

Supplementary Materials

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Table S1 PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Page 1
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Page 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Page 4-6
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Page 4-6
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Table S3
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Page 6
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Table S2
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Table S3
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Page 6-8
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Page 6-8
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Page 6-8
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Page 8-9
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Page 9-10
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Page 9-10
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Page 9-10
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Page 9-10
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Page 9-10
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Page 9-10
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Page 9-10
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Figure 3
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Table S7
RESULTS			

Section and Topic	Item #	Checklist item	Location where item is reported
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Figure 1
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Table S4
Study characteristics	17	Cite each included study and present its characteristics.	Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Figure 3
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Figure S3 and S4
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Figure S3 and S4
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Figure S3 and S4
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Figure S3 and S4
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Figure S3 and S4
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Figure S3 and S4
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Table S7
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Page 16-21
	23b	Discuss any limitations of the evidence included in the review.	Page 16-21
	23c	Discuss any limitations of the review processes used.	Page 16-21
	23d	Discuss implications of the results for practice, policy, and future research.	Page 16-21
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Page 6-7
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Page 6-7
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Page 6-7
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Page 22
Competing interests	26	Declare any competing interests of review authors.	Page 22
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Page 22

Table S2 Search strategy

PubMed

Dapagliflozin

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])))) AND ((("dapagliflozin" [Supplementary Concept]) OR (((((((((2S,3R,4R,5S,6R)-2-(4-chloro-3-(4-ethoxybenzyl)phenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol[Title/Abstract]) OR (Farxiga[Title/Abstract])) OR (Forxiga[Title/Abstract])) OR (2-(3-(4-ethoxybenzyl)-4-chlorophenyl)-6-hydroxymethyltetrahydro-2H-pyran-3,4,5-triol[Title/Abstract])) OR (BMS 512148[Title/Abstract])) OR (BMS512148[Title/Abstract])) OR (BMS-512148[Title/Abstract]))))

Empagliflozin

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])))) AND ((("empagliflozin" [Supplementary Concept]) OR (((((((1-chloro-4-(glucopyranos-1-yl)-2-(4-(tetrahydrofuran-3-yloxy)benzyl)benzene[Title/Abstract]) OR (BI 10773[Title/Abstract])) OR (BI10773[Title/Abstract])) OR (BI-10773[Title/Abstract])) OR (Jardiance[Title/Abstract]))))

Ipragliflozin

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])))) AND ((("ipragliflozin" [Supplementary Concept]) OR (((((((1S)-1,5-anhydro-1-(3-(1-benzothiophen-2-ylmethyl)-4-fluorophenyl)-D-glucitol[Title/Abstract]) OR (Suglat[Title/Abstract])) OR (ASP1941[Title/Abstract])) OR (ASP-1941[Title/Abstract]))))

Liraglutide

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])))) AND (((("Liraglutide"[Mesh]) OR ((((((Victoza[Title/Abstract]) OR (Saxenda[Title/Abstract])) OR (NN 2211[Title/Abstract])) OR (2211, NN[Title/Abstract])) OR (NN2211[Title/Abstract])) OR (NN-2211[Title/Abstract]))))

Semaglutide

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])))) AND (((("semaglutide" [Supplementary Concept]) OR ((rybelsus[Title/Abstract]) OR (Ozempic[Title/Abstract]))))

Pioglitazone

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])))) AND (((("Pioglitazone"[Mesh]) OR (((((((((((5-(4-(2-(5-Ethyl-2-pyridyl)ethoxy)benzyl)-2,4-thiazolidinedione[Title/Abstract]) OR (U 72107A[Title/Abstract])) OR (U72,107A[Title/Abstract])) OR (U-72107A[Title/Abstract])) OR (U72107A[Title/Abstract])) OR (AD 4833[Title/Abstract])) OR (AD-4833[Title/Abstract])) OR (AD4833[Title/Abstract])) OR (Pioglitazone Hydrochloride[Title/Abstract])) OR (Actos[Title/Abstract]))))

Rosiglitazone

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])) AND (((("Rosiglitazone"[Mesh]) OR ((((((Rosiglitazone Maleate[Title/Abstract]) OR (5-((4-(2-Methyl-2-(pyridinylamino)ethoxy)phenyl)methyl)-2,4-thiazolidinedione-2-butenedioate[Title/Abstract])) OR (Avandia[Title/Abstract])) OR (BRL 49653[Title/Abstract])) OR (BRL-49653[Title/Abstract])) OR (BRL49653[Title/Abstract]))))

Vitamin E

((("Non-alcoholic Fatty Liver Disease"[Mesh]) OR (((((((((((Non alcoholic Fatty Liver Disease[Title/Abstract]) OR (NAFLD[Title/Abstract])) OR (Nonalcoholic Fatty Liver Disease[Title/Abstract])) OR (Fatty Liver, Nonalcoholic[Title/Abstract])) OR (Fatty Livers, Nonalcoholic[Title/Abstract])) OR (Liver, Nonalcoholic Fatty[Title/Abstract])) OR (Livers, Nonalcoholic Fatty[Title/Abstract])) OR (Nonalcoholic Fatty Liver[Title/Abstract])) OR (Nonalcoholic Fatty Livers[Title/Abstract])) OR (Nonalcoholic Steatohepatitis[Title/Abstract])) OR (Nonalcoholic Steatohepatitides[Title/Abstract])) OR (Steatohepatitides, Nonalcoholic[Title/Abstract])) OR (Steatohepatitis, Nonalcoholic[Title/Abstract])) AND (((("Vitamin E"[Mesh]) OR (alpha tocopherol[Title/Abstract]))

Embase

Dapagliflozin

#3 #1 AND #2

#2 'dapagliflozin'/exp OR '(2S,3R,4R,5S,6R)-2-(4-chloro-3-(4-ethoxybenzyl)phenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol':ab,ti OR Farxiga:ab,ti OR Forxiga:ab,ti OR '2-(3-(4-ethoxybenzyl)-4-chlorophenyl)-6-hydroxymethyltetrahydro-2H-pyran-3,4,5-triol':ab,ti OR 'BMS 512148':ab,ti OR BMS512148:ab,ti OR 'BMS-512148':ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Empagliflozin

#3 #1 AND #2

#2 'empagliflozin'/exp OR '1-chloro-4-(glucopyranos-1-yl)-2-(4-(tetrahydrofuran-3-yloxy)benzyl)benzene':ab,ti OR 'BI 10773':ab,ti OR BI10773:ab,ti OR 'BI-10773':ab,ti OR Jardiance:ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Ipragliflozin

#3 #1 AND #2

#2 'ipragliflozin'/exp OR '(1S)-1,5-anhydro-1-(3-(1-benzothiophen-2-ylmethyl)-4-fluorophenyl)-D-glucitol':ab,ti OR Suglat:ab,ti OR ASP1941:ab,ti OR 'ASP-1941':ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Liraglutide

#3 #1 AND #2

#2 'liraglutide'/exp OR Victoza:ab,ti OR Saxenda:ab,ti OR 'NN 2211':ab,ti OR '2211, NN':ab,ti OR NN2211:ab,ti OR 'NN-2211':ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Semaglutide

#3 #1 AND #2

#2 'semaglutide'/exp OR rybelsus:ab,ti OR Ozempic:ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Pioglitazone

#3 #1 AND #2

#2 'pioglitazone'/exp OR '5-(4-(2-(5-Ethyl-2-pyridyl)ethoxy)benzyl)-2,4-thiazolidinedione':ab,ti OR 'U 72107A':ab,ti OR 'U72,107A':ab,ti OR 'U-72107A':ab,ti OR U72107A:ab,ti OR 'AD 4833':ab,ti OR 'AD-4833':ab,ti OR AD4833:ab,ti OR 'Pioglitazone Hydrochloride':ab,ti OR Actos:ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Rosiglitazone

#3 #1 AND #2

#2 'rosiglitazone'/exp OR 'Rosiglitazone Maleate':ab,ti OR '5-((4-(2-Methyl-2-(pyridinylamino)ethoxy)phenyl)methyl)-2,4-thiazolidinedione-2-butenedioate':ab,ti OR Avandia:ab,ti OR 'BRL 49653':ab,ti OR 'BRL-49653':ab,ti OR BRL49653:ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Vitamin E

#3 #1 AND #2

#2 'alpha tocopherol'/exp OR 'Vitamin E':ab,ti

#1 'nonalcoholic fatty liver'/exp OR 'Non-alcoholic Fatty Liver Disease':ab,ti OR 'Non alcoholic Fatty Liver Disease':ab,ti OR NAFLD:ab,ti OR 'Nonalcoholic Fatty Liver Disease':ab,ti OR 'Fatty Liver, Nonalcoholic':ab,ti OR 'Fatty Livers, Nonalcoholic':ab,ti OR 'Liver, Nonalcoholic Fatty':ab,ti OR 'Livers, Nonalcoholic Fatty':ab,ti OR 'Nonalcoholic Fatty Liver':ab,ti OR 'Nonalcoholic Fatty Livers':ab,ti OR 'Nonalcoholic Steatohepatitis':ab,ti OR 'Nonalcoholic Steatohepatitides':ab,ti OR 'Steatohepatitides, Nonalcoholic':ab,ti OR 'Steatohepatitis, Nonalcoholic':ab,ti

Cochrane library

Dapagliflozin

#3 #1 AND #2

#2 (dapagliflozin OR Farxiga OR Forxiga OR BMS 512148 OR BMS512148 OR BMS-512148):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Empagliflozin

#3 #1 AND #2

#2 (empagliflozin OR BI 10773 OR BI10773 OR BI-10773 OR Jardiance):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Ipragliflozin

#3 #1 AND #2

#2 (ipragliflozin OR Suglat OR ASP1941 OR ASP-1941):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Liraglutide

#3 #1 AND #2

#2 (Liraglutide OR Victoza OR Saxenda OR NN 2211 OR 2211, NN OR NN2211 OR NN-2211):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Semaglutide

#3 #1 AND #2

#2 (semaglutide OR rybelsus OR Ozempic):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Pioglitazone

#3 #1 AND #2

#2 (Pioglitazone OR U 72107A OR U72,107A OR U-72107A OR U72107A OR AD 4833 OR AD-4833 OR AD4833 OR Pioglitazone Hydrochloride OR Actos):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Rosiglitazone

#3 #1 AND #2

#2 (Rosiglitazone OR Rosiglitazone Maleate OR Avandia OR BRL 49653 OR BRL-49653 OR BRL49653):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Vitamin E

#3 #1 AND #2

#2 (Vitamin E OR alpha tocopherol):ti,ab,kw

#1 (Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic):ti,ab,kw

Web of Science

Dapagliflozin

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(dapagliflozin OR (2S,3R,4R,5S,6R)-2-(4-chloro-3-(4-ethoxybenzyl)phenyl)-6-(hydroxymethyl)tetrahydro-2H-pyran-3,4,5-triol OR Farxiga OR Forxiga OR 2-(3-(4-ethoxybenzyl)-4-chlorophenyl)-6-hydroxymethyltetrahydro-2H-pyran-3,4,5-triol OR BMS 512148 OR BMS512148 OR BMS-512148)

Empagliflozin

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(empagliflozin OR 1-chloro-4-(glucopyranos-1-yl)-2-(4-(tetrahydrofuran-3-yloxy)benzyl)benzene OR BI 10773 OR BI10773 OR BI-10773 OR Jardiance)

Ipragliflozin

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(ipragliflozin OR (1S)-1,5-anhydro-1-(3-(1-benzothiophen-2-ylmethyl)-4-fluorophenyl)-D-glucitol OR Suglat OR ASP1941 OR ASP-1941)

Liraglutide

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(Liraglutide OR Victoza OR Saxenda OR NN 2211 OR 2211, NN OR NN2211 OR NN-2211)

Semaglutide

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(semaglutide OR rybelsus OR Ozempic)

Pioglitazone

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(Pioglitazone OR 5-(4-(2-(5-Ethyl-2-pyridyl)ethoxy)benzyl)-2,4-thiazolidinedione OR U 72107A OR U72,107A OR U-72107A OR U72107A OR AD 4833 OR AD-4833 OR AD4833 OR Pioglitazone Hydrochloride OR Actos)

Rosiglitazone

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(Rosiglitazone OR Rosiglitazone Maleate OR 5-((4-(2-Methyl-2-(pyridinylamino)ethoxy)phenyl)methyl)-2,4-thiazolidinedione-2-butenedioate OR Avandia OR BRL 49653 OR BRL-49653 OR BRL49653)

Vitamin E

TS=(Non-alcoholic Fatty Liver Disease OR Non alcoholic Fatty Liver Disease OR NAFLD OR Nonalcoholic Fatty Liver Disease OR Fatty Liver, Nonalcoholic OR Fatty Livers, Nonalcoholic OR Liver, Nonalcoholic Fatty OR Livers, Nonalcoholic Fatty OR Nonalcoholic Fatty Liver OR Nonalcoholic Fatty Livers OR Nonalcoholic Steatohepatitis OR Nonalcoholic Steatohepatitides OR Steatohepatitides, Nonalcoholic OR Steatohepatitis, Nonalcoholic) AND TS=(Vitamin E OR alpha tocopherol)

Table S3 Eligibility criteria

PICOS	Inclusion criteria	Exclusion criteria
Population	Adult patients, with or without diabetes mellitus, diagnosed with non-alcoholic fatty liver disease (NAFLD) or non-alcoholic steatohepatitis (NASH).	Subjects were children or pregnant women; Non-NAFLD or non-NASH patients.
Intervention	GLP-1RA, SGLT-2I, TZDs, Vitamin E.	The study included only one or none of the four strategies.
Comparison	Another active control (GLP-1RA, SGLT-2I, TZDs, Vitamin E) or placebo control.	Other drug controls.
Outcome	1. Anthropometric outcomes: BMI and WC. 2. Biological outcomes: ALT, AST, TC, TG, LDL-C, HbA1c, FPG and HOMA-IR. 3. Non-invasive technique-based outcomes: hepatic fat content measured by ¹H-MRS and MRI-PDFF. 4. Liver biopsy-based outcomes: resolution of NASH, steatosis, fibrosis and NAS.	Unable to extract available data.
Study Design	Randomized controlled trials.	Non-experimental, single-arm, qualitative or retrospective studies.

