Supplementary material 2: Tables and Figures

Supplemental Table 1. Risk of bias summary: risk of bias item for each included RCT for metaanalysis according to Cochrane Risk-of-Bias Tool.

Supplemental Fig.1. Risk of bias summary: risk of bias item for each included RCT according to Cochrane Risk-of-Bias Tool.

Supplemental Fig.2. Risk of bias graph: each risk of bias item is presented as percentages across all included RCTs.

Supplemental Fig.3. Impact of carbohydrate-restricted diets on lipid profiles in dyslipidemia individuals. The subgroup analysis was conducted based on study designs, specifically examining interventions with moderate-low carbohydrate diets versus low carbohydrate diets.

Supplemental Fig.4. Impact of carbohydrate-restricted diets on the percentage change% in body weight among dyslipidemia individuals. The subgroup analysis was conducted based on study designs, specifically examining interventions with moderate-low carbohydrate diets versus low carbohydrate diets.

Supplemental Fig.5. Impact of carbohydrate-restricted diets on body fat% in dyslipidemia individuals.

Supplemental Fig.6. Impact of carbohydrate-restricted diets on glucose parameters in dyslipidemia individuals.

Supplemental Fig.7. Impact of carbohydrate-restricted diets on the levels of blood high-sensitivity C-Reactive Protein (hs-CRP) in dyslipidemia individuals.

Supplemental Fig.8. Sensitivity analysis of the impact of carbohydrate-restricted diets versus normal carbohydrates diets on total cholesterol, triglycerides, LDL-C, HDL-C, change% in body weight and fasting insulin in dyslipidemia individuals employing leave-one-out approach in all included studies.

Supplemental Fig.9. Funnel plots used for detecting publication bias in the comparison between carbohydrate-restricted diets and normal carbohydrate diets regarding their effects on lipid profiles, body weight, body fat%, glucose parameters, and high-sensitivity C-Reactive Protein (hs-CRP) in individuals with dyslipidemia.

Supplemental Fig.10. Meta-regression plots illustrating the association of mean difference in changes in metabolic parameters at the end of intervention with daily fat intake (energy%) across all included RCTs for meta-analysis.

Supplemental Fig.11. Meta-regression plots illustrating the association of mean difference in changes in metabolic parameters at the end of intervention with intervention days across all included RCTs for meta-analysis.

Supplemental Fig 12. Meta-regression plots illustrating the association of mean difference in changes in metabolic parameters at the end of intervention with daily protein intake (energy%) across included RCTs for meta-analysis.

Supplemental Fig.13. Impact of carbohydrate-restricted diets on lipid profiles in dyslipidemic individuals with overweight and obesity.

Supplemental Fig.14 Impact of carbohydrate-restricted diets on glucose parameters in dyslipidemic individuals with overweight and obesity.

Supplemental Table 1. Risk of bias summary: risk of bias item for each included RCT for meta-analysis according to Cochrane Risk-of-Bias Tool.

Studies	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Forsythe et al., 2008	Low risk.	Low risk.	Unclear risk.	Low risk.	Low risk.	Low risk.	Low risk.
Jenkins et al., 2009	Low risk.	Low risk.	Unclear risk.	Low risk.	Low risk.	Unclear risk.	Low risk.
Jenkins et al., 2014	Low risk.	Low risk.	High risk.	Low risk.	Low risk.	Low risk.	Low risk.
Maki et al., 2017	Low risk.	Low risk.	Low risk.	Low risk.	Low risk.	Low risk.	Low risk.
Mamo et al., 2005	Low risk.	Low risk.	High risk.	Low risk.	Low risk.	Unclear risk.	Low risk.
Pastore et al., 2015	Low risk.	Low risk.	Unclear risk.	Low risk.	Low risk.	Unclear risk.	Low risk.

Stoernell et al., 2008	Low risk.	Low risk.	Unclear risk.	Low risk.	Low risk.	Low risk.	Low risk.
Volek et al., 2009	Low risk.	Low risk.	Low risk.	Low risk.	Low risk.	Low risk.	Low risk.
Wu et al., 2021	Low risk.	Low risk.	Unclear risk.	Low risk.	Low risk.	Low risk.	Low risk.



Supplemental Fig.1 Risk of bias summary: risk of bias item for each included RCT according to Cochrane Risk-of-Bias Tool.



Supplemental Fig.2 Risk of bias graph: each risk of bias item is presented as percentages across all included RCTs.

