



Question: What is the relationship between dietary patterns and risk of depression?

Table 3. Summary of studies examining the relationship between dietary patterns and risk of depression

Study Design (Risk of Bias) Study Country	Sample Size Cases Study Duration Age Gender	Dietary Patterns	Results for Depression	Summary of Findings
General Population (Sorted by pattern method)				
Sanchez-Villegas, 2013 Randomized Controlled Trial (RCT) (Risk of Bias: 4/28) Prevención con Dieta Mediterránea (PREDIMED) Study Spain	Final N=3,923 (Attrition=47.3%) Cases: 224 Intervention: 5.4y Age: 67.1y (SD=6.2) 51.1% female	Mediterranean diet with nuts supplemented Mediterranean Diet with olive oil supplemented Low-Fat control diet	Diet group assignment not associated with risk of depression in the full sample.	No significant decrease in depression risk among participants at high risk of CVD assigned to MD supplemented with either nuts or EVOO. There was a significant risk reduction among a diabetic subsample.
Torres, 2012 RCT (Risk of Bias: 9/28) Meat and Livestock Australia funded trial Australia	Final N=95 (Attrition=14.4%) Cases: N/A Intervention: 14 wk Age: 59.3y (SD=5.1) 100% female	Vitality Diet Healthy Diet	Change in depression scores compared to baseline: <i>"Vitality Diet"</i> : Change -1.1, P<0.01 <i>"Healthy Diet"</i> : Change -0.6, P<0.01 Difference in depression scores between diets: NS	In a sample of postmenopausal women residing in the community, participating in a dietary intervention study to decrease BP, no significant between diet differences in depression were found. Both diets improved depression scores compared to baseline.
Index/Score Analysis				



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Akbaraly, 2013 Prospective Cohort Study (PCS) (Risk of Bias: 2/24) Whitehall II study UK	N=4,215 Cases: 260 Follow-up: 5y Age: 59.5y (SD=5.9) 25.3% female	Alternative Healthy Eating Index	AHEI score and depression (referent group: AHEI tertile 1) <i>Men:</i> NS [OR 0.95; no harmful signal] <i>Women:</i> OR=0.36 (95% CI=0.20-0.64; P for trend <0.001)	Adherence to healthy dietary recommendations measured by the AHEI reduced the likelihood of developing recurrent depression in women, but not in men.
Psaltopoulou, 2008 PCS (Risk of Bias: 5/24) EPIC Greece	N=732 Cases: NR Follow-up: 6.4–12.6y Age: >60y 64.9% female	Mediterranean diet score	There were no significant associations between adherence to the Mediterranean diet and depression. [PUFA (linoleic acid) and seed oil significant harm. Medi trended non-sig benefit]	Adherence to the Mediterranean diet was not associated with depression.
Sanchez-Villegas, 2009 Pro. Cohort (Risk of Bias: 2/24) Seguimiento University of Navarra Follow-up (SUN) Cohort Spain	N=10,094 Cases: 480 Follow-up: 4.4y Age: ~37y 58.5% female	Mediterranean dietary pattern (MDP)	Mediterranean diet pattern (MDP) score and risk of depression: MDP Score 6-9 (referent: score 0-2): <i>Model 1:</i> HR=0.58 (95% CI=0.44-0.77; P for trend <0.001) <i>Model 2:</i> HR=0.50 (95% CI=0.33-0.74; P for trend <0.001) <i>Model 3:</i> HR=0.69 (95% CI=0.50-0.96; P for trend =0.007).	An inverse association between adherence to the MDP and the risk of self-reported clinical depression has been found in this longitudinal analysis of the SUN cohort.
Shatenstein, 2012	N=1,488	Canadian Healthy Eating Index (C-HEI)	There were no significant associations between the Canadian Healthy Eating Index and depression	Adherence to the Canadian Food Guide was not associated with depression.