Table S4 Description of excluded studies

Title	Year	DOI	Reasons for exclusion
Empagliflozin Effectively Lowers Liver Fat Content in Well-Controlled Type 2 Diabetes: A Randomized, Double-Blind, Phase 4, Placebo-Controlled Trial	2020	https://doi.org/10.2337/dc19-0641	Incorrect patient population
Vitamin E Supplementation for Treatment of Statin Induced Hepatocellular Damage: A Randomized, Double-Blind, Placebo-Controlled Trial	2018	NA	Incorrect patient population
Placebo-controlled randomised trial with liraglutide on magnetic resonance endpoints in individuals with type 2 diabetes: a pre-specified secondary study on ectopic fat accumulation	2020	https://doi.org/10.1007/s00125-019-05021-6	Incorrect patient population
Effect of canagliflozin treatment on hepatic triglyceride content and glucose metabolism in patients with type 2 diabetes	2019	https://doi.org/10.1111/dom.13584	Incorrect patient population
Investigating the role of vitamin E and metformin in improving fatty liver	2017	NA	Incorrect patient population
Effects of empagliflozin on liver fat content in type 2 diabetes: The emlifa001 trial	2019	https://doi.org/10.2337/db19-133-OR	Incorrect patient population
Empagliflozin effectively lowers hepatic steatosis and improves hepatocellular integrity in patients with well-controlled type 2 diabetes	2019	https://doi.org/10.1159/000500886	Incorrect patient population
Empagliflozin effectively reduces liver fat content in type 2 diabetes	2019	https://doi.org/10.1055/s-0039-1688168	Incorrect patient population
Effects of empagliflozin on markers of liver steatosis and fibrosis and their relationship to cardiorenal outcomes	2022	https://doi.org/10.1111/dom.14670	Incorrect patient population
Liraglutide treatment improves postprandial lipid metabolism and cardiometabolic risk factors in humans with adequately controlled type 2 diabetes: a single-centre randomized controlled study	2019	https://doi.org/10.1111/dom.13487	Incorrect patient population
Dapagliflozin Reduces Intrahepatic Triglyceride Content in Japanese Patients with Type 2 Diabetes Treated with Oral Antidiabetic Agents: A Randomized, Clinical Trial	2019	https://doi.org/10.2337/db19-1192-P	Incorrect patient population
Effects of Cotadutide on Metabolic and Hepatic Parameters in Adults With Overweight or Obesity and Type 2 Diabetes: a 54-Week Randomized Phase 2b Study	2021	https://doi.org/10.2337/dc20-2151	Incorrect patient population
Effects of Empagliflozin on Liver Fat Content, Energy Metabolism and Body Composition in Patients With Type 2 Diabetes	2015	NA	Incorrect patient population
Effect of semaglutide on alanine aminotransferase in subjects with type 2 diabetes and high cardiovascular risk	2017	NA	Incorrect patient population
Twelve week liraglutide or sitagliptin does not affect hepatic fat in type 2 diabetes: a randomised placebo-controlled trial	2016	https://doi.org/10.1007/s00125-016-4100-7	Incorrect patient population
Effect of ipragliflozin on liver function in Japanese type 2 diabetes mellitus patients: a subgroup analysis of the STELLA-LONG TERM study (3-month interim results)	2019	https://doi.org/10.1507/endocrj.EJ18-0217	Incorrect patient population
Rosiglitazone improves postprandial triglyceride and free fatty acid metabolism in type 2 diabetes	2005	https://doi.org/10.2337/diacare.28.4.844	Incorrect patient population
Mechanisms of Action of Liraglutide in Patients With Type 2 Diabetes Treated With High-Dose Insulin	2016	https://doi.org/10.1210/jc.2015-3906	Incorrect patient population
Remogliflozin etabonate reduces insulin resistance and liver function enzymes: role for treatment of NASH	2015	https://doi.org/10.1016/S0168-8278(15)30055-6	Incorrect patient population
The Effectiveness of Liraglutide in Nonalcoholic Fatty Liver Disease Patients with Type 2 Diabetes Mellitus Compared to Sitagliptin and Pioglitazone	2012	https://doi.org/10.1100/2012/496453	Not a RCT
A pilot study of a thiazolidinedione, pioglitazone, in nonalcoholic steatohepatitis	2002	NA	Not a RCT
Diverging effects on serum lipid and liver enzymes of rosiglitazone vs pioglitazone in a patient with partial lipodystrophy, extreme insulin resistance and NAFLD	2008	NA	Not a RCT

55 metabolic and anti-inflammatory beneficial effects of pioglitazone (pio) treatment in patients with non-alcoholic steatohepatitis (nash) and their associations with histological improvement	2009	https://doi.org/10.1016/S0168-8278(09)60057-X	Not a RCT
Liraglutide improves carotid intima-media thickness in patients with type 2 diabetes and non-alcoholic fatty liver disease: an 8-month prospective pilot study	2014	NA	Not a RCT
Vitamin e, pioglitazone and diet therapy for patients with nonalcoholic fatty liver disease (nafld): evaluation of treatment	2012	https://doi.org/10.1016/S0168-8278(12)61297-5	Not a RCT
Pharmacodynamic association of pioglitazone and its active metabolites with liver outcomes among patients diagnosed with nonalcoholic steatohepatitis	2014	https://doi.org/10.1038/clpt.2013.247	Not a RCT
Control of oxidative stress and reduction in biochemical markers by Vitamin E treatment in patients with nonalcoholic steatohepatitis: a pilot study	2004	https://doi.org/10.1016/j.hepres.2004.02.002	Not a RCT
A pilot study of empagliflozin for the treatment of non-alcoholic steatohepatitis in patients with type 2 diabetes mellitus	2018	https://doi.org/10.1016/S0168-8278(18)30438-0	Not a RCT
Vitamin E effective for nonalcoholic steatohepatitis	2010	https://doi.org/10.1097/01.NMD.0000384100.81427.c1	Not a RCT
Efficacy and safety of long-term oral administration of pioglitazone for treatment of nonalcoholic fatty liver disease	2008	https://doi.org/10.14309/00000434-200809001-00317	Not a RCT
A pilot study of pioglitazone treatment for nonalcoholic steatohepatitis	2004	https://doi.org/10.1002/hep.20012	Not a RCT
Sodium-glucose Cotransporter 2 Inhibitors and Nonalcoholic Fatty Liver Disease	2022	https://doi.org/10.1016/j.hfc.2022.03.011	Not a RCT
Visualization of mechanism of action, and a further therapeutic potential of ipragliflozin, a selective SGLT2 inhibitor	2016	https://doi.org/10.1254/fpj.148.266	Not a RCT
Long-Term Pioglitazone Treatment for Patients With Nonalcoholic Steatohepatitis	2017	https://doi.org/10.7326/L16-0628	Not a RCT
Effect of vitamin E to basal energy expenditure in NAFLD patients	2017	NA	Not a RCT
Efficacy of low dose pioglitazone in Japanese patients with nonalcoholic fatty liver disease	2008	NA	Not a RCT
Vitamin E versus placebo for the treatment of non diabetic patients with nonalcoholic steatohepatitis in China	2017	https://doi.org/10.1007/s12072-016-9783-9	Not a RCT
Po22-717 beyond glycated haemoglobin: effectiveness of rosiglitazone in type-2 diabetes with hypertension and non-alcoholic fatty liver. A randomized controlled one-year study	2007	https://doi.org/10.1016/S1567-5688(07)71727-0	Incorrect intervention or comparator
The effect of microalgae chlorella vulgaris supplementation on inflammatory factors in non-alcoholic fatty liver disease: a doubleblind randomized clinical trial	2014	NA	Incorrect intervention or comparator
132-OR: Effects of Dapagliflozin, an SGLT2 Inhibitor, on Hepatic Steatosis and Fibrosis Evaluated by Transient Elastography in Patients with Type 2 Diabetes and Nonalcoholic Fatty Liver Disease	2019	https://doi.org/10.2337/db19-132-OR	Incorrect intervention or comparator
Impact of dapagliflozin, an SGLT2 inhibitor, on serum levels of soluble dipeptidyl peptidase - 4 in patients with type 2 diabetes and non - alcoholic fatty liver disease	2019	https://doi.org/10.1111/ijcp.13335	Incorrect intervention or comparator
Study on the nutritional therapy strategy of non-alcoholic fatty liver disease	2012	NA	Incorrect intervention or comparator
The effects of dihydromyricetin on patient with non-alcoholic fatty liver disease	2012	NA	Incorrect intervention or comparator
The effects of reveratrol on patient with non-alcoholic fatty liver disease	2012	NA	Incorrect intervention or comparator

Effect of dapagliflozin on liver and pancreatic fat in patients with type 2 diabetes and nonalcoholic fatty liver disease	2021	NA	Incorrect intervention or comparator
Effect and mechanism of dapagliflozin on patients with type 2 diabetes complicated with nonalcoholic fatty liver disease	2022	NA	Incorrect intervention or comparator
Favorable effect of sodium-glucose cotransporter 2 inhibitor, dapagliflozin, on non-alcoholic fatty liver disease compared with pioglitazone	2021	https://doi.org/10.1111/jdi.13457	Incorrect intervention or comparator
Ipragliflozin Additively Ameliorates Non-Alcoholic Fatty Liver Disease in Patients with Type 2 Diabetes Controlled with Metformin and Pioglitazone: A 24-Week Randomized Controlled Trial	2020	https://doi.org/10.3390/jcm9010259	Incorrect intervention or comparator
Vitamin E and vitamin C in the treatment of non-alcoholic steatohepatitis. A prospective, randomized, placebo-controlled clinical trial. A preliminary report	2002	NA	Incorrect intervention or comparator
Mechanisms of action of hypoglycemic drugs in nonalcoholic fatty liver disease (NAFLD)	2013	NA	Incorrect intervention or comparator
Pharmacometabolomic profiles in type 2 diabetic subjects treated with liraglutide or glimepiride	2021	https://doi.org/10.1186/s12933-021-01431-2	Incorrect intervention or comparator
Dapagliflozin Improves Liver Dysfunction in Parallel with a Decrease in Serum Soluble DPP-4/CD26 Level in Type 2 Diabetic Patients with Nonalcoholic Fatty Liver Disease	2019	https://doi.org/10.2337/db19-1229-P	Incorrect intervention or comparator
A pilot randomized controlled trial (RCT) of 26 weeks of lifestyle modifications (LM) versus. liraglutide (LG) in reducing severity of nonalcoholic steatohepatitis (NASH) in Asian adults	2017	https://doi.org/10.1111/jgh.13878	Incorrect intervention or comparator
Dapagliflozin significantly reduced liver fat accumulation associated with a decrease in abdominal subcutaneous fat in patients with inadequately controlled type 2 diabetes mellitus	2018	https://doi.org/10.1016/j.diabres.2018.05.017	Incorrect intervention or comparator
Role of Pioglitazone and Berberine in Treatment of Non-Alcoholic Fatty Liver Disease	2008	NA	Incorrect intervention or comparator
Effects of Rosiglitazone and Alpha-lipoic Acid on the Patients With Pathologically Proved NASH	2011	NA	Incorrect intervention or comparator
Effect of Empagliflozin on Liver Fat Content in Patients With Type 2 Diabetes	2016	NA	Incorrect intervention or comparator
Effects of Ipragliflozin on Excessive Fat in Type 2 Diabetes Patients With Non-alcoholic Fatty Liver Disease Treated With Metformin and Pioglitazone	2016	NA	Incorrect intervention or comparator
Placebo-controlled, Proof-of-concept Study to Evaluate the Safety and Efficacy of Lanifibranor Alone and in Combination With SGLT2 Inhibitor Empagliflozin in patients With NASH and Type 2 Diabetes Mellitus	2022	NA	Incorrect intervention or comparator
Effect of liraglutide therapy on hepatic steatosis and liver stiffness in patients with nonalcoholic fatty liver disease	2020	https://doi.org/10.1007/s12072-020-10030-4	Incorrect intervention or comparator
Effect of dapagliflozin on liver and pancreatic fat in patients with type 2 diabetes and non-alcoholic fatty liver disease	2023	https://doi.org/10.1016/j.jdiacomp.2023.108610	Incorrect intervention or comparator
Evaluation of the effects of dapagliflozin, a sodium - glucose co - transporter - 2 inhibitor, on hepatic steatosis and fibrosis using transient elastography in patients with type 2 diabetes and non - alcoholic fatty liver disease	2019	https://doi.org/10.1111/dom.13520	Incorrect intervention or comparator
Ipragliflozin ameliorated overweight and pathological liver fibrosis in diabetic patients with nonalcoholic fatty liver disease in a multicenter randomized controlled trial	2020	https://doi.org/10.2337/db20-31-OR	Incorrect intervention or comparator
Therapeutic efficacy of Pioglitazone for Non-Alcoholic Fatty Liver Disease(NAFLD) patients with impaired glucose tolerance or type 2 diabetes	2008	NA	Incorrect intervention or comparator
Therapeutic effect of liraglutide on type 2 diabetic patients with nonalcoholic fatty liver disease	2023	https://doi.org/10.23736/S2724-5691.21.09335-7	Incorrect intervention or comparator
A randomized, double blind, placebo controlled trial of one year of pioglitazone in non-diabetic subjects with nonalcoholic steatohepatitis	2007	NA	Secondary publication of included trial