A) Total cholesterol

	Ev	norimor	tal		Control									
Study	Total	Mean	SD	Total	Mean	SD		Mean Diff	erence		WMD	95%	СІ	Weight
Moderate-Low Carboh	ydrate	Diets (2	26-45 e	nergy	% per d	ay)								
Jenkins et al., 2009	25	185.26	27.70	25	213.01	26.84					-27.75	[-42.87;	12.63]	13.7%
Jenkins et al., 2014	20	235.83	35.53	19	250.90	42.14		-	-0		-15.08	[-39.60;	9.45]	7.5%
Maki et al., 2017	25	196.00	17.70	25	204.00	13.40					-8.00	[-16.70;	0.70]	20.8%
Mamo et al., 2005	10	197.17	7.73	10	220.36	15.46					-23.20	[-33.91;	12.48]	18.4%
Wu et al., 2021_1	27	191.75	32.14	27	193.69	32.14		- 	-		-1.93	[-19.08;	15.21]	12.0%
Wu et al., 2021 2	27	191.75	32.14	27	194.85	34.15					-3.09	[-20.78;	14.60]	11.6%
Random effects model	134			133				-			-13.63	[-22.45;	-4.80]	83.9%
Heterogeneity: $I^2 = 55\%$, τ	2 = 63.1	78, p = 0.	05											
Test for effect in subgroup	z = -3	.03 (p < 0	0.01)											
Low Carbohydrate Die	ts (11-	25 ener	gy% p	er day)									
Forsythe et al., 2008	20	196.50	34.90	20	194.50	34.00					2.00	[-19.35;	23.35]	9.1%
Pastore et al., 2015	20	181.70	27.06	20	228.09	228.09	←+				-46.39	[-147.06;	54.27]	0.6%
Stoernell et al., 2008	10	172.81	17.40	13	182.86	46.01	-		-		-10.05	[-37.29;	17.18]	6.4%
Random effects model	50			53					-		-3.78	[-20.35;	12.80]	16.1%
Heterogeneity: $I^2 = 0\%$, τ^2	= 0, p =	= 0.56										-	-	
Test for effect in subgroup	z = -0	45(p = 0)	0.66)											
Random effects model	184			186				-			-12.19	[-20.04;	-4.331	100.0%
Prediction interval												1-32.48:	8.111	
Heterogeneity: $I^2 = 41\%$, τ	$^{2} = 57.5$	p = 0	09				Г		1	1		•		
Test for overall effect: z =	3.04 (< 0.01)				-f	50 -40	-20 0	20	40	60			
Test for subgroup difference	es: y2	= 1.06. d	f = 1 (p)	= 0.30)	F	avorslir	tervention	Favor	sicont	oll			
	~1				·						- 4			

B) Triglycerides

	Fr	nerimer	ntal		Control						
Study	Total	Mean	SD	Total	Mean	SD	Mean Diffe	rence	WMD	95%CI	Weight
Moderate-Low Carbohy	drate	Diets (2	26-45 e	nergy	% per d	ay)					
Jenkins et al., 2009	25	104.78	40.70	25	116.72	31.95	<u>+ + + -</u>		-11.94	[-32.22; 8.34]	12.6%
Jenkins et al., 2014	20	132.90	52.01	19	151.51	66.45		-	-18.61	[-56.19; 18.97]	8.9%
Maki et al., 2017	25	141.00	25.00	25	169.00	26.00			-28.00	[-42.14; -13.86]	13.7%
Mamo et al., 2005	10	124.04	35.44	10	194.92	26.58			-70.88	[-98.34; -43.42]	11.0%
Wu et al., 2021_1	27	86.83	27.62	27	92.14	27.62			-5.32	[-20.05; 9.42]	13.6%
Wu et al., 2021_2	27	86.83	27.62	27	89.49	27.62			-2.66	[-17.39; 12.08]	13.6%
Random effects model	134			133					-21.45	[-40.58; -2.32]	73.6%
Heterogeneity: $I^2 = 79\%$, τ^2	$^{2} = 450$.44, p < (0.01								
Test for effect in subgroup:	z = -2	20 (p = 0)	0.03)								
Low Carbohydrate Die	ts (11-	25 ener	gy% p	er day)		_				
Forsythe et al., 2008	20	103.70	44.10	20	151.20	38.00			-47.50	[-73.01; -21.99]	11.5%
Pastore et al., 2015	20	79.74	26.58	20	141.76	53.16			-62.02	[-88.07; -35.97]	11.3%
Stoernell et al., 2008	10	117.84	54.05	13	184.29	134.67	< I -		-66.45	[-146.96; 14.06]	3.6%
Random effects model	50			53			-		-55.19	[-72.96; -37.41]	26.4%
Heterogeneity: $I^2 = 0\%$, τ^2	= 0, p =	= 0.71									
Test for effect in subgroup:	z = -6.	.08 (p < (0.01)								
Denden offerste medel	404			400					20.00		400.00/
Random effects model	184			186					-30.82	[-48.44; -13.19]	100.0%
Prediction Interval	2 - 500	10	0.04					_		[-89.57; 27.94]	
Heterogeneity: $I = 80\%, \tau$	= 536	48, p < (J.01			4	00 50 0	50 40	0		
Test for sub-security difference	-3.43 (p	- 0.01)	f = 1 / -	- 0.01		-1	0 -50 0	00 10	0		
rest for subgroup difference	es. χ_1	- 0.41, d	1 – 1 (p	- 0.01)	F	avors[intervention]	Favors[contro	oi]		

