lower mortality from circulatory diseases (RR=0.84; 95% CI: 0.54 to 1.14) and a 12% lower mortality from cerebrovascular disease (RR=0.88; 95% CI: 0.70 to 1.06) in vegetarians compared to non-vegetarians.
Yokoyama, 2014			

To conduct a systematic review and meta-analysis of controlled clinical trials and observational studies that have examined the association between vegetarian diets and BP Meta-analysis AMSTAR: 10/11	Vegetarian Systolic and diastolic BP	7 7 RCT	Consumption of vegetarian diets was associated with a reduction in mean systolic blood pressure (-4.8 mm Hg; 95% CI: -6.6 to -3.1; P<0.01) and diastolic blood pressure (-2.2 mm Hg; 95% CI: -3.5 to -1.0) compared with the consumption of omnivorous diets.

* A measurement tool for the 'assessment of multiple systematic reviews' (AMSTAR)

** Reference overlap: Of the 142 articles included in total across the reviews, 35 were included in two or more reviews. The greatest crossover was between Sofi and Martinez-Gonzalez, which included 12 of the same articles in meta-analyses (of 14 and 13 studies, respectively).

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16. Margetts BM, Beilin LJ, Armstrong BK, Vandongen R. A randomized control trial of a vegetarian diet in the treatment of mild hypertension. Clin Exp Pharmacol Physiol. 1985;12(3):263-6. PMID: 3896594. http://www.ncbi.nlm.nih.gov/pubmed/3896594.

17. Crowe FL, Appleby PN, Travis RC, Key TJ. Risk of hospitalization or death from ischemic heart disease among British vegetarians and nonvegetarians: results from the EPIC-Oxford cohort study. Am J Clin Nutr. 2013;97(3):597-603. PMID: 23364007. http://www.ncbi.nlm.nih.gov/pubmed/23364007.

18. Zamora D, Gordon-Larsen P, He K, Jacobs DR, Shikany JM, Popkin BM. Are the 2005 Dietary Guidelines for Americans Associated With reduced risk of type 2 diabetes and cardiometabolic risk factors? Twenty-year findings from the CARDIA study. Diabetes Care. 2011;34(5):1183-5. PMID: 21478463. http://www.ncbi.nlm.nih.gov/pubmed/21478463.

19. van de Laar RJ, Stehouwer CD, van Bussel BC, Prins MH, Twisk JW, Ferreira I. Adherence to a Mediterranean dietary pattern in early life is associated with lower arterial stiffness in adulthood: the Amsterdam Growth and Health Longitudinal Study. J Intern Med. 2013;273(1):79-93. PMID: 22809371. http://www.ncbi.nlm.nih.gov/pubmed/22809371.
20. Rumawas ME, Meigs JB, Dwyer JT, McKeown NM, Jacques PF. Mediterranean-style dietary pattern, reduced risk of metabolic syndrome traits, and incidence in the Framingham Offspring Cohort. Am J Clin Nutr. 2009;90(6):1608-14. PMID: 19828705. http://www.ncbi.nlm.nih.gov/pubmed/19828705.

21. Tortosa A, Bes-Rastrollo M, Sanchez-Villegas A, Basterra-Gortari FJ, Nuñez-Cordoba JM, Martinez-Gonzalez MA. Mediterranean diet inversely associated with the incidence of metabolic syndrome: the SUN prospective cohort. Diabetes Care. 2007;30(11):2957-9. PMID: 17712023. http://www.ncbi.nlm.nih.gov/pubmed/17712023.

22. Estruch R, Ros E, Martínez-González MA. Mediterranean diet for primary prevention of cardiovascular disease. N Engl J Med. 2013;369(7):676-7. PMID: 23944307. http://www.ncbi.nlm.nih.gov/pubmed/23944307.

23. Fung TT, Chiuve SE, McCullough ML, Rexrode KM, Logroscino G, Hu FB. Adherence to a DASH-style diet and risk of coronary heart disease and stroke in women. Arch Intern Med. 2008;168(7):713-20. PMID: 18413553. http://www.ncbi.nlm.nih.gov/pubmed/18413553.