Liraglutide is effective in the histological clearance of non-alcoholic steatohepatitis in a multicentre, double-blinded, randomised, placebo-controlled phase II trial	2015	https://doi.org/10.1136/gutjnl-2015-309861.16	Secondary publication of included trial
Clinical Trial Report: Treatment of Nonalcoholic Steatohepatitis with Vitamin E	2011	https://doi.org/10.1007/s11894-010-0162-8	Secondary publication of included trial
Safety of statin therapy in patients with prediabetes or T2DM and NASH: a long-term prospective study	2013	https://doi.org/10.2337/db13-388-679	Secondary publication of included trial
Predictors of response after extended pioglitazone treatment in patients with prediabetes or T2DM and nonalcoholic steatohepatitis (NASH)	2013	https://doi.org/10.1002/hep.26849	Secondary publication of included trial
Is treatment of nonalcoholic steatohepatitis with pioglitazone equally effective in patients with prediabetes compared with type 2 diabetes (T2DM)?	2017	NA	Secondary publication of included trial
Role of Vitamin E for the Treatment of Nonalcoholic Steatohepatitis (NASH) in Patients with T2DM—A Randomized, Controlled Trial	2018	https://doi.org/10.2337/db18-1223-P	Secondary publication of included trial
Empagliflozin reduziert Leberfett bei Patienten mit Typ-2-Diabetes und NAFLD	2018	https://doi.org/10.1055/a-0642-4623	Secondary publication of included trial
Liraglutide safety and efficacy in patients with non-alcoholic steatohepatitis (LEAN): a multicentre, double-blind, randomized, placebo-controlled phase 2 study	2016	https://doi.org/10.1177/0004563216648250	Secondary publication of included trial
Intervention study of liraglutide in type 2 diabetes mellitus with nonalcoholic fats	2020	NA	Secondary publication of included trial
Safety and Efficacy of Long-Term Pioglitazone Treatment for Patients With Prediabetes or T2DM and NASH	2013	https://doi.org/10.2337/db13-859-1394	Secondary publication of included trial
Extended treatment with pioglitazone improves liver histology in patients with prediabetes or type 2 diabetes mellitus and NASH	2013	https://doi.org/10.1002/hep.26804	Secondary publication of included trial
Metabolic factors associated with NASH in a predominantly obese hispanic population	2011	https://doi.org/10.1038/oby.2011.226	Secondary publication of included trial
Semaglutide or Placebo for Nonalcoholic Steatohepatitis	2021	https://doi.org/10.1056/NEJMc2106921	Secondary publication of included trial
Semaglutide is safe and efficacious for NASH resolution	2021	https://doi.org/10.1038/s41575-020-00396-z	Secondary publication of included trial
Vitamin E for nonalcoholic steatohepatitis: Ready for prime time?	2010	https://doi.org/10.1002/hep.23817	Secondary publication of included trial
A double-blind randomized placebo-controlled, parallel-group study during 12 weeks to investigate whether the drugs Epanova® and dapagliflozin can diminish the liver fat content in patients with diabetes type 2	2014	NA	Secondary publication of included trial
Semaglutide treatment in subjects with NAFLD: effects assessed by magnetic resonance elastography and magnetic resonance imaging proton density fat fraction	2020	https://doi.org/10.1002/hep.31579	Secondary publication of included trial
Adipose-tissue insulin resistance is a major metabolic abnormality of patients with IGT/T2DM and NASH: Reversal with pioglitazone treatment	2007	NA	Secondary publication of included trial
Effect of dietary intervention or pioglitazone therapy on hepatic and visceral fat, insulin resistance and liver histology in patients with NASH	2017	https://doi.org/10.1097/01.XCE.0000523561.66739.36	Secondary publication of included trial
PPAR-γ-induced changes in visceral fat and adiponectin levels are associated with improvement of steatohepatitis in patients with NASH	2021	https://doi.org/10.1111/liv.15005	Secondary publication of included trial
Relationship of ELF and PIINP With Liver Histology and Response to Vitamin E or Pioglitazone in the PIVENS Trial	2021	https://doi.org/10.1002/hep4.1680	Secondary publication of included trial
Effect of subcutaneous semaglutide on features of the metabolic syndrome in patients with nonalcoholic steatohepatitis	2021	https://doi.org/10.1002/hep.32188	Secondary publication of included trial
Effect of subcutaneous semaglutide on features of the metabolic syndrome in patients with non-alcoholic steatohepatitis	2022	https://doi.org/10.1007/s12072-022-10337-4	Secondary publication of included trial

A double-blind, placebo-controlled trial of pioglitazone in the treatment of non-alcoholic steatohepatitis (NASH)	2005	NA	Secondary publication of included trial
A double-blind, randomized, placebo-controlled, phase II study to assess the efficacy and safety of insulin sensitizer in patients with nonalcoholic steatohepatitis in Asia— an interim report	2020	https://doi.org/10.1007/s12072-020-10030-4	Secondary publication of included trial
Effect of Vitamin E and Pioglitazone in patients with non-alcoholic fatty liver disease	2017	NA	Secondary publication of included trial
Effect of metformin, pioglitazone and vitamin E in patients with non-alcoholic fatty liver disease	2016	NA	Secondary publication of included trial
The therapeutic effect of Melatonin, Metformin and Vitamin E in patients with non-alcoholic fatty liver disease	2017	NA	Secondary publication of included trial
The effect of empagliflozin on nonalcoholic fatty liver disease in diabetic patients	2019	NA	Secondary publication of included trial
The effect of Empagliflozin on nonalcoholic fatty liver disease in non-diabetic patients	2019	NA	Secondary publication of included trial
The cardiac effect of pioglitazone and empagliflozin among diabetic patients with NAFLD	2020	NA	Secondary publication of included trial
Randomised double-blind placebo controlled trial of treatment with pioglitazone in non-alcoholic steatohepatitis	2003	NA	Secondary publication of included trial
Dapagliflozin therapy in type 2 diabetes patients with nonalcoholic fatty liver disease	2018	https://doi.org/10.1007/s11428-018-0401-4	Secondary publication of included trial
Effects of different types of oral glucose-lowering drugs on hepatic fat accumulation and liver function in Japanese subjects with type 2 diabetes mellitus and nonalcoholic fatty liver disease-a randomized, open-label, 3-arm active-control study	2018	https://doi.org/10.2337/db18-2050-P	Secondary publication of included trial
A molecular analysis of the hepatoprotective effects of rosiglitazone in human nash: results from the flirt trial	2008	NA	Secondary publication of included trial
Effectiveness and safety of semaglutide in nonalcoholic steatohepatitis investigated	2021	https://doi.org/10.1055/a-1491-9899	Secondary publication of included trial
Effect of pioglitazone therapy on insulin secretion and insulin clearance in patients with nonalcoholic steatohepatitis (NASH)	2013	https://doi.org/10.2337/db13-1825-2160	Secondary publication of included trial
Semaglutide 2.4 mg once weekly improved liver and metabolic parameters, and was well tolerated, in patients with non-alcoholic steatohepatitis-related cirrhosis: a randomised, placebo-controlled phase 2 trial	2022	https://doi.org/10.1016/S0168-8278(22)00440-8	Secondary publication of included trial
Utility of a combination of noninvasive biomarkers (fibromax) in assessing the efficacy of rosiglitazone in a one year randomized, double-blind trial in non alcoholic steatohepatitis	2007	https://doi.org/10.1016/S0168-8278(07)62353-8	Secondary publication of included trial
Pioglitazone vs Vitamin E vs Placebo for Treatment of Non-Diabetic Patients With Nonalcoholic Steatohepatitis (PIVENS)	2003	NA	Secondary publication of included trial
Role of Pioglitazone in the Treatment of Non-alcoholic Steatohepatitis (NASH)	2005	NA	Secondary publication of included trial
A One-Year, Randomized, Double-Blind, Placebo-Controlled Trial of Rosiglitazone in Non-Alcoholic Steatohepatitis	2007	NA	Secondary publication of included trial
Prevalence of Non-alcoholic Fatty Liver Disease (NAFLD) in Hispanics With Diabetes Mellitus Type 2 (T2DM) and Role of Treatment	2009	NA	Secondary publication of included trial
University of Texas H.S.C. San Antonio Pioglitazone in Non-Alcoholic Steatohepatitis Trial (UTHSCSA NASH Trial)	2009	NA	Secondary publication of included trial
Liraglutide Efficacy and Action in Non-Alcoholic Steatohepatitis	2010	NA	Secondary publication of included trial

The Efficacy and Safety of Pioglitazone in Patients With Nonalcoholic Steatohepatitis	2010	NA	Secondary publication of included trial
Investigation of Efficacy and Safety of Three Dose Levels of Subcutaneous Semaglutide Once Daily Versus Placebo in Subjects With Non-alcoholic Steatohepatitis	2016	NA	Secondary publication of included trial
A Study on How Semaglutide Works on Early Stages of Scar Tissue in the Liver Assessed by Pictures of the Liver	2017	NA	Secondary publication of included trial
A Research Study on How Semaglutide Works in People With Fatty Liver Disease and Liver Damage	2019	NA	Secondary publication of included trial
Changes in alt and vitamin e levels and histological response in patients with nash treated with vitamin e in the pivens trial	2010	NA	Secondary publication of included trial
Efficacy and safety of subcutaneous semaglutide once-daily versus placebo in patients with nonalcoholic steatohepatitis	2020	https://doi.org/10.1002/hep.31578	Secondary publication of included trial
Fibrosis response assessed by enhanced liver fibrosis and FibroScan liver stiffness measurement in patients with nonalcoholic steatohepatitis treated with subcutaneous semaglutide	2022	https://doi.org/10.1007/s12072-022-10337-4	Secondary publication of included trial
Semaglutide or Placebo for Nonalcoholic Steatohepatitis	2021	https://doi.org/10.1056/NEJMc2106921	Secondary publication of included trial
Effects of dapagliflozin, a sodium-glucose co-transporter 2 inhibitor, and free omega-3 carboxylic acids on liver steatosis and hepatocyte damage biomarkers in Type 2 diabetes patients with non-alcoholic fatty liver disease	2016	NA	Secondary publication of included trial
Effect of dapagliflozin on hepatic fat, visceral fat and hepatic inflammatory markers in non-alcoholic fatty liver disease patients with type 2 diabetes	2018	https://doi.org/10.1002/hep.30257	Secondary publication of included trial
Effects of extended pioglitazone treatment (PIO) on bone metabolism in patients with prediabetes and type 2 diabetes mellitus (T2DM)	2014	https://doi.org/10.2337/db14-833-1316	Secondary publication of included trial
Effect of pioglitazone on bone mineral density in patients with nonalcoholic steatohepatitis: A 36-month clinical trial	2019	https://doi.org/10.1111/1753-0407.12833	Secondary publication of included trial
The role of body weight loss as a mediator of histological efficacy of semaglutide in non-alcoholic steatohepatitis	2022	https://doi.org/10.1007/s12072-022-10337-4	Secondary publication of included trial
A one year randomized, placebo-controlled, double-blind trial of rosiglitazone in non-alcoholic steatohepatitis: results of the FLIRT pilot trial	2006	NA	Secondary publication of included trial
738 A one year randomized, placebo-controlled, double-blind trial of rosiglitazone in non-alcoholic steatohepatitis: Results of the flirt pilot trial	2006	https://doi.org/10.1016/S0168-8278(06)80738-5	Secondary publication of included trial
A one-year, randomized, placebo-controlled, double-blind trial of rosiglitazone in non alcoholic steatohepatitis: Results of the FLIRT pilot trial	2006	NA	Secondary publication of included trial
A one year randomized, placebo-controlled, double-blind trial of rosiglitazone in non alcoholic steatohepatitis: Results of the flirt* pilot trial	2006	NA	Secondary publication of included trial
Effect of subcutaneous semaglutide on quality-of-life in patients with non-alcoholic steatohepatitis	2021	NA	Secondary publication of included trial
Improved health - related quality of life with semaglutide in people with non - alcoholic steatohepatitis: A randomised trial	2023	https://doi.org/10.1111/apt.17598	Secondary publication of included trial
A randomized controlled trial of pioglitazone of vitamin E for nonalcoholic steatohepatitis (PIVENS)	2009	NA	Secondary publication of included trial
Do symbiotic and Vitamin E supplementation have favorite effects in nonalcoholic fatty liver disease? A randomized, double-blind, placebo-controlled trial	2019	https://doi.org/10.1111/jgh.14879	Secondary publication of included trial
Pioglitazone therapy improves insulin suppression of branchedchain amino acids in patients with prediabetes or T2DM and NAFLD	2015	https://doi.org/10.2337/db159321471	Secondary publication of included trial

Effect of Dapagliflozin on hepatic fat, visceral fat and hepatic inflammatory makers in non alcoholic fatty liver disease patients with type 2 diabetes	2017	NA	Secondary publication of included trial
Effects of ipragliflozin on nonalcoholic fatty liver disease in patients with type 2 diabetes	2016	NA	Secondary publication of included trial
The effectiveness of oral hypoglycemic agents in nonalcoholic fatty liver disease patients with type 2 diabetes mellitus. -Multiple comparison, Dapagliflozin, Pioglitazone vs Glimepiride	2016	NA	Secondary publication of included trial
Insulin resistance and oxidative stress: two therapeutic targets in non-alcoholic steatohepatitis	2011	https://doi.org/10.1016/j.jhep.2010.07.054	Secondary publication of included trial
Change in fibroscan-aspartate aminotransferase (fast) score is associated with histological improvement in non-alcoholic steatohepatitis activity	2021	https://doi.org/10.1002/hep.32188	Secondary publication of included trial
The first double-blind randomized placebo-controlled phase 2 study to assess the efficacy and safety of insulin sensitizer in patients with non-alcoholic steatohepatitis in Asia- an interim report	2020	https://doi.org/10.1016/S0168-8278(20)31379-9	Secondary publication of included trial
Liraglutide efficacy and action in non-alcoholic steatohepatitis (LEAN): Study protocol for a phase II multicentre, double-blinded, randomised, controlled trial	2013	https://doi.org/10.1136/bmjopen-2013-003995	Duplicate people or data
Pioglitazone versus vitamin E versus placebo for the treatment of non-diabetic patients with non-alcoholic steatohepatitis: PIVENS trial design	2009	https://doi.org/10.1016/j.cct.2008.09.003	Duplicate people or data
Response to Pioglitazone in Patients With Nonalcoholic Steatohepatitis With vs Without Type 2 Diabetes	2018	https://doi.org/10.1016/j.cgh.2017.12.001	Duplicate people or data
Glucagon-like peptide 1 decreases lipotoxicity in non-alcoholic steatohepatitis	2016	https://doi.org/10.1016/j.jhep.2015.08.038	Duplicate people or data
Effect of liraglutide on adipose insulin resistance and hepatic de-novo lipogenesis in non-alcoholic steatohepatitis: substudy of a phase 2, randomised placebo-controlled trial	2014	https://doi.org/10.1016/S0140-6736(14)60284-1	Duplicate people or data
Glucagon like peptide 1 analogue, liraglutide, reduces adipose insulin resistance and hepatic de novo lipogenesis in Nonalcoholic Steatohepatitis: Sub-study results of a phase II randomised-control clinical trial	2013	https://doi.org/10.1002/hep.26849	Duplicate people or data
Metabolic and anti-inflammatory effects of pioglitazone (PIO) lead to histological improvement in patients with non-alcoholic steatohepatitis (NASH)	2006	NA	Duplicate people or data
Pioglitazone treatment increases whole body fat but not total body water in patients with non-alcoholic steatohepatitis	2007	https://doi.org/10.1016/j.jhep.2007.04.013	Duplicate people or data
NASH resolution is associated with improvements in HDL and triglyceride levels but not improvement in LDL or non-HDL-C levels	2015	https://doi.org/10.1111/apt.13035	Duplicate people or data
Effects of symbiotic and vitamin E supplementation on blood pressure, nitric oxide and inflammatory factors in non-alcoholic fatty liver disease	2017	https://doi.org/10.17179/excli2016-846	Duplicate people or data
Importance of changes in adipose tissue insulin resistance to histological response during thiazolidinedione treatment of patients with nonalcoholic steatohepatitis	2009	https://doi.org/10.1002/hep.23116	Duplicate people or data
Pioglitazone in the treatment of NASH: the role of adiponectin	2010	https://doi.org/10.1111/j.1365-2036.2010.04405.x	Duplicate people or data
Use of metabolic syndrome severity to assess treatment with vitamin E and pioglitazone for non-alcoholic steatohepatitis	2021	https://doi.org/10.1111/jgh.15131	Duplicate people or data
Vitamin E and changes in serum alanine aminotransferase levels in patients with non-alcoholic steatohepatitis	2013	https://doi.org/10.1111/apt.12352	Duplicate people or data
Comparison of metformin, pioglitazone and vitamin E on nonalcoholic fatty liver disease	2013	NA	Duplicate people or data
A Genetic Score Associates With Pioglitazone Response in Patients With Non-alcoholic Steatohepatitis	2018	https://doi.org/10.3389/fphar.2018.00752	Duplicate people or data