C) HDL-C

	Ex	perime	ntal		Contro					
Study	Tota	Mean	SD	Total	Mean	SD	Mean Difference	WMD	95%CI	Weight
Moderate-Low Carboh	ydrate	Diets (26-45	energ	y% per	day)				
Jenkins et al., 2014	20	48.33	11.95	19	52.19	10.44		-3.87	[-10.90; 3.17]	3.7%
Maki et al., 2017	25	43.52	3.09	25	41.76	3.19		1.77	[0.03; 3.51]	59.9%
Mamo et al., 2005	10	50.26	3.87	10	46.39	3.87		3.87	[0.48; 7.25]	15.8%
Wu et al., 2021_1	27	46.39	12.05	27	46.01	12.05		0.39	[-6.04; 6.82]	4.4%
Wu et al., 2021_2	27	46.39	12.05	27	47.17	12.05		-0.77	[-7.20; 5.66]	4.4%
Random effects model	109			108			+	1.71	[0.28; 3.15]	88.1%
Heterogeneity: $I^2 = 15\%$, τ	² = < 0	.01, p =	0.32							
Test for effect in subgroup	z = 2.	34 (p = 1	0.02)							
Low Carbohydrate Die	ts (11-	25 ener	rgy%	per da	iy)					
Forsythe et al., 2008	20	40.40	9.60	20	38.40	5.50		2.00	[-2.85; 6.85]	7.7%
Pastore et al., 2015 1	10	62.63	14.30	10	44.07	11.21		→ 18.56	[7.29; 29.82]	1.4%
Pastore et al., 2015 2	10	76.16	9.66	10	58.76	19.33		→ 17.40	[4.00; 30.79]	1.0%
Stoernell et al., 2008	10	43.69	7.73	13	42.53	16.62		1.16	[-9.07; 11.39]	1.7%
Random effects model	50			53				8.72	[-0.47; 17.92]	11.9%
Heterogeneity: $I^2 = 72\%$, τ	2 = 62.	39. p = 0	0.01							
Test for effect in subgroup	z = 1.	86 (p = 1	0.06)							
the second state of the se										
Random effects model	159			161			÷	2.13	[0.78; 3.47]	100.0%
Prediction interval									[0.50; 3.75]	
Heterogeneity: $I^2 = 56\%$, τ	$^{2} < 0.0$	1. p = 0.0	02							
Test for overall effect: z = 3	3.09 (p	< 0.01)				-20	-10 0 10	20		
Test for subgroup difference	es: χ_1^2	= 2.18, 0	df = 1 (p = 0.1	4)	Fav	ors[intervention] Favors[control]		

D) LDL-C

	Ex	perimer	ntal		Control							
Study	Total	Mean	SD	Total	Mean	SD	Mean Diffe	erence	WMD	95%	6CI	Weight
Moderate-Low Carbohy	ydrate	Diets (2	26-45 e	nergy	% per d	lay)						
Jenkins et al., 2009	25	121.79	21.42	25	145.58	21.59	-+		-23.79	[-35.72;	-11.87]	12.0%
Jenkins et al., 2014	20	156.96	29.30	19	170.10	39.82			-13.14	[-35.18;	8.89]	9.5%
Maki et al., 2017	25	115.97	13.12	25	115.58	12.67	-		0.38	[-6.77;	7.53]	12.9%
Mamo et al., 2005	10	119.85	7.73	10	135.31	15.46			-15.46	[-26.18;	-4.75]	12.3%
Wu et al., 2021 1	27	127.19	24.11	27	127.58	22.10			-0.39	[-12.72;	11.95]	11.9%
Wu et al., 2021 2	27	127.19	24.11	27	129.12	26.11			-1.93	[-15.34;	11.47]	11.7%
Random effects model	134			133			-		-8.50	[-17.03;	0.02	70.2%
Heterogeneity: $I^2 = 69\%$, τ^2	$^{2} = 72.5$	59, p < 0.	01							-		
Test for effect in subgroup:	z = -1	.95 (p = (0.05)									
Low Carbohydrate Die	ts (11-	25 ener	av% p	er dav)							
Forsythe et al., 2008	20	135.40	31.40	20	125.90	32.10		-	9.50	[-10,18;	29.18]	10.1%
Pastore et al., 2015	20	96.65	27.06	20	150.77	23.20			-54.12	[-69.74;	-38.501	11.1%
Stoernell et al., 2008	10	109.41	17.40	13	111.34	42.53			-1.93	[-27.44]	23.58]	8.6%
Random effects model	50			53				-	-16.18	[-55.48;	23.11	29.8%
Heterogeneity: $I^2 = 93\%$, τ^2	² = 109	6.17. p <	0.01							-	-	
Test for effect in subgroup:	z = -0	.81 (p = (0.42)									
		4										
Random effects model	184			186			-		-11.44	[-23.82:	0.941	100.0%
Prediction interval								- C		[-54.74:	31.851	
Heterogeneity: $I^2 = 85\%$, τ^2	$^{2} = 295$.35. p < (0.01							-		
Test for overall effect: z = -	-1.81 (= 0.07)				-100	-50 0	50 10	0			
Test for subgroup difference	es: χ_1^2	= 0.14, d	f = 1 (p	= 0.71)	Fav	ors[intervention]	Favors[control]			