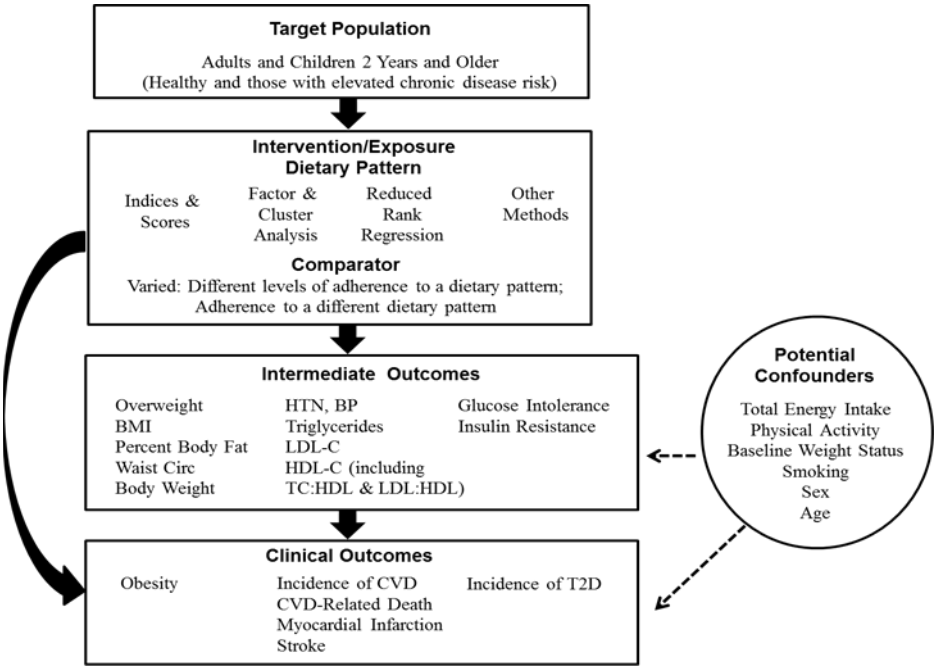
24. National Heart Lung and Blood Institute. Managing overweight and obesity in adults: Systematic evidence review from the Obesity Expert Panel, 2013. Bethesda, MD: U.S. Department of Health and Human Services, National Institutes of Health; 2013. Available from: http://www.nhlbi.nih.gov/guidelines/obesity/ser/index.htm.

    Associated Guideline
    Jensen MD, Ryan DH, Apovian CM, Ard JD, Comuzzie AG, Donato KA, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. J Am Coll Cardiol. 2014;63(25 Pt B):2985-3023. PMID: 24239920. http://www.ncbi.nlm.nih.gov/pubmed/24239920.

Supplementary Information:

*(**Note:** The search and update for the dietary patterns and CVD, body weight, and type 2 diabetes reviews were done simultaneously and are described together below.)*

Analytical Framework



Methodology

The questions examining dietary patterns and risk of CVD, obesity, and type 2 diabetes were answered using existing reports, systematic reviews, and meta-analyses. All three of these questions were addressed in the Nutrition Evidence Library (NEL) Dietary Patterns Systematic Review Project. This project was supported by USDA's Center for Nutrition Policy and Promotion and was informed by a Technical Expert Collaborative of experts in dietary patterns research.[1] Additionally, the DGAC reviewed reports from systematic reviews recently conducted by the National Heart, Lung, and Blood Institute (NHLBI) that included dietary patterns research. For CVD, the DGAC used the NHLBI *Lifestyle Interventions to Reduce Cardiovascular Risk: Systematic Evidence Review from the Lifestyle Work Group* and the associated American Heart Association (AHA)/ American College of Cardiology (ACC) *Guideline on Lifestyle Management to Reduce Cardiovascular Risk*.[2] For body weight, the DGAC used the NHLBI *Managing Overweight and Obesity in Adults: Systematic Evidence Review from the Obesity Expert Panel* and the associated AHA/ACC/ The Obesity Society (TOS) *Guideline for the Management of Overweight and Obesity in Adults*.[24] For all three questions, in an attempt to capture new research published since the searches for these systematic reviews were completed, the Committee considered existing systematic reviews and meta-analyses published in peer-reviewed journals since 2008. The existing systematic reviews and meta-analyses considered

by the DGAC had to meet the general inclusion criteria of the DGAC, and were required to consider dietary patterns and the outcomes of interest.