Long-term efficacy of rosiglitazone in nonalcoholic steatohepatitis (NASH): results of the extension phase of the FLIRT-2 trial	2009	NA	Duplicate people or data
Long-term efficacy of rosiglitazone in nash: results of the extension phase of the flirt-2 trial	2008	NA	Duplicate people or data
Long-term efficacy of rosiglitazone in nonalcoholic steatohepatitis: Results of the fatty liver improvement by rosiglitazone therapy (FLIRT 2) extension trial	2010	https://doi.org/10.1002/hep.23270	Duplicate people or data
Liraglutide improves carotid intima-media thickness in patients with type 2 diabetes and non-alcoholic fatty liver disease: An 8-month prospective pilot study	2014	http://dx.doi.org/10.1007/s00125-014-3355-0	Retracted or terminated
Potent weight loss mechanism and improvement of NASH by the long-acting GLP-1/glucagon receptor dual agonist HM12525A	2015	http://dx.doi.org/10.1007/s00125-015-3687-4	Retracted or terminated
Combination of empagliflozin and linagliptin shows promise in a rodent model of non-alcoholic fatty liver disease	2014	http://dx.doi.org/10.1007/s00125-014-3355-0	Retracted or terminated
Genistein improves liver function and attenuates non-alcoholic fatty liver disease in a rat model of insulin resistance	2009	http://dx.doi.org/10.1111/j.1753-0407.2009.00045.x	Retracted or terminated
Genistein improves liver function and attenuates non-alcoholic fatty liver disease in a rat model of insulin resistance	2009	http://dx.doi.org/10.1111/j.1753-0407.2009.00045.x	Retracted or terminated
Effects of liraglutide vs lifestyle changes on subcutaneous and visceral fat, liver steatosis, insulin sensitivity and beta cell function after comparable weight loss	2015	http://dx.doi.org/10.1007/s00125-015-3687-4	Retracted or terminated
Effects of liraglutide vs lifestyle changes on subcutaneous and visceral fat, liver steatosis, insulin sensitivity and beta cell function after comparable weight loss	2015	http://dx.doi.org/10.1007/s00125-015-3687-4	Retracted or terminated
Comparative efficacy of anti-diabetic agents on nonalcoholic fatty liver disease in patients with type 2 diabetes mellitus: A systematic review and meta-analysis	2015	http://dx.doi.org/10.1007/s00125-015-3687-4	Retracted or terminated
Comparative efficacy of anti-diabetic agents on nonalcoholic fatty liver disease in patients with type 2 diabetes mellitus: A systematic review and meta-analysis	2015	http://dx.doi.org/10.1007/s00125-015-3687-4	Retracted or terminated
Treatment with liraglutide leads to an important reduction in liver fat content, assessed by magnetic resonance spectroscopy, in people with type 2 diabetes	2015	http://dx.doi.org/10.1007/s00125-015-3687-4	Retracted or terminated
An ErChen and YinChen Decoction Ameliorates High-Fat-Induced Nonalcoholic Steatohepatitis in Rats by Regulating JNK1 Signaling Pathway	2017	http://dx.doi.org/10.1155/2017/4603701	Retracted or terminated
Identification of Key Biomarkers and Immune Infiltration in Liver Tissue after Bariatric Surgery	2022	http://dx.doi.org/10.1155/2022/4369329	Retracted or terminated
Comparison of semaglutide, empagliflozin, and their combination on participants with NAFLD and type 2 diabetes	2023	NA	Ongoing trial without reported data
Evaluation of the therapeutic effect of the SGLT-2 inhibitor dapagliflozin on non-alcoholic fatty liver disease	2023	NA	Ongoing trial without reported data
Dapagliflozin is a licensed medicine used for reducing blood sugar in people with diabetes and this study will test whether it can also reduce the stiffness in the liver which commonly occurs in diabetes	2019	NA	Ongoing trial without reported data
A clinical study to compare the efficacy & safety of two drugs- Empagliflozin and Pioglitazone in Non alcoholic fatty liver disease patients with diabetes	2023	NA	Ongoing trial without reported data
Combined Treatment of fatty liver Inflammation and type 2 diabetes	2020	NA	Ongoing trial without reported data
Effect of treatment with Semaglutide on cognitive function, brain inflammation and nitrogen-conversion in the liver in patients with non-alcoholic steatohepatitis: a randomized placebo-controlled trial	2020	NA	Ongoing trial without reported data
Sleeve Procedure vs Liraglutide vs Empagliflozin in NASH Disease and Obesity RCT (SPLENDOR)	2020	NA	Ongoing trial without reported data

Effect of Empagliflozin in diabetic patients with non-alcoholic steatohepatitis	2021	NA	Ongoing trial without reported data
Comparing the effect of Empagliflozin, Pioglitazone and their combination, on the course of non-alcoholic fatty liver disease in diabetic patients	2023	NA	Ongoing trial without reported data
A prospective randomized comparative four arm intervention study of efficacy and safety of saroglitzazar and vitamin e in patients with non-alcoholic fatty liver disease/non-alcoholic steatohepatitis-An interim analysis	2023	https://doi.org/10.1007/s12664-022-01305-9	Ongoing trial without reported data
Dapagliflozin Efficacy and Action in NASH	2018	NA	Ongoing trial without reported data
Vitamin E and DHA-EE on NAFLD - Randomized, Double-Blind, Placebo-Controlled, Parallel-Group Clinical Trial (PUVENAFLD)	2019	NA	Ongoing trial without reported data
Effect of Empagliflozin on Liver Fat in Non-diabetic Patients	2020	NA	Ongoing trial without reported data
Low-Dose Pioglitazone in n Patients With NASH	2020	NA	Ongoing trial without reported data
Research Study on Whether a Combination of 2 Medicines (NNC0194 0499 and Semaglutide) Works in People With Non-alcoholic Steatohepatitis (NASH)	2021	NA	Ongoing trial without reported data
Research Study on Whether Semaglutide Works in People With Non-alcoholic Steatohepatitis (NASH)	2021	NA	Ongoing trial without reported data
Vitamin E Dosing Study	2021	NA	Ongoing trial without reported data
A Single Center, Randomized, Open Label, Parallel Group, Phase 3 Study to Evaluate the Efficacy of Dapagliflozin in Subjects With Nonalcoholic Fatty Liver Disease	2022	NA	Ongoing trial without reported data
Comparative Clinical Study Between Empagliflozin Versus Pioglitazone in Non-diabetic Patients With Non-alcoholic Steatohepatitis	2022	NA	Ongoing trial without reported data
Dapagliflozin in Type 2 Diabetes Mellitus Patients (T2DM) With Nonalcoholic Fatty Liver Disease (NAFLD)	2022	NA	Ongoing trial without reported data
Effect of Canagliflozin on Liver Inflammation Damage in Type 2 Diabetes Patients With Nonalcoholic Fatty Liver Disease	2022	NA	Ongoing trial without reported data
Efficacy and Safety of Dapagliflozin in Patients With Non-alcoholic Steatohepatitis	2022	NA	Ongoing trial without reported data
Effects of GLP-1RA on Body Weight, Metabolism and Fat Distribution in Overweight/Obese Patients With Type 2 Diabetes Mellitus	2023	NA	Ongoing trial without reported data
Efficacy of Empagliflozin and Pioglitazone in Diabetic Patients With NAFLD	2023	NA	Ongoing trial without reported data
The Impact Of SGLT2 -I on Metabolic Dysfunction - Associated Steatotic Liver Disease In Patients With Type 2 Diabetes Mellitus	2023	NA	Ongoing trial without reported data
Efficacy of SGLT2 inhibitor for Non-Alcoholic Fatty Liver Disease	2020	NA	Ongoing trial without reported data
Effect of Vitamin E and Alpha Lipoic Acid in Nonalcoholic Fatty Liver Disease: A Randomized, Placebo-Controlled, Open-Label, Prospective Clinical Trial (VAIN Trial)	2014	https://doi.org/10.4236/ojgas.2014.45030	Data not extractable for meta-analysis
Efficacy of rosiglitazone in treatment of nonalcoholic fatty liver disease and its relations with adiponectin	2006	https://doi.org/10.11569/wcjd.v14.i13.1326	Data not extractable for meta-analysis
Comparing the effect of Empagliflozin with Pioglitazone on nonalcoholic fatty liver	2022	NA	Data not extractable for meta-analysis
Dapagliflozin vs vitamin E against NAFLD with type 2 DM	2019	NA	Data not extractable for meta-analysis

Effectiveness of dapagliflozin in nonalcoholic fatty liver disease in type 2 diabetes patients compared to sitagliptin and pioglitazone	2017	https://doi.org/10.1007/s00125-017-4350-z	Data not extractable for meta-analysis
The effect of the combination of dapagliflozin and liraglutide in non alcoholic fatty liver disease in patients with type 2 diabetes compared to sitagliptin and pioglitazone	2018	https://doi.org/10.1007/s00125-018-4693-0	Data not extractable for meta-analysis
The effect of lixisenatide and dapagliflozin in nonalcoholic fatty liver disease in patients with type 2 diabetes mellitus compared with sitagliptin and pioglitazone	2018	https://doi.org/10.2337/db18-1235-P	Data not extractable for meta-analysis
Effect of Vitamin E on Non-Alcoholic Fatty Liver Disease	2014	NA	Data not extractable for meta-analysis
Vitamin E Versus Placebo for the Treatment of Non Diabetic Patients With Nonalcoholic Steatohepatitis	2016	NA	Data not extractable for meta-analysis
Comparison of The Effects of Thiazolidinediones(TZD), Sodium- Glucose Cotransporter 2 Inhibitors(SGLT2i) Alone and TZD / SGLT2i Combination Therapy on Non-alcoholic Fatty Liver Disease in Type 2 Diabetic Patients With Fatty Liver	2018	NA	Data not extractable for meta-analysis
Effect of Oral Anti-diabetic Medication on Liver Fat in Subjects With Type II Diabetes and Non-alcoholic Fatty Liver	2021	NA	Data not extractable for meta-analysis
Comparison of Dapagliflozin and Pioglitazone Effects on Nonalcoholic Fatty Liver Disease and Nonalcoholic Steatohepatitis in Patients With Type 2 Diabetes: a Randomized,Open-Label, Active-Controlled Trial	2017	NA	Data not extractable for meta-analysis
Haptoglobin Genotype and Vitamin E Versus Placebo for the Treatment of Nondiabetic Patients with Nonalcoholic Steatohepatitis in China: A Multicenter, Randomized, Placebo-Controlled Trial Design	2018	https://doi.org/10.1007/s12325-018-0670-8	Data not extractable for meta-analysis

