

Supplementary material

Appendix Search strategy

PubMed: limited to clinical trial, human, English

PubMed	Nonalcoholic fatty liver disease (Title)	Weight loss intervention (Title & Abstract)	Study
MeSH	Non-alcoholic Fatty Liver Disease	Diet, Carbohydrate-Restricted Diet, Mediterranean Diet, Fat-Restricted Diet, Vegetarian Diet, Reducing Diet Therapy Life Style Weight Reduction Program	clinical trial[pt] OR clinical trial*[all] OR phase trial*[all] OR phase 1 trial*[all] OR phase i trial*[all] OR phase 2 trial*[all] OR phase ii trial*[all] OR phase 3 trial*[all] OR phase iii trial*[all] OR phase 4 trial*[all] OR phase iv trial*[all] OR phase stud*[all] OR phase 1 stud*[all] OR phase i stud*[all] OR phase 2 stud*[all] OR phase ii stud*[all] OR phase 3 stud*[all] OR phase iii stud*[all] OR phase 4 stud*[all] OR phase iv stud*[all] OR multicenter study[pt] OR multicentre stud*[all] OR multicenter stud*[all] OR multicentre trial*[all] OR multicenter trial*[all] OR randomized controlled trial*[all] OR randomised controlled trial*[all] OR random allocation[mh] OR random allocation*[all] OR rct[all] OR rcts[all]
Text words	“nonalcoholic fatty liver” “non-alcoholic fatty liver” “NAFLD” “non-alcoholic steatohepatitis” “nonalcoholic steatohepatitis” “NASH” “Steatosis” “Steatohepatitis” “hepatic steatosis” “liver fat” “hepatic fat” “non-alcoholic”	“Dietary intervention” “Diet” “Dietary” “Diet*” “lifestyle modification” “lifestyle intervention” “lifestyle”	
	(((((((((((“nonalcoholic”[Title] OR “non-alcoholic hepatic fat “[Title] OR “liver fat “[Title] OR “hepatic steatosis”[Title] OR “non-alcoholic steatohepatitis”[Title] OR “non-alcoholic steatohepatitis”[Title] OR “nonalcoholic steatohepatitis”[Title] OR “NASH”[Title] OR “Steatosis”[Title] OR NAFLD[Title] OR “Non-alcoholic Fatty Liver Disease”[Mesh] OR “fatty liver”[Title] OR “nonalcoholic hepatic fat “[Title]	(((((((((((“Diet, Carbohydrate-Restricted”[Mesh] OR “Diet, Mediterranean”[Mesh] OR “Diet, Fat-Restricted”[Mesh] OR “Diet, Vegetarian”[Mesh] OR “Diet, Reducing”[Mesh] OR “Diet Therapy”[Mesh] OR “Dietary intervention”[Title/Abstract] OR Diet[Title/Abstract] OR Dietary[Title/Abstract] OR Diet*[Title/Abstract] (((“Life Style”[Mesh] OR “Weight Reduction Program”[Mesh] OR “lifestyle modification”[Title/Abstract] OR “lifestyle intervention”[Title/Abstract] OR “lifestyle”[Title/Abstract]	
Result 255 (up to January 2020)	((((clinical trial[pt] OR clinical trial*[all] OR phase trial*[all] OR phase 1 trial*[all] OR phase i trial*[all] OR phase 2 trial*[all] OR phase ii trial*[all] OR phase 3 trial*[all] OR phase iii trial*[all] OR phase 4 trial*[all] OR phase iv trial*[all] OR phase stud*[all] OR phase 1 stud*[all] OR phase i stud*[all] OR phase 2 stud*[all] OR phase ii stud*[all] OR phase 3 stud*[all] OR phase iii stud*[all] OR phase 4 stud*[all] OR phase iv stud*[all] OR multicenter study[pt] OR multicentre stud*[all] OR multicenter stud*[all] OR multicentre trial*[all] OR multicenter trial*[all] OR randomized controlled trial*[all] OR randomised controlled trial*[all] OR random allocation[mh] OR random allocation*[all] OR rct[all] OR rcts[all]))) AND (((((((((((“Diet, Carbohydrate-Restricted”[Mesh] OR “Diet, Mediterranean”[Mesh] OR “Diet, Fat-Restricted”[Mesh] OR “Diet, Vegetarian”[Mesh] OR “Diet, Reducing”[Mesh] OR “Diet Therapy”[Mesh] OR “Dietary intervention”[Title/Abstract] OR Diet[Title/Abstract] OR Dietary[Title/Abstract] OR Diet*[Title/Abstract] OR (((“Life Style”[Mesh] OR “Weight Reduction Program”[Mesh] OR “lifestyle modification”[Title/Abstract] OR “lifestyle intervention”[Title/Abstract] OR “lifestyle”[Title/Abstract]))) AND (((((((((((“nonalcoholic”[Title] OR “non-alcoholic hepatic fat “[Title] OR “liver fat “[Title] OR “hepatic steatosis”[Title] OR “steatohepatitis”[Title] OR “non-alcoholic steatohepatitis”[Title] OR “nonalcoholic steatohepatitis”[Title] OR “NASH”[Title] OR “Steatosis”[Title] OR NAFLD[Title] OR “Non-alcoholic Fatty Liver Disease”[Mesh] OR “fatty liver”[Title] OR “nonalcoholic hepatic fat “[Title]		