Search Strategy for Existing Systematic Reviews/Meta-Analyses

(“diet quality” OR dietary pattern* OR diet pattern* OR eating pattern* OR food pattern* OR eating habit* OR dietary habit* OR food habit* OR dietary profile* OR food profile* OR diet profile* OR eating profile* OR dietary guideline* OR dietary recommendation* OR food intake pattern* OR dietary intake pattern* OR diet pattern* OR eating style*) OR

(DASH OR (dietary approaches to stop hypertension) OR "Diet, Mediterranean"[Mesh] OR vegan* OR vegetarian* OR "Diet, Vegetarian"[Mesh] OR “prudent diet” OR “western diet” OR nordiet OR omniheart OR (Optimal Macronutrient Intake Trial to Prevent Heart Disease) OR ((Okinawa* OR "Ethnic Groups"[Mesh] OR “plant based” OR Mediterranean[tiab]OR Nordic) AND (diet[mh] OR diet[tiab] OR food[mh])))
OR
("Guideline Adherence"[Mesh] AND (diet OR food OR eating OR eat OR dietary OR feeding OR nutrition OR nutrient*)) OR (adherence AND (nutrient* OR nutrition OR diet OR dietary OR food OR eat OR eating) AND (guideline* OR guidance OR recommendation*)) OR
(dietary score* OR adequacy index* OR kidmed OR Diet Quality Index* OR Food Score* OR Diet Score* OR MedDietScore OR Dietary Pattern Score* OR “healthy eating index”)OR

((index*[ti] OR score*[ti] OR indexes OR scoring[ti] indices[ti]) AND (dietary[ti] OR nutrient*[ti] OR eating[tiab] OR OR food[ti] OR food[mh] OR diet[ti] OR diet[mh]) AND (pattern* OR habit* OR profile*))

Body weight:
("body size"[tiab] OR body size[mh] OR obesity[tiab] OR obese[tiab] OR obesity[mh] OR overweight [tiab] OR adiposity[tiab] OR adiposity[mh] OR "body weight"[tiab] OR body weight[mh] OR “body-weight related”[tiab] OR "weight gain"[tiab] OR weight gain[mh] OR "weight loss"[tiab] OR Body Weights and Measures[Majr] OR overweight[tiab] OR "Body Composition"[mh] OR "body fat"[tiab] OR adipos*[tiab] OR weight[ti] OR waist[ti] OR "Anthropometry"[Mesh:noexp] OR “body mass index”[tiab] OR BMI[tiab] OR “weight status”[tiab] OR adipose tissue [mh] OR "healthy weight"[tiab] OR waist circumference[mh] OR “body fat mass”[tiab] OR body weight changes[mh] OR “waist circumference”[tiab])

CVD:
"Mortality"[Mesh] OR mortality[tiab] OR "blood pressure"[tiab] OR "blood pressure"[mesh] OR "cardiovascular diseases"[mh:noexp] OR cardiovascular disease*[tiab] OR cardiovascular event*[tiab] OR "cholesterol/blood"[mh] OR "Cholesterol, HDL"[Mesh] OR cholesterol[tiab] OR "Cholesterol, Dietary"[Mesh] OR triglyceride* OR stroke[tiab] OR "stroke"[Mesh] OR "Lipids/blood"[Mesh] OR hypertension[tiab] OR "Myocardial Infarction"[Mesh] OR "Myocardial Infarction"[tiab] OR "Heart Failure"[Mesh] OR "Heart Arrest"[Mesh] OR "Myocardial

Ischemia"[Mesh] OR "heart failure"[tiab] OR "heart arrest"[tiab] OR "Myocardial Ischemia"[tiab] OR hypertension[mh]

T2D:
("insulin resistance"[mh] OR "insulin"[ti] OR inflammation[ti] OR glucose intoleran*[ti] OR "Glucose Intolerance"[Mesh] OR diabetes[ti] OR "Diabetes Mellitus, Type 2"[Mesh] OR "Hemoglobin A, Glycosylated"[Mesh] OR "hemoglobin A1c "[ti] OR ("impaired fasting" AND (glucose OR glycemi*)) OR "onset diabetes" OR "impaired glucose" OR "insulin sensitivity")