Table S5 Sensitivity analysis

Network estimate	BMI		WC		FPG		HbA1c		ALT		AST		TC		TG		LDL-C	
Comparison	Initial	Sensitivity	Initial	Sensitivity	Initial	Sensitivity	Initial	Sensitivity	Initial	Sensitivity	Initial	Sensitivity	Initial	Sensitivity	Initial	Sensitivity	Initial	Sensitivity
GLP-1RA VS. Placebo	-1.95 (-2.81, -1.21)	-1.66 (-2.59, -0.73)	-4.97 (-7.80, -2.14)	-3.49 (-9.27, 2.29)⁺	-1.21 (-1.93, -0.56)	-1.68 (-2.64, -0.71)	-0.68 (-1.03, -0.36)	-0.66 (-1.05, -0.28)	-17.01 (-26.23, -8.03)	-20.17 (-32.11, -8.24)	-10.24 (-17.06, -3.36)	-13.50 (-23.34, -3.66)	-0.30 (-0.70, 0.11)	-0.31 (-1.21, 0.59)	-0.38 (-0.81, 0.05)	-0.39 (-0.77, -0.02)⁺	0.03 (-0.30, 0.36)	-0.25 (-0.75, 0.25)
GLP-1RA VS. SGLT-2 inhibitors	-0.72 (-1.70, 0.18)	-0.71 (-2.01, 0.60)	-2.97 (-6.89, 0.93)	-0.99 (-7.03, 4.26)	-0.67 (-1.47, 0.07)	-1.32 (-2.61, 0.01)	-0.15 (-0.54, 0.26)	-0.14 (-0.79, 0.50)	-4.02 (-14.35, 6.27)	-8.64 (-28.29, 11.06)	-0.67 (-8.35, 7.12)	-4.88 (-20.14, 10.81)	-0.32 (-0.86, 0.22)	-0.34 (-1.12, 0.45)	-0.32 (-0.90, 0.24)	-0.60 (-1.25, 0.15)	-0.04 (-0.45, 0.36)	-0.34 (-0.98, 0.30)
GLP-1RA VS. Thiazolidinediones	-2.58 (-3.68, -1.61)	-2.23 (-3.75, -0.61)	-7.92 (-11.67, -3.44)	-2.79 (-11.86, 5.50)⁺	-0.58 (-1.33, 0.14)	-0.93 (-2.19, 0.40)	-0.14 (-0.53, 0.23)	-0.18 (-0.79, 0.41)	-2.68 (-12.11, 7.26)	-2.36 (-21.49, 17.67)	-2.13 (-9.11, 5.19)	-4.47 (-19.46, 10.90)	-0.45 (-0.91, 0.03)	-0.49 (-1.15, 0.18)	-0.24 (-0.74, 0.27)	-0.15 (-0.74, 0.43)	-0.16 (-0.54, 0.21)	-0.44 (-1.01, 0.14)
GLP-1RA VS. Vitamin E	-2.72 (-3.79, -1.60)	-2.17 (-3.74, -0.67)	-5.96 (-11.45, -0.44)	-3.40 (-11.00, 3.75)⁺	-0.79 (-1.63, -0.02)	-1.17 (-2.47, 0.16)⁺	-0.07 (-0.99, 0.83)	-0.06 (-1.17, 0.94)	-5.98 (-18.09, 6.24)	-7.41 (-27.51, 13.78)	-2.33 (-11.33, 6.73)	-4.01 (-19.95, 12.01)	-0.41 (-0.96, 0.11)	-0.39 (-1.11, 0.28)	-0.24 (-0.82, 0.37)	-0.24 (-0.82, 0.38)	-0.05 (-0.49, 0.35)	-0.33 (-0.94, 0.23)
SGLT-2 inhibitors VS. Placebo	-1.20 (-1.83, -0.71)	-0.95 (-1.28, -0.62)	-2.03 (-3.32, -0.74)	-2.03 (-3.32, -0.74)	-0.54 (-0.96, -0.17)	-0.37 (-0.79, 0.05)⁺	-0.54 (-0.80, -0.31)	-0.62 (-0.88, -0.35)	-12.96 (-19.24, -6.86)	-9.35 (-18.37, -0.33)	-9.53 (-14.20, -5.06)	-8.33 (-15.64, -0.93)	0.03 (-0.37, 0.40)	0.05 (-0.27, 0.37)	-0.06 (-0.46, 0.34)	0.26 (-0.03, 0.55)	0.07 (-0.19, 0.33)	0.04 (-0.24, 0.31)
Thiazolidinediones VS. Placebo	0.64 (-0.07, 1.38)	0.53 (-0.44, 1.49)	2.93 (-1.72, 6.99)	0.00 (-6.46, 6.46)	-0.63 (-1.03, -0.29)	-0.80 (-1.22, -0.38)	-0.54 (-0.77, -0.33)	-0.44 (-0.65, -0.23)	-14.34 (-20.93, -8.61)	-17.70 (-27.77, -7.62)	-8.11 (-12.65, -3.80)	-8.07 (-12.63, -3.50)	0.15 (-0.16, 0.43)	0.21 (-0.08, 0.50)	-0.14 (-0.48, 0.17)	-0.23 (-0.55, 0.08)	0.19 (-0.03, 0.41)	0.19 (-0.07, 0.45)
Vitamin E VS. Placebo	0.75 (-0.13, 1.48)	0.49 (-0.36, 1.35)	0.35 (-4.15, 4.86)	0.35 (-4.15, 4.86)	-0.41 (-0.88, 0.02)	-0.49 (-1.05, 0.05)	-0.60 (-1.36, 0.16)	-0.60 (-1.36, 0.16)	-11.10 (-19.78, -2.69)	-10.91 (-17.48, -4.34)	-7.90 (-14.23, -1.62)	-8.51 (-11.85, -5.18)	0.11 (-0.19, 0.41)	0.11 (-0.19, 0.41)	-0.11 (-0.29, 0.07)	-0.11 (-0.29, 0.07)	0.09 (-0.20, 0.38)	0.09 (-0.20, 0.38)
SGLT-2 inhibitors VS. Thiazolidinediones	-1.85 (-2.77, -1.04)	-1.50 (-2.67, -0.42)	-4.86 (-9.68, 0.50)	-1.80 (-9.55, 6.02)	0.09 (-0.31, 0.51)	0.38 (-0.32, 1.14)	0.01 (-0.22, 0.19)	-0.07 (-0.51, 0.42)	1.38 (-4.61, 8.10)	6.23 (-5.28, 18.93)	-1.43 (-6.04, 3.33)	0.28 (-9.01, 9.98)	-0.13 (-0.47, 0.23)	-0.15 (-0.73, 0.43)	0.08 (-0.24, 0.45)	0.44 (-0.16, 0.96)	-0.12 (-0.33, 0.09)	-0.10 (-0.53, 0.34)
SGLT-2 inhibitors VS. Vitamin E	-1.96 (-2.89, -1.00)	-1.48 (-2.64, -0.31)	-3.04 (-8.64, 2.79)	-2.33 (-8.45, 3.77)	-0.12 (-0.69, 0.43)	0.15 (-0.65, 0.91)	0.07 (-0.81, 0.95)	0.07 (-0.95, 1.04)	-1.85 (-11.86, 8.22)	1.11 (-12.58, 16.38)	-1.60 (-8.99, 5.62)	0.77 (-10.50, 12.30)	-0.08 (-0.63, 0.40)	-0.06 (-0.73, 0.57)	0.08 (-0.46, 0.65)	0.35 (-0.26, 0.92)	0.00 (-0.39, 0.34)	0.01 (-0.51, 0.49)
Thiazolidinediones VS. Vitamin E	-0.11 (-0.77, 0.72)	0.05 (-1.33, 1.40)	1.74 (-4.02, 7.56)	-0.90 (-7.67, 5.87)	-0.22 (-0.72, 0.25)	-0.24 (-0.95, 0.39)	0.07 (-0.82, 0.95)	0.14 (-0.88, 1.06)	-3.24 (-12.92, 5.89)	-5.15 (-18.28, 8.20)	-0.17 (-6.92, 6.45)	0.47 (-9.81, 10.75)	0.04 (-0.44, 0.45)	0.10 (-0.42, 0.56)	0.00 (-0.50, 0.48)	-0.09 (-0.49, 0.35)	0.12 (-0.24, 0.43)	0.11 (-0.32, 0.48)
Sensitivity analysis after excluding studies with the high risk for bias. Because of there are no studies with the high risk of bias or the small number of remaining studies, no sensitivity analysis for other outcomes. *The results show some instability, but the overall results are still relatively robust. BMI, body mass index; WC, waist circumference; FPG, fasting plasma glucose; HbA1c, glycated hemoglobin; ALT, alanine aminotransferase; AST, aspartate aminotransferase; TC, total cholesterol; TG, triglyceride; LDL-C, low-density lipoprotein cholesterol.																		

Table S6 Inconsistency assessment

The P-value of node-splitting analysis of inconsistency	BMI	WC	FPG	HOMA-IR	HbA1c	ALT	AST	TC	TG	LDL-C	Steatosis	Fibrosis	NAS	Resolution of NASH	Hepatic fat content (H-MRS)	Hepatic fat content(PDFF)
Comparison																
GLP-1RA VS. Placebo	0.14	0.28	0.37	0.85	0.59	0.1	0.46	0.1	0.97	0.63	...	...	...	...	0.95	...
GLP-1RA VS. SGLT-2 inhibitors	0.15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
GLP-1RA VS. Thiazolidinediones	...	0.3	0.37	0.85	0.55	0.11	0.46	0.09	0.99	0.63	...	...	...	...	0.93	...
GLP-1RA VS. Vitamin E	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
SGLT-2 inhibitors VS. Placebo	0.88	...	0.37	0.54	0.26	0.62	0.86	0.9	0.23	0.9	...	...	...	...	...	...
SGLT-2 inhibitors VS. Thiazolidinediones	0.96	...	0.65	0.42	0.03*	0.34	0.59	0.97	0.2	0.68	...	...	...	...	...	...
SGLT-2 inhibitors VS. Vitamin E	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thiazolidinediones VS. Placebo	0.86	0.26	0.38	0.65	0.38	0.25	0.81	0.39	0.29	0.9	...	...	...	...	0.94	...
Thiazolidinediones VS. Vitamin E	0.69	0.5	0.56	0.98	...	0.78	0.69	0.91	0.82	0.84	...	...	...	0.77	...	...
Vitamin E VS. Placebo	0.51	...	0.66	1	...	0.72	0.5	...	...	...	...	...	...	...	...	...

BMI, body mass index; WC, waist circumference; HbA1c, glycated hemoglobin; TC, total cholesterol; TG, triglyceride; LDL-C, low-density lipoprotein cholesterol; ALT, alanine aminotransferase; AST, aspartate aminotransferase; FPG, fasting plasma glucose; HOMA-IR, homeostasis model assessment of insulin resistance; H-MRS, proton magnetic resonance spectroscopy; PDFF, proton density fat fraction; NAS, nonalcoholic fatty liver disease activity score.

*Data showed inconsistency between direct and indirect estimates (p-value <0.05). Missing data indicates that there are no available direct or indirect estimates.

Table S7 Certainty of evidence

Outcome: BMI						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-1.78 (-2.43, -1.14)	moderate [*]	-3.66 (-5.99, -1.34)	low ^a	-1.95 (-2.81, -1.21)	moderate
GLP-1RA VS. SGLT-2 inhibitors	...	...	-0.72 (-1.70, 0.18)	moderate ^b	-0.72 (-1.70, 0.18)	moderate
GLP-1RA VS. Thiazolidinediones	-4.10 (-6.27, -1.93)	low ^{*,†}	-2.23 (-3.36, -1.13)	moderate ^c	-2.58 (-3.68, -1.61)	moderate
GLP-1RA VS. Vitamin E	...	...	-2.72 (-3.79, -1.60)	moderate ^b	-2.72 (-3.79, -1.60)	moderate
SGLT-2 inhibitors VS. Placebo	-1.29 (-1.90, -0.68)	moderate [*]	-1.40 (-3.79, 0.87)	moderate ^c	-1.20 (-1.83, -0.71)	moderate
Thiazolidinediones VS. Placebo	0.53 (-0.44, 1.49)	high	0.72 (-0.34, 1.80)	moderate ^b	0.64 (-0.07, 1.38)	high
Vitamin E VS. Placebo	0.49 (-0.36, 1.35)	moderate [‡]	1.00 (-0.32, 2.31)	low ^a	0.75 (-0.13, 1.48)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	-1.87 (-3.42, -0.32)	moderate [*]	-1.85 (-2.97, -0.76)	moderate ^c	-1.85 (-2.77, -1.04)	moderate
SGLT-2 inhibitors VS. Vitamin E	...	...	-1.96 (-2.89, -1.00)	moderate ^b	-1.96 (-2.89, -1.00)	moderate
Thiazolidinediones VS. Vitamin E	-0.23 (-0.63, 0.17)	low ^{**,‡}	0.15 (-1.28, 1.63)	moderate ^c	-0.11 (-0.77, 0.72)	moderate

Outcome: WC						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-4.35 (-7.23, -1.48)	moderate [*]	-9.17 (-18.03, -0.46)	low ^d	-4.97 (-7.80, -2.14)	moderate
GLP-1RA VS. SGLT-2 inhibitors	...	...	-2.97 (-6.89, 0.93)	moderate ^c	-2.97 (-6.89, 0.93)	moderate
GLP-1RA VS. Thiazolidinediones	-9.10 (-12.26, -5.94)	low ^{*,†}	-4.31 (-11.71, 3.75)	moderate ^b	-7.92 (-11.67, -3.44)	moderate
GLP-1RA VS. Vitamin E	...	...	-5.96 (-11.45, -0.44)	moderate ^c	-5.96 (-11.45, -0.44)	moderate
SGLT-2 inhibitors VS. Placebo	-2.03 (-3.32, -0.74)	high	...	...	-2.03 (-3.32, -0.74)	high
Thiazolidinediones VS. Placebo	0.00 (-6.46, 6.46)	moderate [‡]	4.60 (-1.17, 10.67)	low ^a	2.93 (-1.72, 6.99)	moderate
Vitamin E VS. Placebo	0.35 (-4.15, 4.86)	high	...	...	0.35 (-4.15, 4.86)	high
SGLT-2 inhibitors VS. Thiazolidinediones	...	...	-4.86 (-9.68, 0.50)	very low ^{c,†}	-4.86 (-9.68, 0.50)	very low
SGLT-2 inhibitors VS. Vitamin E	...	...	-3.04 (-8.64, 2.79)	low ^{c,†}	-3.04 (-8.64, 2.79)	low
Thiazolidinediones VS. Vitamin E	-0.90 (-7.67, 5.87)	low ^{‡,§}	3.84 (-5.35, 11.94)	moderate ^c	1.74 (-4.02, 7.56)	moderate

Outcome: FPG						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-1.10 (-1.82, -0.38)	moderate [*]	-1.95 (-3.76, -0.22)	low ^a	-1.21 (-1.93, -0.56)	moderate
GLP-1RA VS. SGLT-2 inhibitors	...	...	-0.67 (-1.47, 0.07)	low ^d	-0.67 (-1.47, 0.07)	low
GLP-1RA VS. Thiazolidinediones	-1.30 (-2.85, 0.25)	low ^{*,†}	-0.43 (-1.25, 0.40)	moderate ^c	-0.58 (-1.33, 0.14)	moderate
GLP-1RA VS. Vitamin E	...	...	-0.79 (-1.63, -0.02)	low ^d	-0.79 (-1.63, -0.02)	low
SGLT-2 inhibitors VS. Placebo	-0.44 (-0.86, -0.02)	low ^{*,†}	-0.76 (-1.47, -0.11)	very low ^f	-0.54 (-0.96, -0.17)	low
Thiazolidinediones VS. Placebo	-0.80 (-1.22, -0.38)	high	-0.47 (-1.05, 0.08)	low ^d	-0.63 (-1.03, -0.29)	high
Vitamin E VS. Placebo	-0.28 (-0.47, -0.09)	low ^{‡,§}	-0.18 (-1.23, 0.78)	very low ^f	-0.41 (-0.88, 0.02)	low
SGLT-2 inhibitors VS. Thiazolidinediones	0.00 (-0.35, 0.36)	very low ^{*,I,§}	0.21 (-0.47, 0.83)	low ^a	0.09 (-0.31, 0.51)	low
SGLT-2 inhibitors VS. Vitamin E	...	...	-0.12 (-0.69, 0.43)	low ^g	-0.12 (-0.69, 0.43)	low
Thiazolidinediones VS. Vitamin E	-0.03 (-0.84, 0.78)	very low ^{*,I}	-0.32 (-1.07, 0.39)	low ^a	-0.22 (-0.72, 0.25)	low