Scopus: limited to article and English

Scopus	Nonalcoholic fatty liver diseases (Article title)	Weight loss intervention (Title & Abstract)	Study
	"nonalcoholic fatty liver" "non-alcoholic fatty liver" "NAFLD" "non-alcoholic steatohepatitis" "nonalcoholic steatohepatitis" "NASH" "Steatosis" "Steatohepatitis" "hepatic steatosis" "liver fat" "hepatic fat" "non-alcoholic" "nonalcoholic"	"Carbohydrate-Restricted diet" "Mediterranean diet" "Fat-Restricted diet" "Vegetarian diet" "Reducing diet" "Diet Therapy" "Dietary intervention" "Dietary intervention" "Diet" "Dietary" "Diet" "lifestyle modification" "lifestyle intervention" "lifestyle" "Life Style" "Weight Reduction Program"	1. Randomized controlled trial 2. Controlled clinical trial 3. Randomized 4. Randomly 5. Trial 6. Groups 7. #1 OR #2 OR #3 OR #4 OR #5 OR #6 8. Animals AND NOT humans #7 AND NOT #8
	(TITLE ("nonalcoholic") OR TITLE ("nonalcoholic fatty liver") OR TITLE ("non-alcoholic fatty liver") OR TITLE ("NAFLD") OR TITLE ("non-alcoholic") OR TITLE ("hepatic fat") OR TITLE ("liver fat") OR TITLE ("hepatic steatosis") OR TITLE ("Steatohepatitis") OR TITLE ("Steatosis") OR TITLE ("NASH") OR TITLE ("nonalcoholic steatohepatitis") OR TITLE ("non-alcoholic steatohepatitis"))	Diet: (TITLE ("Diet*") OR TITLE-ABS-KEY ("Dietary") OR TITLE-ABS-KEY ("Diet") OR TITLE-ABS-KEY ("Dietary intervention") OR TITLE-ABS-KEY ("Diet Therapy") OR TITLE-ABS-KEY ("Reducing diet") OR TITLE-ABS-KEY ("Vegetarian diet") OR TITLE-ABS-KEY ("Fat-Restricted diet") OR TITLE-ABS-KEY ("Mediterranean diet") OR TITLE-ABS-KEY ("Carbohydrate-Restricted diet")) Lifestyle: (TITLE ("Weight Reduction Program") OR TITLE-ABS-KEY ("Life Style") OR TITLE-ABS-KEY ("lifestyle") OR TITLE-ABS-KEY ("lifestyle intervention") OR TITLE-ABS-KEY ("lifestyle modification"))	(((TITLE-ABS-KEY ("Randomized controlled trial")) OR (TITLE-ABS-KEY ("Controlled clinical trial")) OR (TITLE-ABS-KEY ("Randomized")) OR (TITLE-ABS-KEY ("Randomly")) OR (TITLE-ABS-KEY ("Trial")) OR (TITLE-ABS-KEY ("Groups")))) AND NOT ((TITLE-ABS-KEY ("animal")) AND NOT (TITLE-ABS-KEY ("humans"))))
Result 1928 (up to January 2020)	(((TITLE ("Diet*") OR TITLE-ABS-KEY ("Dietary") OR TITLE-ABS-KEY ("Diet") OR TITLE-ABS-KEY ("Dietary intervention") OR TITLE-ABS-KEY ("Dietary intervention") OR TITLE-ABS-KEY ("Diet Therapy") OR TITLE-ABS-KEY ("Reducing diet") OR TITLE-ABS-KEY ("Vegetarian diet") OR TITLE-ABS-KEY ("Fat-Restricted diet") OR TITLE-ABS-KEY ("Mediterranean diet") OR TITLE-ABS-KEY ("Carbohydrate-Restricted diet"))) OR ((TITLE ("Weight Reduction Program") OR TITLE-ABS-KEY ("Life Style") OR TITLE-ABS-KEY ("lifestyle") OR TITLE-ABS-KEY ("lifestyle intervention") OR TITLE-ABS-KEY ("lifestyle modification"))))) AND (((TITLE-ABS-KEY ("Randomized controlled trial")) OR (TITLE-ABS-KEY ("Controlled clinical trial")) OR (TITLE-ABS-KEY ("Randomized")) OR (TITLE-ABS-KEY ("Randomly")) OR (TITLE-ABS-KEY ("Trial")) OR (TITLE-ABS-KEY ("Groups")))) AND NOT ((TITLE-ABS-KEY ("animal")) AND NOT (TITLE-ABS-KEY ("humans")))))) AND ((TITLE ("nonalcoholic") OR TITLE ("nonalcoholic fatty liver") OR TITLE ("non-alcoholic fatty liver") OR TITLE ("NAFLD") OR TITLE ("non-alcoholic") OR TITLE ("hepatic fat") OR TITLE ("liver fat") OR TITLE ("hepatic steatosis") OR TITLE ("Steatohepatitis") OR TITLE ("Steatosis") OR TITLE ("NASH") OR TITLE ("nonalcoholic steatohepatitis") OR TITLE ("non-alcoholic steatohepatitis"))) AND (LIMIT-TO (LANGUAGE, "English"))		