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Pro. Cohort (Risk of Bias: 6/24) NuAge Study Canada	Cases: NR Follow-up: 3y Age: 74y (SD=4) 52.6% female		(NS).	
Skarupski, 2013 Pro. Cohort (Risk of Bias: 2/24) Chicago Health and Aging Project (CHAP) US	N=3,502 Cases: 987 (Some overlap possible, but NR) Follow-up: 7.2y Age: 73.5y 59% female	Mediterranean-based diet (Med Diet) score	Med Diet Score and depressive symptoms: <i>Poisson regression estimate= -0.002, P=0.02</i> Med Diet Score and Center for Epidemiologic Studies Depression Scale Sum (CESDSUM) score: <i>Tertile 2 v (Ref: Tertile 1): NS</i> <i>Tertile 3 v (Ref: Tertile 1): Longitudinal effect =-0.03; SE=0.01; P<0.001</i>	Med Diet Score was inversely associated with risk of developing depressive symptoms in the adjusted models. Persons in Tertile 1 had the highest rate of developing depressive symptoms over time. The slope for persons in Tertile 2 was not as steep as for Tertile 1. The slope for persons in Tertile 3 was almost flat indicating a very low occurrence of depressive symptoms.
Factor and Principle Components Analysis				
Akbaraly, 2009 Pro. Cohort Study (Risk of Bias: 2/24) Whitehall II study UK	N=3,059 Cases: 416 Follow-up: 5y Age: 55.6y (SD=6.0) 26.2% female	Principal component analysis: Whole Food Processed Food	Whole food: <i>Tertile 3 (Referent: tertile 1): OR=0.73 (95% CI=0.51–1.02); P for trend=0.07; NS.</i> Processed food: <i>Tertile 3 (Referent: tertile 1): OR=1.69 (95% CI=1.10–2.60); P for trend=0.02).</i>	When excluding those with baseline depression some associations between dietary patterns and depression risk were seen. The "Processed food" pattern was associated with increased risk of depression. The "Whole food" pattern was not significantly associated with depression risk in fully adjusted models comparing tertile 3 to tertile 1; however tertile 2 vs. tertile 1 was associated with reduced risk.



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Chan, 2014 Pro. Cohort (Risk of Bias: 4/26) Hong Kong	N=2,211 Cases: 81 Follow-up: 4y Age: 72y (SD=5) ~40% female	Factor analysis Vegetables-Fruits Snacks-Drinks-Milk Meat-Fish	Diet and risk of depression. None of the dietary patterns identified were associated with depressive symptoms (NS).	Over 4 years, none of the dietary patterns identified (Vegetables-Fruits; Snacks-Drinks-Milk; Meat-Fish) were associated with development of depressive symptoms.
Chocano-Bedoya, 2013 Pro. Cohort (Risk of Bias: 0/24) National Health Survey (NHS) US	N=50,605 Cases: 3,002 (Strict definition); 7,413 (Broad definition) Follow-up: 12y Age: 62.3y (SD=6.9) 100% female	Principal components analysis Prudent Western	Diet and risk of depression Strict definition of depression (referent group: quintile 1): <i>Western pattern (Q5): NS</i> <i>Prudent pattern (Q5): NS</i> Broad definition (referent group: quintile 1): <i>Western pattern (Q5): NS</i> <i>Prudent pattern (Q5): NS</i>	Over the 12 years of follow-up there were no significant associations between prudent and Western pattern scores and depression risk defined broadly or strictly.
Jacka, 2014 Pro. Cohort (Risk of Bias: 5/24) Personality and Total Health (PATH) Through Life Study Australia	N=3,663 Cases: 343 Follow-up: 8y Age: 20-24y; 40-44y; 60-64y 55.6% female	Principle components analysis Prudent Western	Dietary pattern and depressive symptoms Age 20-24y at baseline: <i>Western: NS</i> <i>Prudent: NS</i> Age 40-44y at baseline: <i>Western: NS</i>	The lowest tertile of "Prudent" dietary pattern was associated with an increased likelihood of depressive symptoms in the older age group (60-64y at baseline). The highest tertile of "Western" dietary pattern was associated with increased likelihood of depressive symptoms in the oldest group until CVD risk factors were included in the model. No associations were seen for the 20-24y and 40-44y age groups in