Outcome: HOMA-IR						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-1.60 (-2.22, -0.98)	low ^{*,†}	-1.86 (-4.19, 0.54)	low ^g	-1.66 (-2.85, -0.49)	low

GLP-1RA VS. SGLT-2 inhibitors	...	...	-1.17 (-2.53, 0.19)	low ^g	-1.17 (-2.53, 0.19)	low
GLP-1RA VS. Thiazolidinediones	-1.00 (-2.70, 0.70)	low ^{*,†}	-0.74 (-2.51, 1.02)	low ^g	-0.83 (-2.12, 0.43)	low
GLP-1RA VS. Vitamin E	...	...	-1.66 (-3.17, -0.20)	low ^d	-1.66 (-3.17, -0.20)	low
SGLT-2 inhibitors VS. Placebo	-0.77 (-1.48, -0.05)	low ^{*,§}	-0.24 (-1.61, 1.19)	very low ^f	-0.50 (-1.34, 0.33)	low
Thiazolidinediones VS. Placebo	-0.49 (-1.75, 0.77)	low ^{‡,§}	-0.95 (-2.06, 0.13)	very low ^{d,§}	-0.84 (-1.62, -0.04)	low
Vitamin E VS. Placebo	-0.01 (-0.15, 0.13)	moderate [†]	-0.00 (-1.89, 1.94)	low ^g	-0.01 (-1.00, 1.03)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	0.53 (-0.31, 1.37)	very low ^{*,†}	-0.16 (-1.69, 1.30)	low ^g	0.34 (-0.44, 1.05)	low
SGLT-2 inhibitors VS. Vitamin E	...	...	-0.49 (-1.68, 0.63)	low ^d	-0.49 (-1.68, 0.63)	low
Thiazolidinediones VS. Vitamin E	-0.82 (-1.35, -0.29)	low ^{*,†}	-0.84 (-2.62, 1.00)	low ^d	-0.84 (-1.84, 0.20)	low

Outcome: HbA1c	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
Comparison						
GLP-1RA VS. Placebo	-0.63 (-0.91, -0.36)	moderate [*]	-0.94 (-1.98, 0.04)	low ^a	-0.68 (-1.03, -0.36)	moderate
GLP-1RA VS. SGLT-2 inhibitors	...	...	-0.15 (-0.54, 0.26)	moderate ^b	-0.15 (-0.54, 0.26)	moderate
GLP-1RA VS. Thiazolidinediones	-0.40 (-1.30, 0.50)	low ^{*,†}	-0.09 (-0.52, 0.33)	moderate ^c	-0.14 (-0.53, 0.23)	moderate
GLP-1RA VS. Vitamin E	...	...	-0.07 (-0.99, 0.83)	low ^{b,§}	-0.07 (-0.99, 0.83)	low
SGLT-2 inhibitors VS. Placebo	-0.70 (-0.99, -0.41)	moderate [*]	-0.41 (-0.79, -0.06)	very low ^f	-0.54 (-0.80, -0.31)	moderate
Thiazolidinediones VS. Placebo	-0.44 (-0.65, -0.23)	high	-0.66 (-1.05, -0.28)	low ^d	-0.54 (-0.77, -0.33)	high
Vitamin E VS. Placebo	-0.60 (-1.36, 0.16)	moderate [†]	...	...	-0.60 (-1.36, 0.16)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	0.10 (-0.09, 0.28)	very low ^{*,†,‡}	-0.36 (-0.74, 0.01)	moderate ^c	0.01 (-0.22, 0.19)	moderate
SGLT-2 inhibitors VS. Vitamin E	...	...	0.07 (-0.81, 0.95)	moderate ^b	0.07 (-0.81, 0.95)	moderate
Thiazolidinediones VS. Vitamin E	...	...	0.07 (-0.82, 0.95)	moderate ^c	0.07 (-0.82, 0.95)	moderate

Outcome: ALT	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
Comparison						
GLP-1RA VS. Placebo	-12.75 (-24.06, -1.43)	very low ^{*,†,§}	-25.64 (-40.93, -11.58)	low ^d	-17.01 (-26.23, -8.03)	low
GLP-1RA VS. SGLT-2 inhibitors	...	...	-4.02 (-14.35, 6.27)	very low ^h	-4.02 (-14.35, 6.27)	very low
GLP-1RA VS. Thiazolidinediones	-10.00 (-10.73, -9.27)	low ^{*,†}	4.00 (-8.00, 15.40)	very low ⁱ	-2.68 (-12.11, 7.26)	low
GLP-1RA VS. Vitamin E	...	...	-5.98 (-18.09, 6.24)	low ^d	-5.98 (-18.09, 6.24)	low
SGLT-2 inhibitors VS. Placebo	-11.07 (-18.39, -3.75)	very low ^{*,†}	-14.87 (-27.30, -3.41)	very low ⁱ	-12.96 (-19.24, -6.86)	very low
Thiazolidinediones VS. Placebo	-17.70 (-27.77, -7.62)	moderate [†]	-10.57 (-19.63, -1.98)	very low ^h	-14.34 (-20.93, -8.61)	moderate
Vitamin E VS. Placebo	-10.91 (-17.48, -4.34)	moderate [†]	-7.51 (-28.71, 13.16)	moderate ^b	-11.10 (-19.78, -2.69)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	2.10 (0.19, 4.02)	very low ^{*,‡}	6.16 (-4.27, 18.21)	very low ⁱ	1.38 (-4.61, 8.10)	very low
SGLT-2 inhibitors VS. Vitamin E	...	...	-1.85 (-11.86, 8.22)	very low ⁱ	-1.85 (-11.86, 8.22)	very low
Thiazolidinediones VS. Vitamin E	-3.67 (-12.95, 5.61)	moderate [*]	-1.67 (-15.36, 11.63)	moderate ^b	-3.24 (-12.92, 5.89)	moderate

Outcome: AST	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
Comparison						
GLP-1RA VS. Placebo	-8.58 (-17.59, 0.43)	very low ^{*,†,§}	-13.59 (-25.78, -1.60)	low ^a	-10.24 (-17.06, -3.36)	low
GLP-1RA VS. SGLT-2 inhibitors	...	...	-0.67 (-8.35, 7.12)	very low ^h	-0.67 (-8.35, 7.12)	very low
GLP-1RA VS. Thiazolidinediones	-4.90 (-5.61, -4.19)	low ^{*,†}	0.37 (-9.48, 10.05)	very low ^f	-2.13 (-9.11, 5.19)	low
GLP-1RA VS. Vitamin E	...	...	-2.33 (-11.33, 6.73)	low ^g	-2.33 (-11.33, 6.73)	low

SGLT-2 inhibitors VS. Placebo	-9.02 (-17.47, -0.56)	very low ^{*,I,§}	-9.95 (-18.65, -1.42)	very low ^f	-9.53 (-14.20, -5.06)	very low
Thiazolidinediones VS. Placebo	-8.07 (-12.63, -3.50)	high	-7.47 (-14.27, -0.80)	low ^d	-8.11 (-12.65, -3.80)	high
Vitamin E VS. Placebo	-8.51 (-11.85, -5.18)	moderate [‡]	-3.44 (-18.00, 10.97)	low ^a	-7.90 (-14.23, -1.62)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	-1.35 (-2.27, -0.42)	very low ^{*,‡}	0.50 (-7.38, 8.63)	very low ^f	-1.43 (-6.04, 3.33)	very low
SGLT-2 inhibitors VS. Vitamin E	...	...	-1.60 (-8.99, 5.62)	very low ⁱ	-1.60 (-8.99, 5.62)	very low
Thiazolidinediones VS. Vitamin E	-0.91 (-6.87, 5.05)	low ^{*,§}	1.41 (-8.59, 11.35)	moderate ^c	-0.17 (-6.92, 6.45)	moderate

Outcome: TC	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
Comparison						

GLP-1RA VS. Placebo	-0.47 (-1.10, 0.17)	very low ^{*,I}	0.41 (-0.53, 1.32)	low ^d	-0.30 (-0.70, 0.11)	low
GLP-1RA VS. SGLT-2 inhibitors	...	...	-0.32 (-0.86, 0.22)	very low ^f	-0.32 (-0.86, 0.22)	very low
GLP-1RA VS. Thiazolidinediones	0.20 (-0.51, 0.91)	low ^{*,‡}	-0.67 (-1.16, -0.14)	very low ⁱ	-0.45 (-0.91, 0.03)	low
GLP-1RA VS. Vitamin E	...	...	-0.41 (-0.96, 0.11)	low ^d	-0.41 (-0.96, 0.11)	low
SGLT-2 inhibitors VS. Placebo	0.05 (-0.27, 0.37)	high	-0.01 (-0.62, 0.55)	very low ⁱ	0.03 (-0.37, 0.40)	high
Thiazolidinediones VS. Placebo	0.21 (-0.08, 0.50)	moderate [‡]	-0.05 (-0.69, 0.50)	moderate ^b	0.15 (-0.16, 0.43)	moderate
Vitamin E VS. Placebo	0.11 (-0.19, 0.41)	moderate [‡]	...	...	0.11 (-0.19, 0.41)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	-0.18 (-0.23, -0.12)	very low ^{*,‡,§}	-0.12 (-0.76, 0.56)	moderate ^c	-0.13 (-0.47, 0.23)	moderate
SGLT-2 inhibitors VS. Vitamin E	...	...	-0.08 (-0.63, 0.40)	moderate ^c	-0.08 (-0.63, 0.40)	moderate
Thiazolidinediones VS. Vitamin E	-0.02 (-0.83, 0.79)	moderate [‡]	0.04 (-0.50, 0.52)	moderate ^b	0.04 (-0.44, 0.45)	moderate

Outcome: TG	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
Comparison						

GLP-1RA VS. Placebo	-0.40 (-0.65, -0.14)	low ^{*,§}	-0.37 (-1.49, 0.72)	low ^d	-0.38 (-0.81, 0.05)	low
GLP-1RA VS. SGLT-2 inhibitors	...	...	-0.32 (-0.90, 0.24)	low ^d	-0.32 (-0.90, 0.24)	low
GLP-1RA VS. Thiazolidinediones	-0.23 (-1.04, 0.58)	low ^{*,‡}	-0.24 (-0.81, 0.35)	low ^d	-0.24 (-0.74, 0.27)	low
GLP-1RA VS. Vitamin E	...	...	-0.24 (-0.82, 0.37)	low ^d	-0.24 (-0.82, 0.37)	low
SGLT-2 inhibitors VS. Placebo	0.26 (-0.03, 0.55)	moderate [§]	-0.27 (-0.75, 0.28)	very low ⁱ	-0.06 (-0.46, 0.34)	moderate
Thiazolidinediones VS. Placebo	-0.23 (-0.55, 0.08)	moderate [‡]	0.13 (-0.51, 0.68)	moderate ^b	-0.14 (-0.48, 0.17)	moderate
Vitamin E VS. Placebo	-0.11 (-0.29, 0.07)	moderate [‡]	...	...	-0.11 (-0.29, 0.07)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	-0.02 (-0.36, 0.32)	very low ^{*,I,‡,§}	0.45 (-0.22, 1.11)	moderate ^b	0.08 (-0.24, 0.45)	moderate
SGLT-2 inhibitors VS. Vitamin E	...	...	0.08 (-0.46, 0.65)	moderate ^b	0.08 (-0.46, 0.65)	moderate
Thiazolidinediones VS. Vitamin E	0.00 (-0.48, 0.48)	moderate [‡]	0.07 (-0.57, 0.69)	moderate ^b	0.00 (-0.50, 0.48)	moderate

Outcome: LDL-C	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
Comparison						

GLP-1RA VS. Placebo	-0.02 (-0.54, 0.49)	low ^{*,‡}	0.20 (-0.60, 1.01)	low ^d	0.03 (-0.30, 0.36)	low
GLP-1RA VS. SGLT-2 inhibitors	...	...	-0.04 (-0.45, 0.36)	low ^a	-0.04 (-0.45, 0.36)	low
GLP-1RA VS. Thiazolidinediones	0.00 (-0.65, 0.65)	low ^{*,‡}	-0.21 (-0.63, 0.22)	low ^d	-0.16 (-0.54, 0.21)	low
GLP-1RA VS. Vitamin E	...	...	-0.05 (-0.49, 0.35)	low ^d	-0.05 (-0.49, 0.35)	low
SGLT-2 inhibitors VS. Placebo	0.04 (-0.24, 0.31)	high	0.04 (-0.34, 0.40)	very low ⁱ	0.07 (-0.19, 0.33)	high
Thiazolidinediones VS. Placebo	0.19 (-0.07, 0.45)	moderate [‡]	0.17 (-0.25, 0.56)	moderate ^b	0.19 (-0.03, 0.41)	moderate
Vitamin E VS. Placebo	0.09 (-0.20, 0.38)	moderate [‡]	...	...	0.09 (-0.20, 0.38)	moderate

SGLT-2 inhibitors VS. Thiazolidinediones	-0.12 (-0.26, 0.02)	very low ^{*,I,‡}	-0.21 (-0.68, 0.25)	moderate ^c	-0.12 (-0.33, 0.09)	moderate
SGLT-2 inhibitors VS. Vitamin E	...	...	0.00 (-0.39, 0.34)	moderate ^c	0.00 (-0.39, 0.34)	moderate
Thiazolidinediones VS. Vitamin E	-0.03 (-0.71, 0.65)	moderate [‡]	0.12 (-0.28, 0.46)	moderate ^b	0.12 (-0.24, 0.43)	moderate