AND limit to: systematic[sb] OR systematic review* OR meta-analys* OR meta analys*

Inclusion Criteria

Date Range:
- Published between January 2008 and April 2014 (in English in a peer-reviewed journal)

Study Design:
- Systematic review and/or meta-analysis that included randomized controlled trials and/or prospective cohort studies

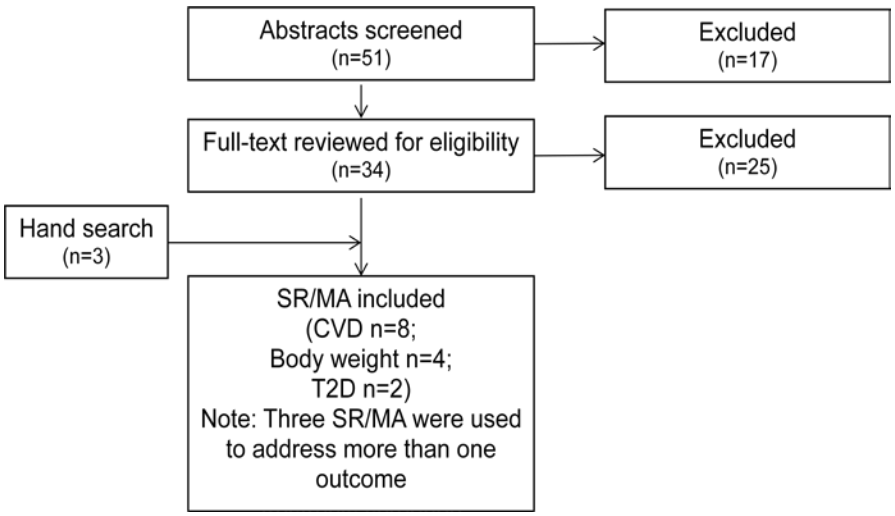
Study Subjects:
- Reviews that included studies from high or very high human development (2012 Human Development Index)
- Healthy or at elevated chronic disease risk

Intervention/Exposure:
- Dietary pattern - The quantities, proportions, variety, or combination of different foods, drinks, and nutrients (when available) in diets, and the frequency with which they are habitually consumed.

Outcome:
- CVD: LDL-cholesterol, HDL-cholesterol, triglycerides, blood pressure, incidence of CVD, CVD-related death, myocardial infarction, or stroke
- Body weight: Body mass index, body weight, percent body fat, waist circumference, incidence of overweight or obesity
- Type 2 diabetes: Glucose intolerance, insulin resistance, or incidence of type 2 diabetes

Quality:
- Reviews rated 8-11 on AMSTAR (A measurement tool for the 'assessment of multiple systematic reviews')

Search Results



Excluded Articles with Reason for Exclusion

25. Ajala O, English P, Pinkney J. Systematic review and meta-analysis of different dietary approaches to the management of type 2 diabetes. Am J Clin Nutr. 2013 Mar;97(3):505-16. doi: 10.3945/ajcn.112.042457. Epub 2013 Jan 30. Review. PubMed PMID: 23364002. EXCLUDE: Examined subjects diagnosed with type 2 diabetes (management of type 2 diabetes)

26. Akesson A, Andersen LF, Kristjánsdóttir AG, Roos E, Trolle E, Voutilainen E, Wirfält E. Health effects associated with foods characteristic of the Nordic diet: a systematic literature review. Food Nutr Res. 2013;57. doi: 10.3402/fnr.v57i0.22790. Review. PubMed PMID: 24130513; PubMed Central PMCID: PMC3795297. EXCLUDE: Examined individual components of the diet, not dietary patterns as defined by the Subcommittee

27. Aljadani H., Patterson A., Sibbritt D., Collins C. The association between dietary patterns and weight change in adults over time: A systematic review of studies with follow up. JBI Database of Systematic Reviews and Implementation Reports 2013 11:8 (272-316) EXCLUDE: Did not examine dietary patterns as defined by the Subcommittee