Supplementary Table 1 Risk of bias assessment of included studies

First author, year [Ref.]	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessor	Missing outcome data	Selective outcome reporting	Other risk of bias
de Faria Ghetti 2019 [31]*	Low	Probably High	High	High	Low	Low	Low
Asghari 2018 [16]*	Low	Probably high	High	High	High	Low	Low
Cheng 2017 [32]*	Low	Low	High	Low	High	Low	Low
Abenavoli 2017 [33]*	Probably low	Probably high	Probably high	Probably high	Low	Low	Probably high †
Abenavoli 2015 [34]*	Probably low	Probably high	Probably high	Probably high	Low	Low	Probably high †

*Risk of bias were the same across outcomes of interest within each study

†Baseline imbalance

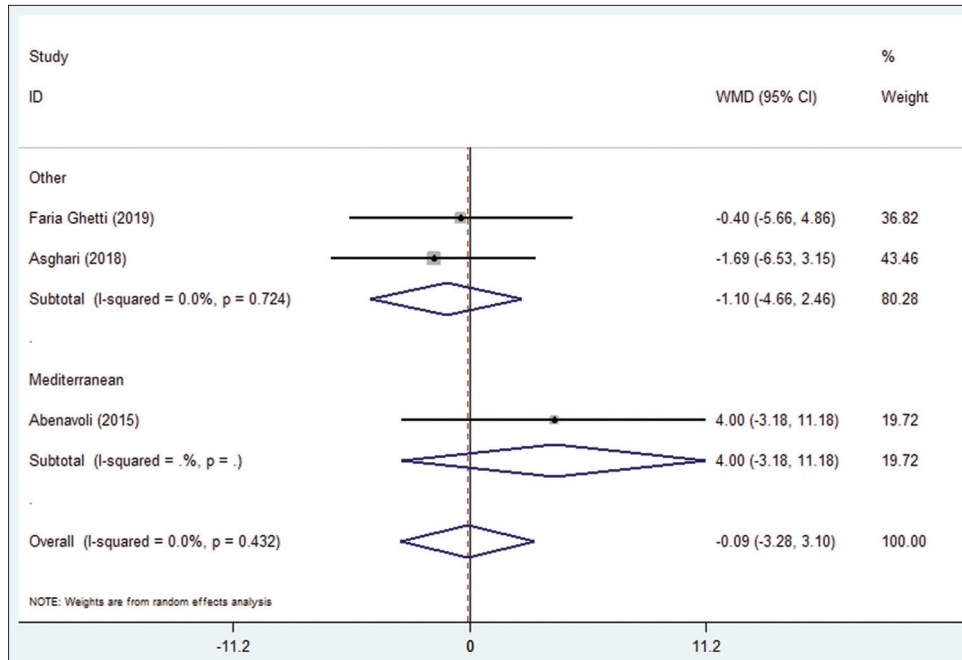
Supplementary Table 2 Subgroup analysis based on random-effect models to find the potential source of heterogeneity