Outcome: Steatosis						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-0.30 (-0.77, 0.17)	moderate [‡]	...	...	-0.30 (-0.77, 0.17)	moderate
GLP-1RA VS. Thiazolidinediones	...	...	0.50 (-0.74, 1.72)	moderate ^b	0.50 (-0.74, 1.72)	moderate
GLP-1RA VS. Vitamin E	...	...	0.30 (-1.22, 1.86)	moderate ^b	0.30 (-1.22, 1.86)	moderate
Thiazolidinediones VS. Placebo	-0.80 (-1.12, -0.47)	moderate [‡]	...	...	-0.80 (-1.12, -0.47)	moderate
Vitamin E VS. Placebo	-0.60 (-1.05, -0.15)	moderate [‡]	...	...	-0.60 (-1.05, -0.15)	moderate
Thiazolidinediones VS. Vitamin E	...	...	-0.19 (-1.40, 1.02)	moderate ^b	-0.19 (-1.40, 1.02)	moderate

Outcome: Fibrosis						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-0.40 (-0.93, 0.13)	moderate [‡]	...	...	-0.40 (-0.93, 0.13)	moderate
GLP-1RA VS. Thiazolidinediones	...	...	-0.07 (-0.89, 0.73)	moderate ^b	-0.07 (-0.89, 0.73)	moderate
GLP-1RA VS. Vitamin E	...	...	-0.10 (-1.16, 0.94)	moderate ^b	-0.10 (-1.16, 0.94)	moderate
Thiazolidinediones VS. Placebo	-0.32 (-0.59, -0.05)	moderate [‡]	...	...	-0.32 (-0.59, -0.05)	moderate
Vitamin E VS. Placebo	-0.30 (-0.80, 0.20)	moderate [‡]	...	...	-0.30 (-0.80, 0.20)	moderate
Thiazolidinediones VS. Vitamin E	...	...	-0.04 (-0.83, 0.77)	moderate ^b	-0.04 (-0.83, 0.77)	moderate

Outcome: NAS						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-0.50 (-1.32, 0.32)	moderate [‡]	...	...	-0.50 (-1.32, 0.32)	moderate
GLP-1RA VS. Thiazolidinediones	...	...	1.06 (-1.80, 3.58)	low ^d	1.06 (-1.80, 3.58)	low
Thiazolidinediones VS. Placebo	-1.66 (-2.32, -0.99)	low ^{‡,§}	...	...	-1.66 (-2.32, -0.99)	low

Outcome: Resolution of NASH						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	2.59 (1.73, 3.87)	moderate [‡]	...	...	2.59 (1.73, 3.87)	moderate
GLP-1RA VS. Thiazolidinediones	...	...	1.11 (0.36, 3.47)	moderate ^c	1.11 (0.36, 3.47)	moderate
GLP-1RA VS. Vitamin E	...	...	1.67 (0.48, 5.65)	moderate ^b	1.67 (0.48, 5.65)	moderate
Thiazolidinediones VS. Placebo	2.51 (1.62, 3.89)	high	...	...	2.51 (1.62, 3.89)	high
Vitamin E VS. Placebo	1.91 (1.11, 3.29)	moderate [‡]	...	...	1.91 (1.11, 3.29)	moderate
Thiazolidinediones VS. Vitamin E	1.39 (0.81, 2.39)	moderate [‡]	1.43 (0.62, 3.26)	moderate ^c	1.48 (0.52, 4.12)	moderate

Outcome: Hepatic fat content(H-MRS)						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-6.20 (-7.63, -4.77)	low ^{*,†}	-6.50 (-17.95, 4.94)	low ^d	-6.26 (-11.49, -1.17)	low
GLP-1RA VS. Thiazolidinediones	-2.50 (-4.30, -0.70)	low ^{*,†}	-2.13 (-13.45, 9.09)	low ^d	-2.43 (-7.55, 2.69)	low
Thiazolidinediones VS. Placebo	-4.00 (-6.37, -1.63)	moderate [‡]	-3.70 (-14.75, 7.71)	low ^d	-3.84 (-9.04, 1.22)	low

Outcome: Hepatic fat content(PDFF)						
Comparison	Direct estimate	Quality of the evidence	Indirect estimate	Quality of the evidence	Network	Quality of the evidence
GLP-1RA VS. Placebo	-2.93 (-5.35, -0.51)	moderate [‡]	...	...	-2.93 (-5.35, -0.51)	moderate

GLP-1RA VS. SGLT-2 inhibitors	...	...	1.17 (-10.14, 12.59)	very low ⁱ	1.17 (-10.14, 12.59)	very low
GLP-1RA VS. Thiazolidinediones	...	...	1.35 (-12.01, 14.55)	moderate ^b	1.35 (-12.01, 14.55)	moderate
SGLT-2 inhibitors VS. Placebo	-4.15 (-9.16, 0.86)	very low ^{*,I,§}	...	...	-4.15 (-9.16, 0.86)	very low
Thiazolidinediones VS. Placebo	-4.30 (-7.75, -0.85)	moderate [‡]	...	...	-4.30 (-7.75, -0.85)	moderate
SGLT-2 inhibitors VS. Thiazolidinediones	...	...	0.18 (-11.53, 11.55)	very low ⁱ	0.18 (-11.53, 11.55)	very low

* Risk of bias; † Inconsistency; ‡ Indirectness; § Imprecision; I Severe inconsistency; † Severe imprecision; a, Direct evidence of high or low quality; b, Direct evidence of moderate quality; c, Direct evidence of high or moderate quality; d, Direct evidence of moderate or low quality; e, Direct evidence of high quality; f, Direct evidence of high or very low quality; g, Direct evidence of low quality; h, Direct evidence of low or very low quality; i, Direct evidence of moderate or very low quality.

Table S8 The conclusions from the minimally contextualized framework

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 1: among the most effective	GLP-1RA	-1.95 (-2.81, -1.21)	98.75%	Moderate
	SGLT-2I	-1.20 (-1.83, -0.71)	76.25%	Moderate
Category 0: among the least effective	Thiazolidinediones	0.64 (-0.07, 1.38)	16.75%	High
	Vitamin E	0.75 (-0.13, 1.48)	10.25%	Moderate

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 1: among the most effective	GLP-1RA	-4.97 (-7.80, -2.14)	98.25%	Moderate
	SGLT-2I	-2.03 (-3.32, -0.74)	70.75%	High
Category 0: among the least effective	Vitamin E	0.35 (-4.15, 4.86)	30.25%	High
	Thiazolidinediones	2.93 (-1.72, 6.99)	9.25%	Moderate

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 1: among the most effective	Thiazolidinediones	-14.34 (-20.93, -8.61)	68.50%	Moderate
	Vitamin E	-11.10 (-19.78, -2.69)	43.00%	Moderate
Low certainty (low to very low certainty evidence)				
Category 1: might be among the most effective	GLP-1RA	-17.01 (-26.23, -8.03)	84.00%	Low
	SGLT-2I	-12.96 (-19.24, -6.86)	54.75%	Very low

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 1: among the most effective	Thiazolidinediones	-8.11 (-12.65, -3.80)	51.25%	High
	Vitamin E	-7.90 (-14.23, -1.62)	52.25%	Moderate
Low certainty (low to very low certainty evidence)				
Category 1: might be among the most effective	GLP-1RA	-10.24 (-17.06, -3.36)	75.25%	Low
	SGLT-2I	-9.53 (-14.20, -5.06)	71.25%	Very low

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 2: among the most effective	GLP-1RA	-1.21 (-1.93, -0.56)	97.25%	Moderate
Category 1: among effective	Thiazolidinediones	-0.63 (-1.03, -0.29)	64.00%	High
Low certainty (low to very low certainty evidence)				
Category 1: might be among effective	SGLT-2I	-0.54 (-0.96, -0.17)	50.75%	Low
Category 0: might be among the least effective	Vitamin E	-0.41 (-0.88, 0.02)	37.00%	Low

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 1: among the most effective	GLP-1RA	-0.68 (-1.03, -0.36)	77.75%	Moderate
	Thiazolidinediones	-0.54 (-0.77, -0.33)	54.75%	High
	SGLT-2I	-0.54 (-0.80, -0.31)	53.50%	Moderate
Category 0: among the least effective	Vitamin E	-0.60 (-1.36, 0.16)	62.25%	Moderate

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 0: among the least effective	Vitamin E	-0.01 (-1.00, 1.03)	17.75%	Moderate
Low certainty (low to very low certainty evidence)				
Category 1: might be among the most effective	GLP-1RA	-1.66 (-2.85, -0.49)	96.25%	Low
	Thiazolidinediones	-0.84 (-1.62, -0.04)	72.00%	Low
Category 0: might be among the least effective	SGLT-2I	-0.50 (-1.34, 0.33)	48.50%	Low

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 0: among the least effective	SGLT-2I	0.03 (-0.37, 0.40)	49.25%	High
	Vitamin E	0.11 (-0.19, 0.41)	31.00%	Moderate
	Thiazolidinediones	0.15 (-0.16, 0.43)	21.00%	Moderate
Low certainty (low to very low certainty evidence)				
Category 1: might be among the most effective	GLP-1RA	-0.30 (-0.70, 0.11)	93.00%	Low

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 0: among the least effective	Thiazolidinediones	-0.14 (-0.48, 0.17)	54.25%	Moderate
	Vitamin E	-0.15 (-0.57, 0.26)	52.50%	Moderate
	SGLT-2I	-0.06 (-0.46, 0.34)	36.00%	Moderate
Low certainty (low to very low certainty evidence)				
Category 1: might be among the most effective	GLP-1RA	-0.38 (-0.81, 0.05)	87.50%	Low

Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 0: among the least effective	SGLT-2I	0.07 (-0.19, 0.33)	52.25%	High
	Vitamin E	0.09 (-0.20, 0.38)	48.00%	Moderate

	Thiazolidinediones	0.19 (-0.03, 0.41)	15.00%	Moderate
Low certainty (low to very low certainty evidence)				
Category 0: might be among the least effective	GLP-1RA	0.03 (-0.30, 0.36)	60.25%	Low
Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 2: among the most effective	Thiazolidinediones	-0.80 (-1.12, -0.47)	84.00%	Moderate
	Vitamin E	-0.60 (-1.05, -0.15)	64.67%	Moderate
Category 1: among effective	GLP-1RA	-0.30 (-0.77, 0.17)	40.00%	Moderate
Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 2: among the most effective	Thiazolidinediones	-0.32 (-0.59, -0.05)	64.33%	Moderate
Category 1: among effective	GLP-1RA	-0.40 (-0.93, 0.13)	67.67%	Moderate
	Vitamin E	-0.30 (-0.80, 0.20)	56.33%	Moderate
Classification of intervention	Intervention	Intervention versus placebo (RR (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 2: among the most effective	GLP-1RA	2.59 (1.73, 3.87)	79.33%	Moderate
	Thiazolidinediones	2.50 (1.61, 3.85)	74.00%	High
Category 1: among effective	Vitamin E	1.92 (1.11, 3.33)	46.33%	Moderate
Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				
Category 0: among the least effective	GLP-1RA	-0.50 (-1.32, 0.32)	45.50%	Moderate
Low certainty (low to very low certainty evidence)				
Category 1: might be among the most effective	Thiazolidinediones	-1.66 (-2.32, -0.99)	90.00%	Low
Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
Low certainty (low to very low certainty evidence)				
Category 1: might be among the most effective	GLP-1RA	-6.26 (-11.49, -1.17)	94.00%	Low
Category 0: might be among the least effective	Thiazolidinediones	-3.84 (-9.04, 1.22)	53.00%	Low
Classification of intervention	Intervention	Intervention versus placebo (MD (95% CI))	Surface under the cumulative ranking curve (SUCRA)	Certainty of the evidence
High certainty (moderate to high certainty evidence)				

Category 1: among the most effective	Thiazolidinediones	-4.30 (-7.75, -0.85)	65.33%	Moderate
	GLP-1RA	-2.93 (-5.35, -0.51)	52.33%	Moderate
Low certainty (low to very low certainty evidence)				
Category 0: might be among the least effective	SGLT-2I	-4.15 (-9.16, 0.86)	67.00%	Very low

GRADE Working Groups Certainty of Evidence Definitions.