E) ApoB

	Ex	perimer	ntal		Control								
Study	Total	Mean	SD	Total	Mean	SD	1	Mean Diff	erence		WMD	95%CI	Weight
Moderate-Low Carboh	ydrate	Diets (2	26-45 e	nergy	% per d	lay)							
Jenkins et al., 2009	25	108.00	19.46	25	118.00	15.29					-10.00	[-19.70; -0.30]	12.5%
Jenkins et al., 2014	20	120.00	22.40	19	123.00	21.00					-3.00	[-16.62; 10.62]	6.8%
Maki et al., 2017	25	94.36	6.65	25	102.02	8.45					-7.66	[-11.88; -3.44]	40.6%
Wu et al., 2021_1	27	91.80	15.07	27	92.20	14.55			15		-0.40	[-8.30; 7.50]	17.5%
Wu et al., 2021_2	27	91.80	15.07	27	92.00	18.19			-		-0.20	[-9.11; 8.71]	14.4%
Random effects model	124			123				-			-4.96	[-9.06; -0.86]	91.9%
Heterogeneity: $I^2 = 19\%$, τ^2	$^{2} = 5.95$	p = 0.3	0										
Test for effect in subgroup	z = -2	.37 (p =	0.02)										
Low Carbohydrate Die	ts (11-	25 ener	av% p	er dav	()								
Volek et al., 2009	20	98.00	21.00	20	102.00	19.00			100		-4.00	[-16.41; 8.41]	8.1%
Random effects model	144			143				-			-4.99	[-8.70; -1.27]	100.0%
Prediction interval						-					Sec. 1	[-12.75; 2.78]	
Heterogeneity: $I^2 = 0\%$, τ^2	= 4.23,	p = 0.42				L.					1		
Test for overall effect: z = -	-2.63 (p	< 0.01)				-60	0 -40	-20 0	20	40	60		
Test for subgroup difference	$es: \chi_1^2$	= 0.02, d	f = 1 (p	= 0.89)	Fa	vors[in	tervention]	Favor	s[conti	rol]		

Supplemental Fig.3 Impact of carbohydrate-restricted diets on lipid profiles in dyslipidemia individuals. Examining the effect of carbohydrate-restricted diets on profiles at intervention conclusion compared to normal carbohydrate diets in dyslipidemia individuals across all included RCTs. Random effects model was employed based on the DerSimonian and Laird (DL) method. A) Total cholesterol; B) Triglycerides; C) HDL-C; D) LDL-C; E) ApoB. The subgroup analysis was conducted based on study designs, specifically examining interventions with moderate-low carbohydrate diets versus low carbohydrate diets.

WMD (Weighted Mean Difference) reveals the percentage mean difference at intervention conclusion between experimental and control groups. Data points denote mean differences, and horizontal error bars show 95% confidence intervals. Shaded areas reflect study weights in the random-effects meta-analysis. The vertical dashed line marks the pooled point estimate, while the solid black line represents the null hypothesis (MD=0). Red diamonds signify subgroup and overall effects, accompanied by a red solid line indicating the prediction interval. Abbreviation: HDL-C: High-Density Lipoprotein Cholesterol; LDL-C: Low-Density Lipoprotein Cholesterol; ApoB: Apolipoprotein B; RCTs: Randomized Controlled Trials.



Supplemental Fig.4 Impact of carbohydrate-restricted diets on the percentage change% in body weight among dyslipidemia individuals. Examining the effect of carbohydrate-restricted diets on body weight at intervention conclusion compared to normal carbohydrate diets in dyslipidemia individuals across all included RCTs. Random effects model was employed based on the DerSimonian and Laird (DL) method. The subgroup analysis was conducted based on study designs, specifically examining interventions with moderate-low carbohydrate diets versus low carbohydrate diets.

WMD (Weighted Mean Difference) reveals the percentage mean difference at intervention conclusion between experimental and control groups. Data points denote mean differences, and horizontal error bars show 95% confidence intervals. Shaded areas reflect study weights in the random-effects meta-analysis. The vertical dashed line marks the pooled point estimate, while the solid black line represents the null hypothesis (MD=0). Red diamonds signify subgroup and overall effects, accompanied by a red solid line indicating the prediction interval. Abbreviation: RCTs: Randomized Controlled Trials.



pplemental Fig.5 Impact of carbohydrate-restricted diets on body fat% in dyslipidemia individuals. Examining the effect of carbohydrate-restricted diets on body fat% at intervention conclusion compared to normal carbohydrate diets in dyslipidemia individuals across all included RCTs. Random effects model was employed based on the DerSimonian and Laird (DL) method.

WMD (Weighted Mean Difference) reveals the percentage mean difference at intervention conclusion between experimental and control groups. Data points denote mean differences, and horizontal error bars show 95% confidence intervals. Shaded areas reflect study weights in the random-effects meta-analysis. The vertical dashed line marks the pooled point estimate, while the solid black line represents the null hypothesis (MD=0). Red diamonds signify subgroup and overall effects, accompanied by a red solid line indicating the prediction interval. Abbreviation: RCTs: Randomized Controlled Trials; MLCDs: Moderate-Low Carbohydrate Diets; LCDs: Low Carbohydrate Diets.