Intervention	Diet on TG			Diet on LDL		
	n	I ² (%)	P-h	n	I ² (%)	P-h
Overall	5	55.8	0.060	4	86.2	<0.001
Study quality						
High	4	60.6	0.055	3	83.3	0.003
Unclear	1	-	-	1	-	-
Participants' age (year)						
≤50	2	0	0	2	0	0.400
>50	3	76.4	76.4	2	0	0.369
Participant's BMI						
Overweight	2	39.2	0.200	1	-	-
Obese	3	0	0.742	3	86.2	0.006
Type of diet						
Mediterranean (low calorie)	2	0	<0.001	2	0	0.369
Standard (low calorie)	2	0	<0.001	2	0	0.400
High fiber	1	-	-	0	-	-
Time (months)						
≤3	2	0	0.784	2	0	0.400
>3	3	76.4	0.014	2	0	0.369

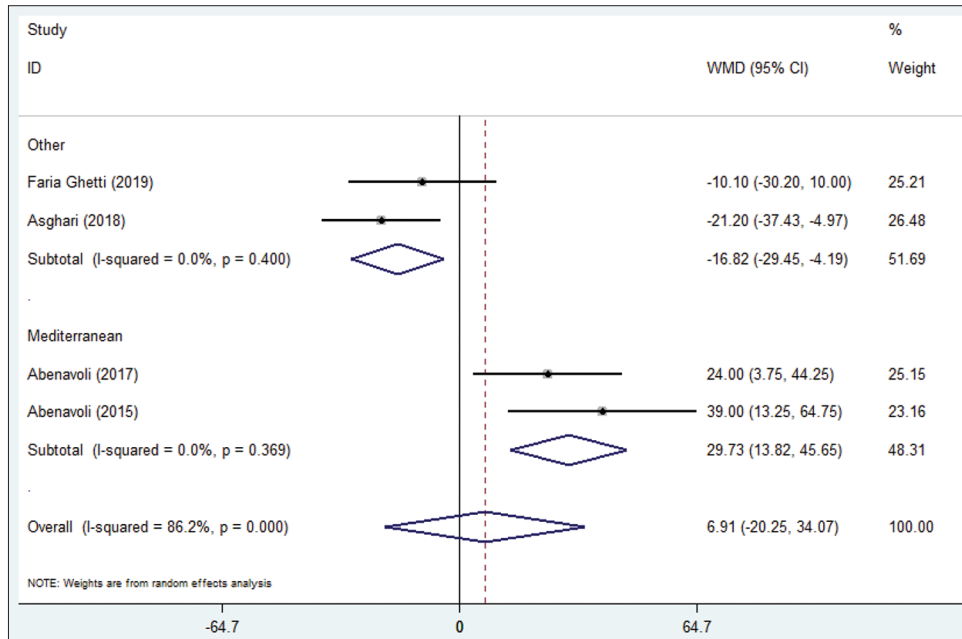
I²: the variation in weighted mean difference (WMD) attributable to heterogeneity; P-h, P- heterogeneity (test of heterogeneity between studies with significance of <0.1)

*After applying subgroup analysis, if heterogeneity turns to insignificance, that criterion is considered as a potential source of heterogeneity