28. Al-Khudairy L, Stranges S, Kumar S, Al-Daghri N, Rees K. Dietary factors and type 2 diabetes in the Middle East: what is the evidence for an association?--a systematic review. Nutrients. 2013 Sep 26;5(10):3871-97. doi: 10.3390/nu5103871. PubMed PMID: 24077241; PubMed Central PMCID: PMC3820049. EXCLUDE: Not all countries in the Middle East are of high or very high development according to the Human Development Index

29. Barbaresko J, Koch M, Schulze MB, Nöthlings U. Dietary pattern analysis and biomarkers of low-grade inflammation: a systematic literature review. Nutr Rev. 2013 Aug;71(8):511-27. doi: 10.1111/nure.12035. Epub 2013 Jun 13. Review. PubMed PMID: 23865797. EXCLUDE: Outcomes were inflammatory markers, which were not included as intermediate outcomes in the Subcommittee's analytical framework

30. Buckland G, Bach A, Serra-Majem L. Obesity and the Mediterranean diet: a systematic review of observational and intervention studies. Obes Rev. 2008 Nov;9(6):582-93. doi: 10.1111/j.1467-789X.2008.00503.x. Epub 2008 Jun 10. Review. PubMed PMID: 18547378 EXCLUDE: AMSTAR rating was 7 of 11

31. Carter P, Achana F, Troughton J, Gray LJ, Khunti K, Davies MJ. A Mediterranean diet improves HbA1c but not fasting blood glucose compared to alternative dietary strategies: a network meta-analysis. J Hum Nutr Diet. 2013 Jun 22. doi: 10.1111/jhn.12138. [Epub ahead of print] PubMed PMID: 23790149. EXCLUDE: Half of the studies included in the meta-analyses only included participants with T2D or CVD

32. Chan M.Y., Yulianna Y. Effect of mediterranean diet components on selected cardiovascular risk factors, all-cause mortality and cardiovascular mortality: Systematic review. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (1093) EXCLUDE: Abstract, not a full article

33. Defagó M., Elorriaga N., Irazola V., Rubinstein A.Association between food patterns and biomarkers of endothelial function: A systematic review. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (1282) EXCLUDE: Outcomes were biomarkers of endothelial function, which were not included as intermediate outcomes in the Subcommittee's analytical framework

34. Dong JY, Zhang ZL, Wang PY, Qin LQ. Effects of high-protein diets on body weight, glycaemic control, blood lipids and blood pressure in type 2 diabetes: meta-analysis of randomised controlled trials. Br J Nutr. 2013 Sep 14;110(5):781-9. doi: 10.1017/S0007114513002055. Epub 2013 Jul 5. Review. PubMed PMID: 23829939. EXCLUDE: Participants were diagnosed with type 2 diabetes

35. Esposito K, Kastorini CM, Panagiotakos DB, Giugliano D. Mediterranean diet and metabolic syndrome: an updated systematic review. Rev Endocr Metab Disord. 2013 Sep;14(3):255-63. doi: 10.1007/s11154-013-9253-9. PubMed PMID: 23982678. EXCLUDE: Included cross-sectional studies; examined incidence of metabolic syndrome, which is outside the scope of the Subcommittee's analytical framework

36. Esposito K, Kastorini CM, Panagiotakos DB, Giugliano D. Prevention of type 2 diabetes by dietary patterns: a systematic review of prospective studies and meta-analysis. Metab Syndr Relat Disord. 2010 Dec;8(6):471-6. doi: 10.1089/met.2010.0009. Epub 2010 Oct 19. Review. PubMed PMID: 20958207. EXCLUDE: Of the 10 included studies, 8 were included in the NEL and Alhamzi reviews being considered by the Committee

37. Esposito K, Maiorino MI, Ceriello A, Giugliano D. Prevention and control of type 2 diabetes by Mediterranean diet: a systematic review. Diabetes Res Clin Pract. 2010 Aug;89(2):97-102. doi: 10.1016/j.diabres.2010.04.019. Epub 2010 May 23. Review. PubMed PMID: 20546959. EXCLUDE: Only 3 studies looked at prevention and one was cross-sectional

38. Grosso G, Mistretta A, Frigiola A, Gruttadauria S, Biondi A, Basile F, Vitaglione P, D'Orazio N, Galvano F. Mediterranean diet and cardiovascular risk factors: a systematic review. Crit Rev Food Sci Nutr. 2014;54(5):593-610. doi: 10.1080/10408398.2011.596955. PubMed PMID: 24261534. EXCLUDE: Included cross-sectional studies; included various outcomes

not included in the Subcommittee's analytical framework, including incidence of metabolic syndrome, CRP, IL-6, liver transaminases, etc.