A) Fasting glucose

	Contro	1												
Study	Total	Mean	SD	Total	Mean	SD		lean	Diffe	rence	•	WMD	95%CI	Weight
Moderate-Low Carboby	drate	Diets (26-45	enera	v% ner	(veb)			ł					
lonking of al 2014	20	82.80	0.61	10	82.80	3 73			+			0.00	[1 53: 1 53]	6 5%
Maki ot al. 2017	25	101 50	1 72	25	101 /0	3.06			F			0.00	[1 27: 1 48]	60.0%
Wu ot al. 2021 1	27	00 20	7 40	27	95 50	6.55			E.			2.00	[0.97:6.62]	0.4%
Wu et al. 2021_1	27	00.00	7.40	27	96.04	6.55			<u> </u>			2.00	[-0.07, 0.03]	9.4 /0
Rendem effects model	21	00.00	7.40	21	00.94	0.55			E.			0.50	[-2.31, 3.19]	9.4 /0
Random effects model	99			98					1			0.50	[-0.08; 1.08]	95.2%
Heterogeneity: $I^{-} = 0\%$, τ^{-}	= 0, p =	= 0.54												
Test for effect in subgroup:	z = 0.8	33(p = 0)	.40)											
Low Carbohydrate Die	ts (11-	25 ener	av%	per da	V)									
Volek et al., 2009	20	89.00	8.00	20	94.00	9.00		2	-			-5.00	[-10.28; 0.28]	4.8%
	1000000											10000000		101010100000
Random effects model	119			118					1			0.24	[-0.91; 1.39]	100.0%
Prediction interval						_			-				[-1.63; 2.11]	
Heterogeneity: $I^2 = 35\%$, τ^2	< 0.01	, p = 0.1	9			1	1	L	1	1	I.	1		
Test for overall effect: z = 0).41 (p	= 0.68)				-60	-40	-20	0	20	40	60		
Test for subgroup difference	es: χ_1^2	= 3.98, d	f = 1 (p = 0.0	5)	Fav	ors[int	ervent	tion]	Favo	rs[co	ntrol]		

B) Fasting insulin

	Exp	perime	ntal	(Contro									
Study	Total	Mean	SD	Total	Mean	SD		Mean	Diffe	rence)	MMD	95%CI	Weight
Jenkins et al., 2014_MLCDs	20	33.30	22.54	19	36.40	18.67			-			-3.10	[-16.06; 9.86]	20.9%
Maki et al., 2017_MLCDs	11	82.11	25.47	14	67.18	20.93			_		- 1	19.66	[-3.03; 34.21]	15.2%
Wu et al., 2021 1 MLCDs	27	96.14	26.10	27	88.25	26.10			-		-	7.89	[-6.03; 21.81]	19.2%
Wu et al., 2021_2_MLCDs	27	96.14	26.10	27	97.58	29.83					-	1.44	[-16.38; 13.51]	18.7%
Volek et al., 2009_LCDs	20	54.00	57.00	20	57.00	57.00	-					-3.00	[-38.33; 32.33]	6.4%
Random effects model Prediction interval	115			117				-	+	-		0.76	[-10.71; 9.19] [-29.31: 27.79]	100.0%
Heterogeneity: $I^2 = 52\%$, $\tau^2 = 7$	9.92, p	= 0.06								I				
Test for overall effect: z = -0.15	(p = 0)	.88)					-40	-20	0	20	40			
						F	avorsli	nterver	ntion	Favors	[control]			

C) Fasting insulin adjusted based on leave-one-out approach



Supplemental Fig.6 Impact of carbohydrate-restricted diets on glucose parameters in dyslipidemia individuals. Examining the effect of carbohydraterestricted diets on glucose parameters at intervention conclusion compared to normal carbohydrate diets in dyslipidemia individuals across all included RCTs. Random effects model was employed based on the DerSimonian and Laird (DL) method. A) Fasting glucose; B) Fasting insulin; C) Fasting insulin adjusted based on leave-oneout approach; The subgroup analysis was conducted based on study designs, specifically examining interventions with moderate-low carbohydrate diets versus low carbohydrate diets.

WMD (Weighted Mean Difference) reveals the percentage mean difference at intervention conclusion between experimental and control groups. Data points denote mean differences, and horizontal error bars show 95% confidence intervals. Shaded areas reflect study weights in the random-effects meta-analysis. The vertical dashed line marks the pooled point estimate, while the solid black line represents the null hypothesis (MD=0). Red diamonds signify subgroup and overall effects, accompanied by a red solid line indicating the prediction interval. Abbreviation: RCTs: Randomized Controlled Trials; MLCDs: Moderate-Low Carbohydrate Diets; LCDs: Low Carbohydrate Diets.