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			<i>Prudent:</i> NS Age 60-64y at baseline: <i>Western:</i> NS <i>Prudent:</i> IRR=1.18 (95% CI=1.01-1.39)	multivariate models.
Le Port, 2012 Pro. Cohort (Risk of Bias: 3/24) French occupational GAZEL cohort (among electrical workers) France	N=12,404 Cases: 14.2-27.2% prevalence rate (some overlap possible, but NR) Follow-up: 10y Age: Male: 45.0y (SD=2.9); female: 42.2y (SD=4.2) 25.2% female	Principal Component Analysis: <i>Men, 5 patterns:</i> Low-fat Healthy diet Western diet Fat-sweet High snacking pattern <i>Women, 6 patterns:</i> Low-fat Healthy diet Traditional diet Animal protein pattern High dessert High snacking pattern	High adherence to dietary patterns (referent group: Quartile 1) and depression Men (quartile 4) <i>Low fat:</i> OR=1.16 (95% CI=1.02-1.31); P for trend <0.01 <i>Healthy diet:</i> OR=0.72 (95% CI=0.63-0.83); P for trend <0.001 <i>Western diet:</i> OR=1.36 (95% CI=1.19-1.54); P for trend <0.01 <i>Fat-sweet:</i> OR=1.49 (95% CI=1.30-1.71); P for trend <0.001 <i>Snacking:</i> OR=1.50 (95% CI=1.32-1.71); P for trend <0.001 Women (quartile 4) <i>Low fat:</i> OR=1.39 (95% CI=1.22-1.73); P for trend<0.01 <i>Healthy diet:</i> OR=0.75 (95% CI=0.61-0.93); P for trend<0.001 <i>Traditional diet:</i> OR=0.63 (95% CI=0.50-0.80); P for trend<0.001 <i>Snacking:</i> OR=1.43 (95% CI=1.16-1.76); P for trend<0.01 <i>Animal protein:</i> NS	Low-fat, western, fat-sweet, and snacking patterns were associated with increased likelihood of depression. In both sexes a healthy pattern, and a traditional pattern in women, was found to be associated with a lower likelihood of depressive symptoms. There may be a reverse causality effect for these patterns. Finally, associations between high quartiles of healthy and unhealthy patterns and symptoms of depression remain stable over a period of 10 years.



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			<i>Dessert: NS</i>	
Rienks, 2013 Pro. Cohort (Risk of Bias: 2/24) Australian Longitudinal Study on Women's Health Australia	N=4,662 Cases: 873 Follow-up: 3y Age: 50-55y 100% female	Factor analysis: Cooked vegetables Fruit Mediterranean style Meat and processed meat Dairy High fat and sugar	Association between dietary pattern at baseline and incident depressive symptoms (CESDS=10) at 3y follow-up: <i>Cooked vegetables: NS</i> <i>Fruit: NS</i> <i>Mediterranean style: OR=0.83 (95% CI=0.75-0.93; P<0.002)</i> <i>Processed meat: NS</i> <i>Dairy: NS</i> <i>High fat and sugar: NS</i>	A Mediterranean dietary pattern was associated with reduced risk of depression. None associations found for other dietary patterns in multivariate analysis.
Ruusunen, 2014 Pro. Cohort (Risk of Bias: 4/24) Kuopio Ischemic Heart Disease Risk Factor Study Finland	N=1,003 Cases: 28 Follow-up: 16.5y Age: 46-65y 0% female	Factor analysis: Prudent Western Mixed	Dietary Pattern and risk of physician-diagnosed depression: <i>Prudent: HR=0.66 (95% CI=0.47-0.93, P=0.018)</i> <i>Western: NS</i> <i>Mixed: NS</i>	In prospective analysis, a prudent dietary pattern was associated with reduced risk of hospitalization with physician diagnosed depression, while the other dietary patterns were not associated.
Reduced Rank Regression				
Lucas, 2014 Pro. Cohort (Risk of Bias: 0/24) NHS	N=43,685 Cases: 2,594 (Strict definition); 6,446 (Broad definition) Follow-up: 12y	Reduced-rank regression: Inflammatory Dietary Pattern	Inflammatory Dietary Pattern and risk of depression (referent: quintile 1) <i>Broad definition of depression: RR=1.29 (95% CI=1.18-1.41; P for trend<0.001)</i> <i>Strict definition of depression: RR=1.41 (1.22-1.63; P for trend<0.001)</i>	The inflammatory dietary pattern is associated with a higher depression risk using both broad and strict definitions of depression.