39. Hu T, Mills KT, Yao L, Demanelis K, Eloustaz M, Yancy WS Jr, Kelly TN, He J, Bazzano LA. Effects of low-carbohydrate diets versus low-fat diets on metabolic risk factors: a meta-analysis of randomized controlled clinical trials. Am J Epidemiol. 2012 Oct 1;176 Suppl 7:S44-54. doi: 10.1093/aje/kws264. PubMed PMID: 23035144; PubMed Central PMCID: PMC3530364. EXCLUDE: Did not examine dietary patterns as described by the Subcommittee

40. Joung H, Hong S, Song Y, Ahn BC, Park MJ. Dietary patterns and metabolic syndrome risk factors among adolescents. Korean J Pediatr. 2012 Apr;55(4):128-35. doi: 10.3345/kjp.2012.55.4.128. Epub 2012 Apr 30. PubMed PMID: 22574073; PubMed Central PMCID: PMC3346835. EXCLUDE: Meta-analysis of cross-sectional data

41. Kant AK. Dietary patterns: biomarkers and chronic disease risk. Appl Physiol Nutr Metab. 2010 Apr;35(2):199-206. doi: 10.1139/H10-005. Review. PubMed PMID: 20383233. EXCLUDE: Narrative review

42. Kastorini CM, Milionis HJ, Esposito K, Giugliano D, Goudevenos JA, Panagiotakos DB. The effect of Mediterranean diet on metabolic syndrome and its components: a meta-analysis of 50 studies and 534,906 individuals. J Am Coll Cardiol. 2011 Mar 15;57(11):1299-313. doi: 10.1016/j.jacc.2010.09.073. PubMed PMID: 21392646. EXCLUDE: Included cross-sectional studies

43. Kastorini CM, Milionis HJ, Goudevenos JA, Panagiotakos DB. Mediterranean diet and coronary heart disease: is obesity a link? - A systematic review. Nutr Metab Cardiovasc Dis. 2010 Sep;20(7):536-51. doi: 10.1016/j.numecd.2010.04.006. Review. PubMed PMID: 20708148. EXCLUDE: Included cross-sectional studies and secondary prevention studies

44. Kastorini CM, Panagiotakos DB. Dietary patterns and prevention of type 2 diabetes: from research to clinical practice; a systematic review. Curr Diabetes Rev. 2009 Nov;5(4):221-7. Review. PubMed PMID: 19531025. EXCLUDE: Included cross-sectional and case-control studies

45. Kwan MW, Wong MC, Wang HH, Liu KQ, Lee CL, Yan BP, Yu CM, Griffiths SM. Compliance with the Dietary Approaches to Stop Hypertension (DASH) diet: a systematic review. PLoS One. 2013;8(10):e78412. doi: 10.1371/journal.pone.0078412. PubMed PMID: 24205227; PubMed Central PMCID: PMC3813594. EXCLUDE: Examined compliance to the DASH diet

46. Maghsoudi Z, Azadbakht L. How dietary patterns could have a role in prevention, progression, or management of diabetes mellitus? Review on the current evidence. J Res Med Sci. 2012 Jul;17(7):694-709. PubMed PMID: 23798934; PubMed Central PMCID: PMC3685790. EXCLUDE: Included cross-sectional studies and seminars and symposiums

47. Marshall S, Burrows T, Collins CE. Systematic review of diet quality indices and their associations with health-related outcomes in children and adolescents. J Hum Nutr Diet. 2014 Feb 13. doi: 10.1111/jhn.12208. [Epub ahead of print] PubMed PMID: 24524271. EXCLUDE: Included cross-sectional and case-control studies; included abstracts; focus of

review was to describe indices being used with children and adolescents – only brief mention of body weight and no conclusions drawn.