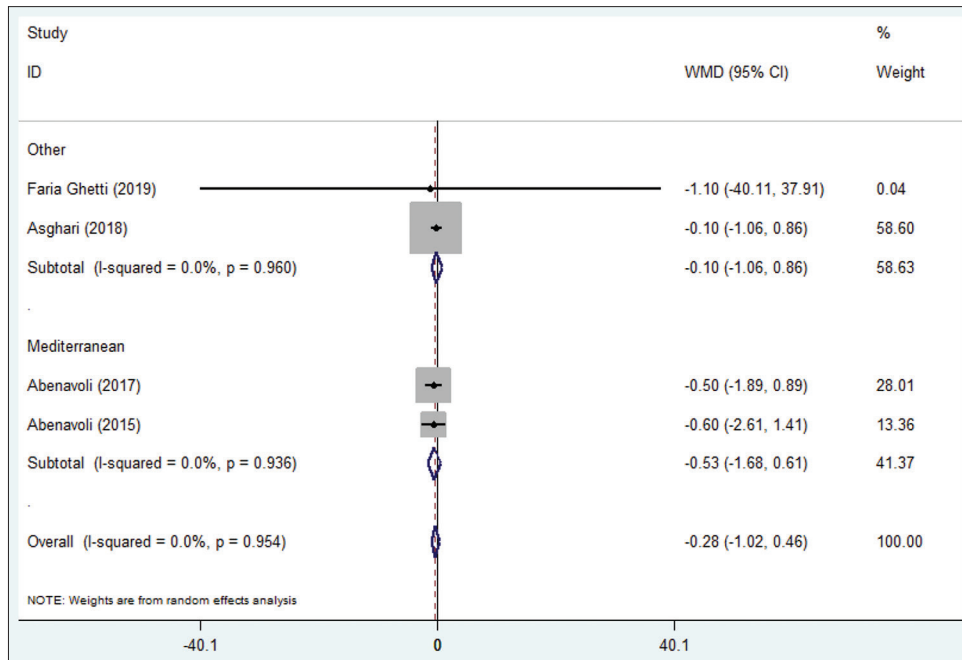
TG, triglycerides; LDL, low-density lipoprotein cholesterol; BMI, body mass index



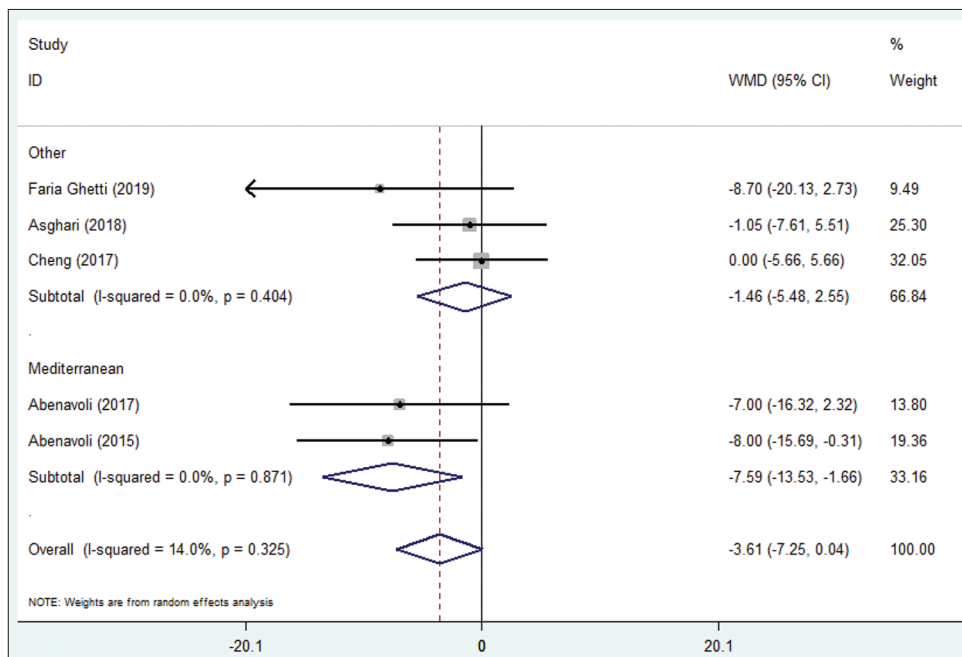
Supplementary Figure 1 Forest plot for the pooled weighted mean differences of diet interventions on the level of high-density lipoprotein cholesterol based on random-effect model
WMD, weighted mean difference; CI, confidence interval



Supplementary Figure 2 Forest plot for the pooled weighted mean differences of diet interventions on the level of low-density lipoprotein cholesterol based on random-effect model
WMD, weighted mean difference; CI, confidence interval



Supplementary Figure 3 Forest plot for the pooled weighted mean differences of diet interventions on homeostatic model assessment for insulin resistance based on random-effect model
WMD, weighted mean difference; CI, confidence interval



Supplementary Figure 4 Forest plot for the pooled weighted mean differences of diet interventions on weight based on random-effect model
WMD, weighted mean difference; CI, confidence interval