	Ex	perime	ntal		Contro								
Study	Total	Mean	SD	Total	Mean	SD	Mean	Difference	e	WMD	95%	CI	Weight
Moderate-Low Carboh	drate	Diets (26-45	energ	v% per	dav)		l.					
Jenkins et al 2014	20	26.00	33 10	19	19 00	11 40				7 00	[-8.39-2	2 391	0.0%
Wu et al 2021 1	27	0.62	0.62	27	0.99	0.99		10		-0.36	[-0.80]	0.081	39.0%
Wu et al 2021 2	27	0.62	0.62	27	0.68	0.68				-0.05	[-0.40	0 291	59.2%
Random effects model	74			73				T		-0.17	I-0.47:	0.121	98.2%
Heterogeneity: $I^2 = 1\%$, τ^2 :	= < 0.0	1, p = 0	.36								•		
Test for effect in subgroup:	z = -1	.14 (p =	0.25)										
Low Carbohydrate Diet	s (11-	25 ener	rgy%	per da	y)								
Forsythe et al., 2008	20	5.00	5.00	20	3.00	4.00		+		2.00	[-0.81;	4.81]	1.1%
Stoernell et al., 2008	10	3.16	5.07	13	2.12	1.99		+		1.04	[-2.28;	4.36]	0.8%
Random effects model	30			33				•		1.60	[-0.54;	3.74]	1.8%
Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0\%$	= 0, p =	= 0.67											
Test for effect in subgroup:	z = 1.	46(p = 0)	0.14)										
Random effects model	104			106						-0.14	[-0.43;	0.15]	100.0%
Prediction interval											[-0.67;	0.39]	
Heterogeneity: $I^2 = 16\%$, τ^2	< 0.0	p = 0.3	31				1 1 1	1 1	1 1				
Test for overall effect: z = -	0.95 (p	0 = 0.34))			-6	60 -40 -20	0 20	40 60				
Test for subgroup difference	es: χ ₁	= 2.58, 0	df = 1 (p = 0.1	1)	F	avors[intervent	ion] Favo	rs[control]]			

Supplemental Fig.7 Impact of carbohydrate-restricted diets on the levels of blood high-sensitivity C-Reactive Protein (hs-CRP) in dyslipidemia individuals. Examining the effect of carbohydrate-restricted diets on the levels of blood high-sensitivity C-Reactive Protein (hs-CRP) at intervention conclusion compared to normal carbohydrate diets in dyslipidemia individuals across all included RCTs. Random effects model was employed based on the DerSimonian and Laird (DL) method. The subgroup analysis was conducted based on study designs, specifically examining interventions with moderate-low carbohydrate diets versus low carbohydrate diets.

WMD (Weighted Mean Difference) reveals the percentage mean difference at intervention conclusion between experimental and control groups. Data points denote mean differences, and horizontal error bars show 95% confidence intervals. Shaded areas reflect study weights in the random-effects meta-analysis. The vertical dashed line marks the pooled point estimate, while the solid black line represents the null hypothesis (MD=0). Red diamonds signify subgroup and overall effects, accompanied by a red solid line indicating the prediction interval. Abbreviation: RCTs: Randomized Controlled Trials; MLCDs: Moderate-Low Carbohydrate Diets; LCDs: Low Carbohydrate Diets.



A) Total cholesterol in Moderate-Low carbohydrates diets RCTs (n=6)



B) Triglycerides in Moderate-Low carbohydrates diets RCTs (n=6)



C) LDL-C in Moderate-Low carbohydrates diets RCTs (n=6)



D) HDL-C in Low carbohydrates diets RCTs (n=4)







F) Fasting insulin in all included studies (RCTs, n=6)

Supplemental Fig.8 Sensitivity analysis of the impact of carbohydrate-restricted diets versus normal carbohydrates diets on total cholesterol, triglycerides, LDL-C, HDL-C, change% in body weight and fasting insulin in dyslipidemia individuals employing leave-one-out approach in all included studies.

A) Total cholesterol in Moderate-Low carbohydrates diets RCTs (n=6)

B) Triglycerides in Moderate-Low carbohydrates diets RCTs (n=6)

C) LDL-C in Moderate-Low carbohydrates diets RCTs (n=6)

D) HDL-C in Low carbohydrates diets RCTs (n=4)

E) Change% in body weight in all included studies (Moderate-Low carbohydrates

diets, n=3; Low-carbohydrates diets, n=3)

F) Fasting insulin in all included studies (RCTs, n=6)

Abbreviations: HDL-C: High-Density Lipoprotein Cholesterol; LDL-C: Low-Density Lipoprotein Cholesterol. RCTs: Randomized Controlled Trials.

A) Total cholesterol







C) HDL-C











F) Body weight change%



G) Body fat%







I) Fasting insulin



J) high-sensitivity C-Reactive Protein (hs-CRP)



Supplemental Fig.9 Funnel plots used for detecting publication bias in the comparison between carbohydrate-restricted diets and normal carbohydrate diets regarding their effects on lipid profiles, body weight, body fat%, glucose parameters, and high-sensitivity C-Reactive Protein (hs-CRP) in individuals with dyslipidemia. A) total cholesterol; B) triglycerides; C) HDL-C; D) LDL-C; E) ApoB; F) change% in body weight; G) body fat%; H) fasting glucose; I) fasting insulin; J) high-sensitivity C-Reactive Protein (hs-CRP). The Hedges' g values are plotted on the x-axis against standard errors on the y-axis. In the absence of publication bias, the plotted points should form a funnel shape.