48. Martínez-González MÁ, Martín-Calvo N. The major European dietary patterns and metabolic syndrome. Rev Endocr Metab Disord. 2013 Sep;14(3):265-71. doi: 10.1007/s11154-013-9264-6. PubMed PMID: 23979531. EXCLUDE: Narrative review

49. McEvoy C., Cardwell C., Woodside J., Young I., Hunter S., McKinley M. A systematic review and meta-analysis examining 'a posteriori' dietary patterns and risk of type 2 diabetes. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (864) EXCLUDE: Abstract, not a full article

50. Mente A, de Koning L, Shannon HS, Anand SS. A systematic review of the evidence supporting a causal link between dietary factors and coronary heart disease. Arch Intern Med. 2009 Apr 13;169(7):659-69. doi:10.1001/archinternmed.2009.38. Review. PubMed PMID: 19364995. EXCLUDE: Some studies included secondary prevention, did not provide list of included articles; describes dietary factors, rather than dietary pattern as defined by the SC

51. Nordmann A.J., Suter K., Tuttle K.R., Estruch R., Shai I., Bucher H. Meta-analysis of Mediterranean versus low-fat diets to improve cardiovascular risk factors. European Heart Journal 2010 31 SUPPL. 1 (940) EXCLUDE: Abstract, not a full article

52. Osei-Assibey G, Boachie C. Dietary interventions for weight loss and cardiovascular risk reduction in people of African ancestry (blacks): a systematic review. Public Health Nutr. 2012 Jan;15(1):110-5. doi: 10.1017/S1368980011001121. Epub 2011 Jun 1. Review. PubMed PMID: 21729478. EXCLUDE: Examined dietary interventions, in general, not dietary patterns specifically

53. Psaltopoulou T, Sergentanis TN, Panagiotakos DB, Sergentanis IN, Kosti R, Scarmeas N. Mediterranean diet, stroke, cognitive impairment, and depression: A meta-analysis. Ann Neurol. 2013 Oct;74(4):580-91. doi: 10.1002/ana.23944. Epub 2013 Sep 16. PubMed PMID: 23720230. EXCLUDE: Included case-control studies

54. Santos FL, Esteves SS, da Costa Pereira A, Yancy WS Jr, Nunes JP. Systematic review and meta-analysis of clinical trials of the effects of low carbohydrate diets on cardiovascular risk factors. Obes Rev. 2012 Nov;13(11):1048-66. doi: 10.1111/j.1467-789X.2012.01021.x. Epub 2012 Aug 21. Review. PubMed PMID: 22905670. EXCLUDE: Did not examine dietary patterns as described by the SC

55. Schwingshackl L, Hoffmann G. Long-term effects of low-fat diets either low or high in protein on cardiovascular and metabolic risk factors: a systematic review and meta-analysis. Nutr J. 2013 Apr 15;12:48. doi: 10.1186/1475-2891-12-48. Review. PubMed PMID: 23587198; PubMed Central PMCID: PMC3636027. EXCLUDE: Did not examine dietary patterns as described by the SC

56. Shirani F, Salehi-Abargouei A, Azadbakht L. Effects of Dietary Approaches to Stop Hypertension (DASH) diet on some risk for developing type 2 diabetes: a systematic review and meta-analysis on controlled clinical trials. Nutrition. 2013 Jul-Aug;29(7-8):939-47. doi:

10.1016/j.nut.2012.12.021. Epub 2013 Mar 6. Review. PubMed PMID: 23473733. EXCLUDE: Review included articles with less than 30 participants per study arm

57. Smithers LG, Golley RK, Brazionis L, Lynch JW. Characterizing whole diets of young children from developed countries and the association between diet and health: a systematic review. Nutr Rev. 2011 Aug;69(8):449-67. doi: 10.1111/j.1753-4887.2011.00407.x. Review. PubMed PMID: 21790612. EXCLUDE: Included cross-sectional studies; focus of the review was to describe what is currently known about measures of dietary patterns in early life and the general association between dietary patterns and child health and development – only brief mention of body weight