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US	Age: 50–77y 100% female			
Special Populations (Sorted by population)				
Postpartum				
Chatzi, 2011 Pro. Cohort (Risk of Bias: 2/24) Rhea Cohort Greece	N=529 Cases: 74 Follow-up: ~2.5y Age: >20y 100% female	Principal components analysis: Western diet Health conscious diet	Dietary patterns during pregnancy and postpartum depression score (referent: dietary pattern tertile 1) <i>Western pattern (tertile 2): NS</i> <i>Western pattern (tertile 3): NS</i> <i>Healthy pattern (tertile 2): $\beta=-1.13$ (95% CI=-2.25-0.00; P=0.049)</i> <i>Healthy pattern (tertile 3): $\beta=-1.75$ (95% CI=-3.22 to -0.28; P=0.020)</i> Dietary patterns during pregnancy and risk of high postpartum depression (referent: dietary pattern tertile 1) <i>Western pattern (tertile 2): NS</i> <i>Western pattern (tertile 3): NS</i> <i>Healthy pattern (tertile 2): RR=0.52 (95% CI=0.30-0.92; P=0.026)</i> <i>Healthy pattern (tertile 3): NS</i>	High adherence to a health conscious diet (vegetables, fruit, nuts, pulses, fish and seafood, olive oil and dairy product) was associated with lower EDPS scores. Western diet was not associated with risk of postpartum depression.
Okubo, 2011 Pro. Cohort (Risk of Bias: 3/24) Osaka Maternal and	N=865 Cases: 121 Follow-up: 17 months	Factor analysis: Healthy Western	No significant associations between dietary patterns and risk of postpartum depression (Other than western pattern Q1 vs. Q2) Western quartile 1 vs. quartile 2, Model 2; multivariate OR=0.52 (95% CI=0.30-0.93; P for	This prospective study in Japanese women failed to substantiate clear exposure–response relationships of dietary patterns with the subsequent risk of postpartum depression, although the second quartile of the Western pattern was associated with a



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Child Health Study (OMCHS) Japan	Age: 29.9y (SD=4.0) 100% female	Japanese	trend =0.36)	lower risk of postpartum depression
Vilela, 2014 Pro. Cohort (Risk of Bias: 2/26) Brazil	N=248 Cases: N/A Follow-up: ~9 months Age: 26.7y (20-40y) 100% female	Principle components analysis: Common Brazilian Healthy Processed	The “Healthy” pattern was inversely associated with depressive symptoms during pregnancy ($\beta = -0.723$, 95% CI=-1.277, -0.169; P=0.011). “Common Brazilian,” “Processed”: No associations with depressive symptoms during pregnancy (NS).	A “Healthy” dietary pattern (dairy products, fruits, fruit juices, green vegetables, legumes, candies, fish, cakes, cookies/crackers, noodles, pasta, roots, tubers, tea) was associated with less depressive symptoms developing over the course of pregnancy.
Adolescents				
McMartin, 2012 Pro. Cohort (Risk of Bias: 2/24) Children's Lifestyle and School Performance Study Canada	N=3,757 Cases: 294 Follow-up: 3y Age: 10-11y 52% female	Diet Quality Index–International (DQI-I)	DQI-I overall score (Referent group: 1st tertile) and risk of internalizing disorder: NS	These findings suggest that overall diet quality does not appear to play a major role in the risk of developing an internalizing disorder.