Abbreviations:ApoB:ApolipoproteinB;HDL-C:High-DensityLipoproteinCholesterol;LDL-C:Low-DensityLipoproteinCholesterol;MLCDs:Moderate-LowCarbohydrateDiets;LCDs:LowCarbohydrateDiets.



Supplemental Fig 10. Meta-regression plots illustrating the association of mean difference in changes in metabolic parameters at the end of intervention with daily fat intake (energy%) across included RCTs for meta-analysis. A) Total cholesterol; B) Triglycerides; C) HDL-C; D) LDL-C; E) ApoB; F) Change% in body weight.

Abbreviations: ApoB: Apolipoprotein B; HDL-C: High-Density Lipoprotein Cholesterol; LDL-C: Low-Density Lipoprotein Cholesterol; RCTs: Randomized Controlled Trials.



Supplemental Fig 11. Meta-regression plots illustrating the association of mean difference in changes in metabolic parameters at the end of intervention with intervention days across included RCTs for meta-analysis. A) Total cholesterol; B) Triglycerides; C) HDL-C; D) LDL-C; E) ApoB; F) Change% in body weight.

Abbreviations: ApoB: Apolipoprotein B; HDL-C: High-Density Lipoprotein Cholesterol; LDL-C: Low-Density Lipoprotein Cholesterol; RCTs: Randomized Controlled Trials.



Supplemental Fig.12 Meta-regression plots illustrating the association of mean difference in changes in metabolic parameters at the end of intervention with daily protein intake (energy%) across included RCTs for meta-analysis. A) Total cholesterol; B) Triglycerides; C) HDL-C; D) LDL-C; E) ApoB; F) Change% in body weight.

Abbreviations: ApoB: Apolipoprotein B; HDL-C: High-Density Lipoprotein Cholesterol; LDL-C: Low-Density Lipoprotein Cholesterol; RCTs: Randomized Controlled Trials.

A) Total cholesterol adjusted based on leave-one-out approach

	Ex	perimer	ntal		Control										
Study	Total	Mean	SD	Total	Mean	SD	I	Mean	Diffe	erence	e		WMD	95%CI	Weight
Jenkins et al., 2014 Maki et al., 2017 Forsythe et al., 2008	20 25 20	235.83 196.00 196.50	35.53 17.70 34.90	19 25 20	250.90 204.00 194.50	42.14 13.40 34.00	-	-				-	-15.08 -8.00 2.00	[-39.60; 9.45] [-16.70; 0.70] [-19.35; 23.35]	9.7% 77.4% 12.9%
Random effects model Prediction interval Heterogeneity: $I^2 = 0\%$, τ^2 Test for overall effect: $z = -$	65 = 0, p = 1.90 (p	= 0.57 9 = 0.06)		64		-60 Fav	-40 vors[int	-20 terven	0 tion]	20 Favo	40 ors[col	60 ntrol]	-7.40	[-15.06; 0.25] [-57.04; 42.23]	100.0%

B) Triglycerides

	Ex	perimer	ntal		Control	An exercise					
Study	Total	Mean	SD	Total	Mean	SD	Mean	Difference	WMD	95%CI	Weight
Jenkins et al., 2009	25	104.78	40.70	25	116.72	31.95	+	-	-11.94	[-32.22; 8.34]	27.9%
Jenkins et al., 2014	20	132.90	52.01	19	151.51	66.45		-	-18.61	[-56.19; 18.97]	11.7%
Maki et al., 2017	25	141.00	25.00	25	169.00	26.00		-	-28.00	[-42.14; -13.86]	39.5%
Forsythe et al., 2008	20	103.70	44.10	20	151.20	38.00			-47.50	[-73.01; -21.99]	20.9%
Random effects model	90			89			-	•	-26.50	[-40.67; -12.34]	100.0%
Prediction interval								_		[-76.00; 22.99]	
Heterogeneity: $I^2 = 37\%$, τ^2	² = 80.1	2, p = 0.	19				1				
Test for overall effect: z = -	-3.67 (p	< 0.01)				-100	-50	0 50	100		
						Fav	ors[interver	ntion] Favor	rs[control]		

C) HDL-C

	Ex	perime	ntal	Control									
Study	Total	Mean	SD	Total	Mean	SD		Mean	Differe	ence	WMD	95%CI	Weight
Jenkins et al., 2014 Maki et al., 2017 Forsythe et al., 2008	20 25 20	48.33 43.52 40.40	11.95 3.09 9.60	19 25 20	52.19 41.76 38.40	10.44 3.19 5.50			•		-3.87 1.77 2.00	[-10.90; 3.17] [0.03; 3.51] [-2.85; 6.85]	5.1% 84.0% 10.8%
Random effects model Prediction interval Heterogeneity: $I^2 = 16\%$, τ^2	65	1, p = 0.000	31	64					-	10	1.50	[-0.09; 3.10] [-8.84; 11.84]	100.0%
rest for overall effect. 2 -	1.65 (p	- 0.00)				F	avo	- 10 rs[interve	ntion] F	avors[c	ontrol]		