58. Sofi F, Abbate R, Gensini GF, Casini A. Accruing evidence on benefits of adherence to the Mediterranean diet on health: an updated systematic review and meta-analysis. Am J Clin Nutr. 2010 Nov;92(5):1189-96. doi: 10.3945/ajcn.2010.29673. Epub 2010 Sep 1. Review. PubMed PMID: 20810976. EXCLUDE: Meta-analysis captured in Sofi 2013

59. Sofi F, Cesari F, Abbate R, Gensini GF, Casini A. Adherence to Mediterranean diet and health status: meta-analysis. BMJ. 2008 Sep 11;337:a1344. doi: 10.1136/bmj.a1344. Review. PubMed PMID: 18786971; PubMed Central PMCID: PMC2533524. EXCLUDE: Meta-analysis captured in Sofi 2013

60. Sofi F. The Mediterranean diet revisited: evidence of its effectiveness grows. Curr Opin Cardiol. 2009 Sep;24(5):442-6. doi: 10.1097/HCO.0b013e32832f056e. Review. PubMed PMID: 19550306. EXCLUDE: Narrative review

61. Summerbell CD, Douthwaite W, Whittaker V, Ells LJ, Hillier F, Smith S, Kelly S, Edmunds LD, Macdonald I. The association between diet and physical activity and subsequent excess weight gain and obesity assessed at 5 years of age or older: a systematic review of the epidemiological evidence. Int J Obes (Lond). 2009 Jul;33 Suppl 3:S1-92. doi: 10.1038/ijo.2009.80. Review. Erratum in: Int J Obes (Lond). 2010 Apr;34(4):789. abstract no. 5.3 only. Int J Obes (Lond). 2010 Apr;34(4):788. abstract no. 5.2 only. PubMed PMID: 19597430. EXCLUDE: Considered various aspects of eating, including fast food intake, frequency of eating, night eating, individual food groups, as well as physical activity, etc.; included relevant section with 6 studies, 1 considered glycemic index/load, and 4 included in NEL review

62. Tyrovolas S, Panagiotakos DB. The role of Mediterranean type of diet on the development of cancer and cardiovascular disease, in the elderly: a systematic review. Maturitas. 2010 Feb;65(2):122-30. doi: 10.1016/j.maturitas.2009.07.003. Epub 2009 Aug 4. Review. PubMed PMID: 19656644. EXCLUDE: Narrative review; considers cross-sectional and case-control studies

63. Vadiveloo M, Dixon LB, Parekh N. Associations between dietary variety and measures of body adiposity: a systematic review of epidemiological studies. Br J Nutr. 2013 May;109(9):1557-72. doi: 10.1017/S0007114512006150. Epub 2013 Feb 27. Review. PubMed PMID: 23445540. EXCLUDE: Examined dietary variety, not dietary patterns

64. Wheeler ML, Dunbar SA, Jaacks LM, Karmally W, Mayer-Davis EJ, Wylie-Rosett J, Yancy WS Jr. Macronutrients, food groups, and eating patterns in the management of diabetes: a systematic review of the literature, 2010. Diabetes Care. 2012 Feb;35(2):434-45. doi:

10.2337/dc11-2216. Review. PubMed PMID: 22275443; PubMed Central PMCID: PMC3263899. EXCLUDE: Only included studies with people with type 2 diabetes

65. Yuliana Y., Chan M.Y. Effect of mediterranean diet components on selected cardiovascular risk factors, all-cause mortality and cardiovascular mortality: Systematic review. Annals of Nutrition and Metabolism 2013 63 SUPPL. 1 (981) EXCLUDE: Abstract, not a full article

66. Zhang Z, Wang J, Chen S, Wei Z, Li Z, Zhao S, Lu W. Comparison of Vegetarian Diets and Omnivorous Diets on Plasma Level of HDL-c: A Meta-Analysis. PLoS One. 2014 Mar 26;9(3):e92609. doi: 10.1371/journal.pone.0092609. eCollection 2014.PubMed PMID: 24671216. EXCLUDE: Included cross-sectional studies in meta-analysis