D) LDL-C adjusted based on leave-one-out approach

	Experimental				Control							
Study	Total	Mean	SD	Total	Mean	SD	Mea	n Differ	rence	WMD	95%CI	Weight
Jenkins et al., 2014 Maki et al. 2017	20 25	156.96	29.30	19 25	170.10 115.58	39.82 12.67	_	++		-13.14	[-35.18; 8.89] [-6.77; 7.53]	8.5% 80.8%
Forsythe et al., 2008	20	135.40	31.40	20	125.90	32.10				9.50	[-10.18; 29.18]	10.7%
Random effects model Prediction interval	65	n = 0.2	2	64		F		+		0.21	[-6.22; 6.63] [-41.47; 41.88]	100.0%
Test for overall effect: $z = 0.06$ ($p = 0.95$)						-100 Fav) -50 vors[interve	0 ention]	50 Favors[c	100 ontrol]		

E) ApoB

	Experimental			Control								
Study	Total	Mean	SD	Total	Mean	SD	Me	an Diff	erence	WME	95%CI	Weight
Jenkins et al., 2009	25	108.00	19.46	25	118.00	15.29 ·				-10.0	0 [-19.70; -0.30]	13.5%
Jenkins et al., 2014	20	120.00	22.40	19	123.00	21.00	-			-3.00	[-16.62; 10.62]	6.8%
Maki et al., 2017	25	94.36	6.65	25	102.02	8.45		-		-7.66	[-11.88; -3.44]	71.4%
Volek et al., 2009	20	98.00	21.00	20	102.00	19.00	5 <u>-</u>			-4.00	[-16.41; 8.41]	8.2%
Random effects model	90			89			-			-7.36	[-10.92; -3.79]	100.0%
Prediction interval							_				[-15.18: 0.47]	
Heterogeneity: $I^2 = 0\%$, τ^2	= 0, p =	= 0.81				ſ						
Test for overall effect: z = -	4.05 (p	< 0.01)				-2	0 -10	0	10	20		
						Fa	avors[inter	vention]	Favors[co	ontrol]		

Supplemental Fig.13 Impact of carbohydrate-restricted diets on lipid profiles in dyslipidemic individuals with overweight and obesity. Examining the effect of carbohydrate-restricted diets on profiles at intervention conclusion compared to normal carbohydrate diets in dyslipidemic individuals with overweight and obesity across all included RCTs. Random effects model was employed based on the DerSimonian and Laird (DL) method. A) Total cholesterol; B) Triglycerides; C) HDL-C; D) LDL-C; E) ApoB.

WMD (Weighted Mean Difference) reveals the percentage mean difference at intervention conclusion between experimental and control groups. Data points denote mean differences, and horizontal error bars show 95% confidence intervals. Shaded areas reflect study weights in the random-effects meta-analysis. The vertical dashed line marks the pooled point estimate, while the solid black line represents the null hypothesis (MD=0). Red diamonds signify subgroup and overall effects, accompanied by a red solid line indicating the prediction interval. Abbreviation: HDL-C: High-Density Lipoprotein Cholesterol; LDL-C: Low-Density Lipoprotein Cholesterol; ApoB: Apolipoprotein B; RCTs: Randomized Controlled Trials.

A) Fasting glucose

	Experimental			Control									
Study	Total	Mean	SD	Total	Mean	SD		Mea	n Diffe	rence	WMD	95%CI	Weight
Jenkins et al., 2014 Maki et al. 2017	20	82.80	9.61	19	82.80	3.73		-			0.00	[-4.53; 4.53] [-1.28: 1.48]	20.6%
Volek et al., 2009	20	89.00	8.00	20	94.00	9.00			Ŧ		-5.00	[-10.28; 0.28]	16.3%
Random effects model Prediction interval	65	n = 0.1	0	64		I	Г		+	-	-0.75	[-3.15; 1.64] [-24.06; 22.55]	100.0%
Test for overall effect: z = -	0.62 (p	p = 0.1 p = 0.54	9			-1 Fi	0 avors	-5 [interve	0 ention]	5 Favors[c	10 ontrol]		

B) Fasting insulin



Supplemental Fig.14 Impact of carbohydrate-restricted diets on glucose parameters in dyslipidemic individuals with overweight and obesity. Examining the effect of carbohydrate-restricted diets on glucose parameters at intervention conclusion compared to normal carbohydrate diets in dyslipidemic individuals with overweight and obesity across all included RCTs. Random effects model was employed based on the DerSimonian and Laird (DL) method. A) Fasting glucose; B) Fasting insulin.

WMD (Weighted Mean Difference) reveals the percentage mean difference at intervention conclusion between experimental and control groups. Data points denote mean differences, and horizontal error bars show 95% confidence intervals. Shaded areas reflect study weights in the random-effects meta-analysis. The vertical dashed line marks the pooled point estimate, while the solid black line represents the null hypothesis (MD=0). Red diamonds signify subgroup and overall effects, accompanied by a red solid line indicating the prediction interval. Abbreviation: RCTs: Randomized Controlled Trials.