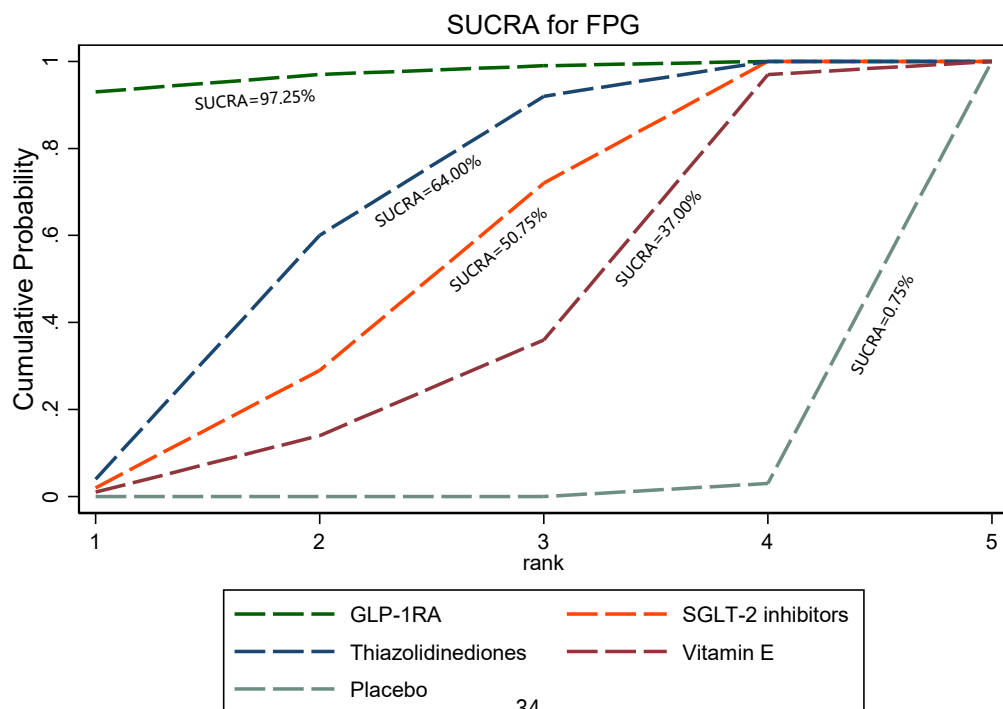
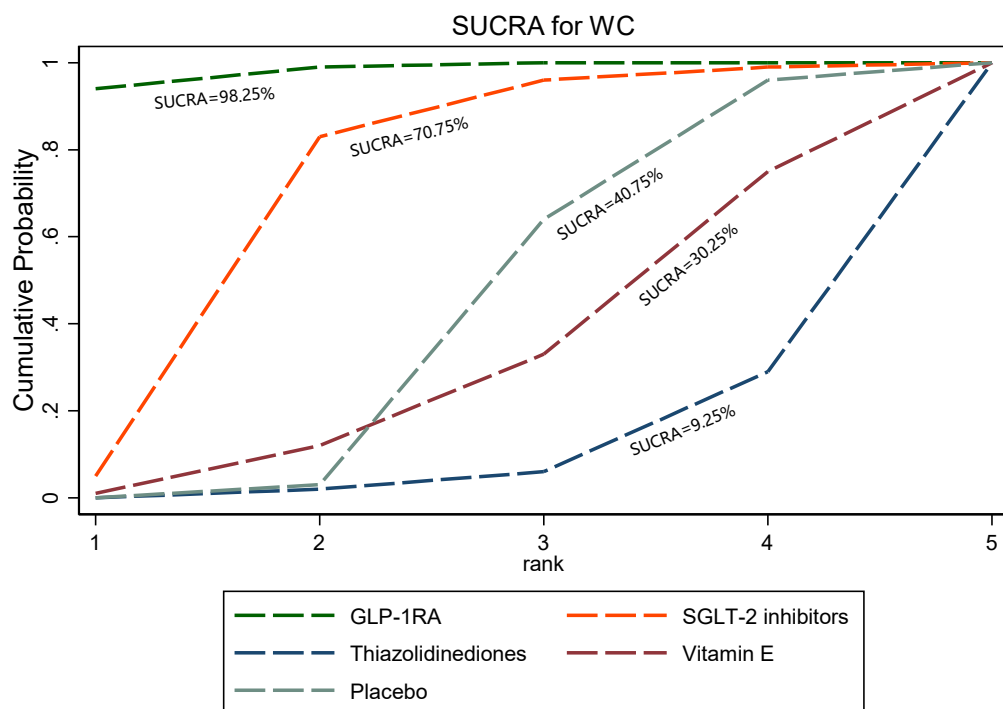
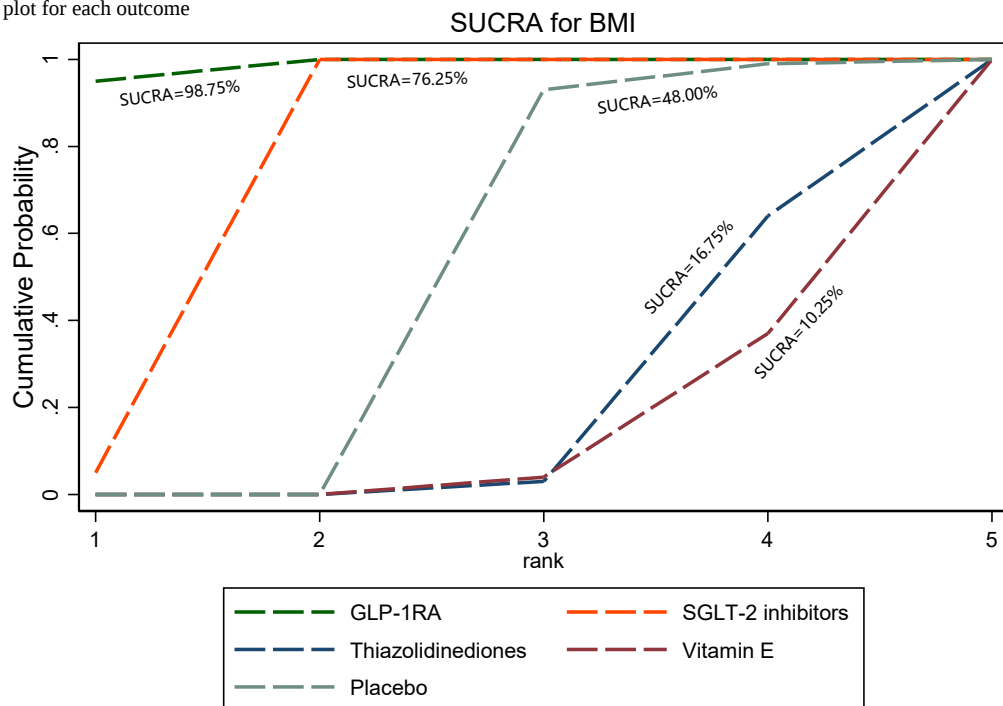
High certainty: We are very confident that the true effect lies close to that of the estimate of effect.

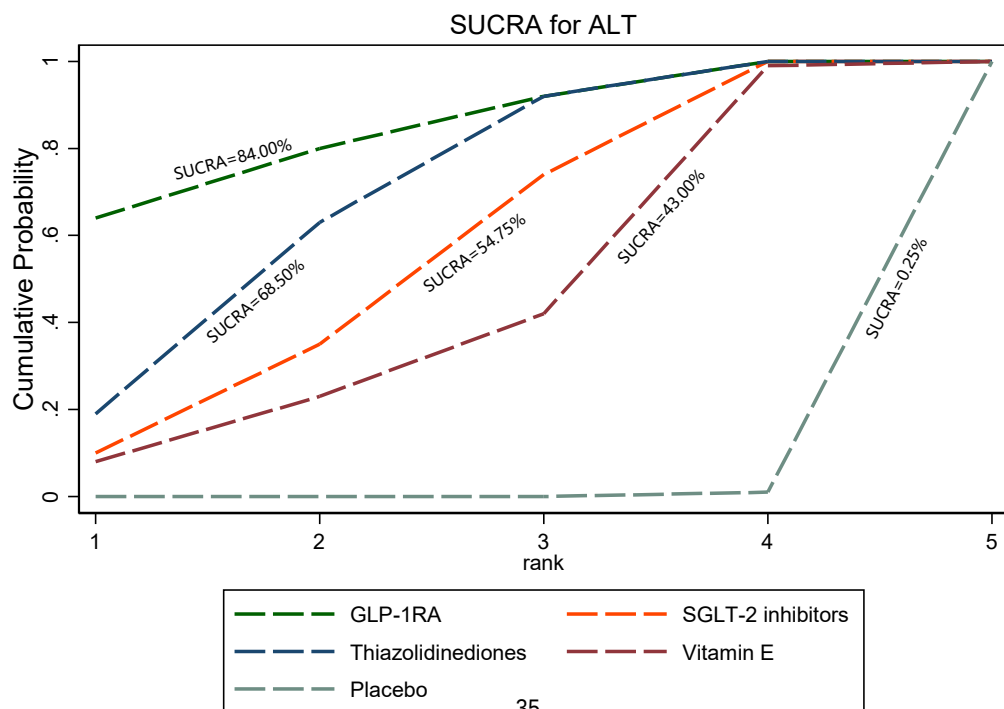
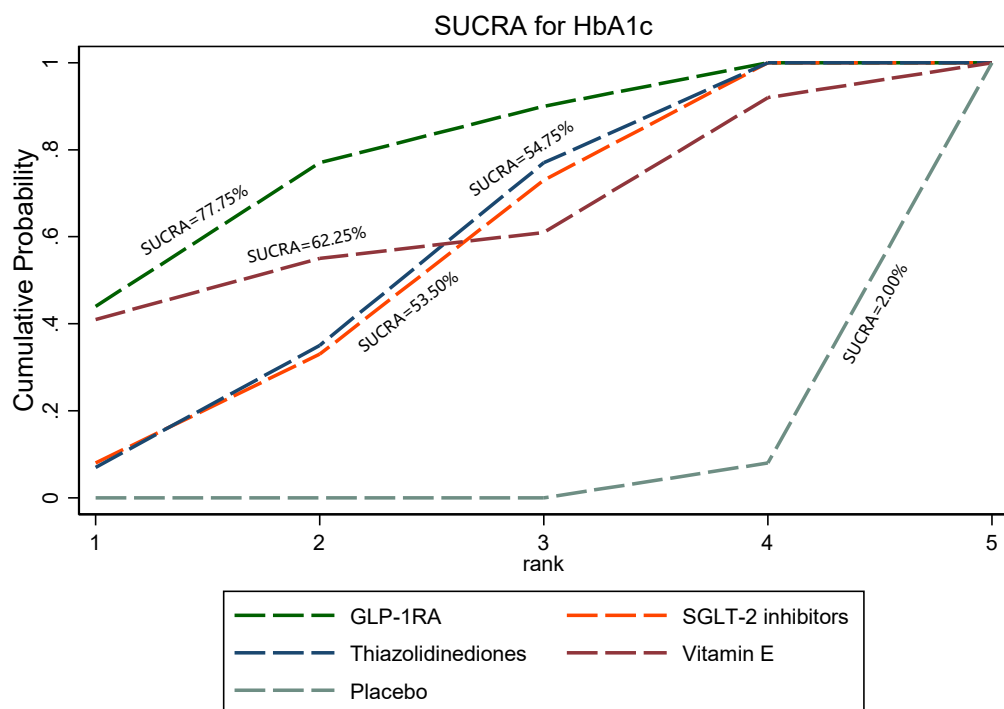
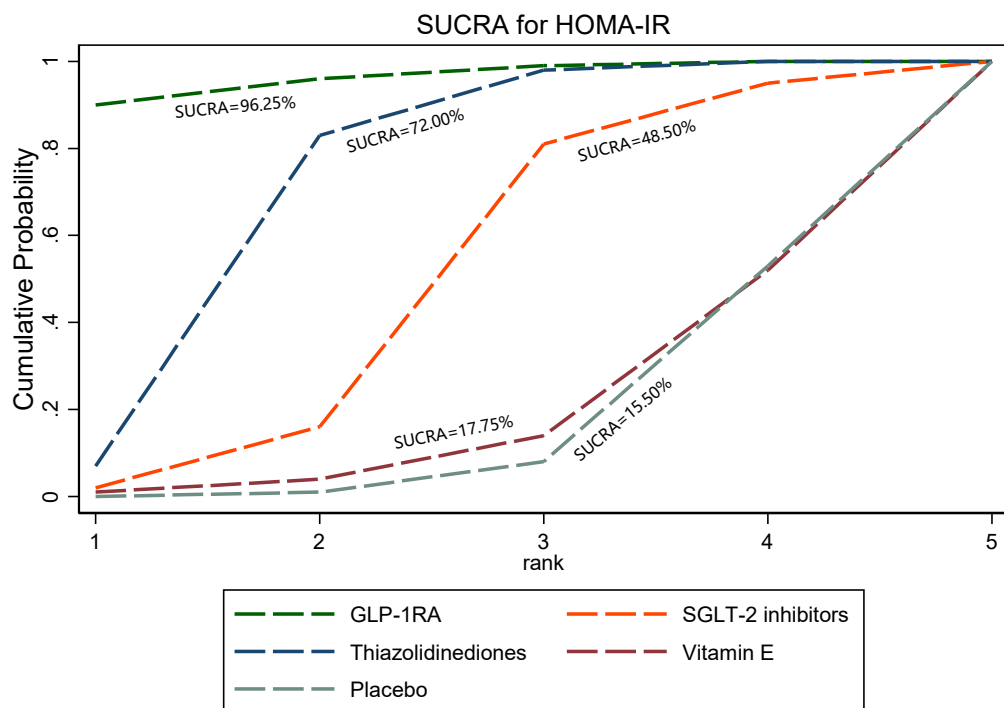
Moderate certainty: We are moderately confident in the effect estimate. The true effect is likely to be close to the estimate of effect, but there is a possibility that it is substantially different.

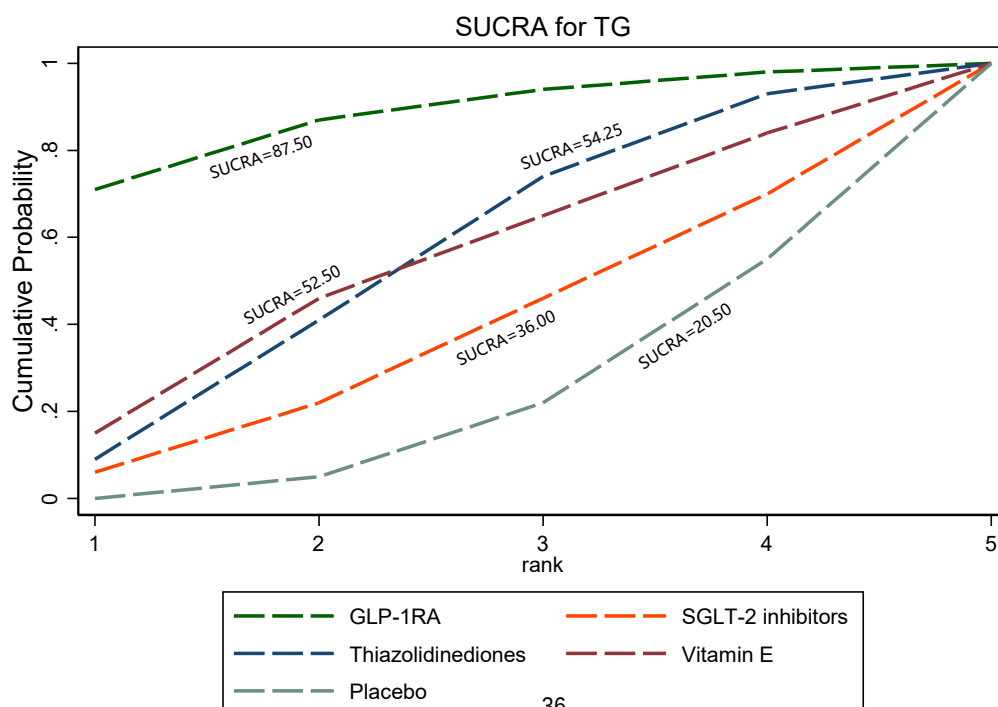
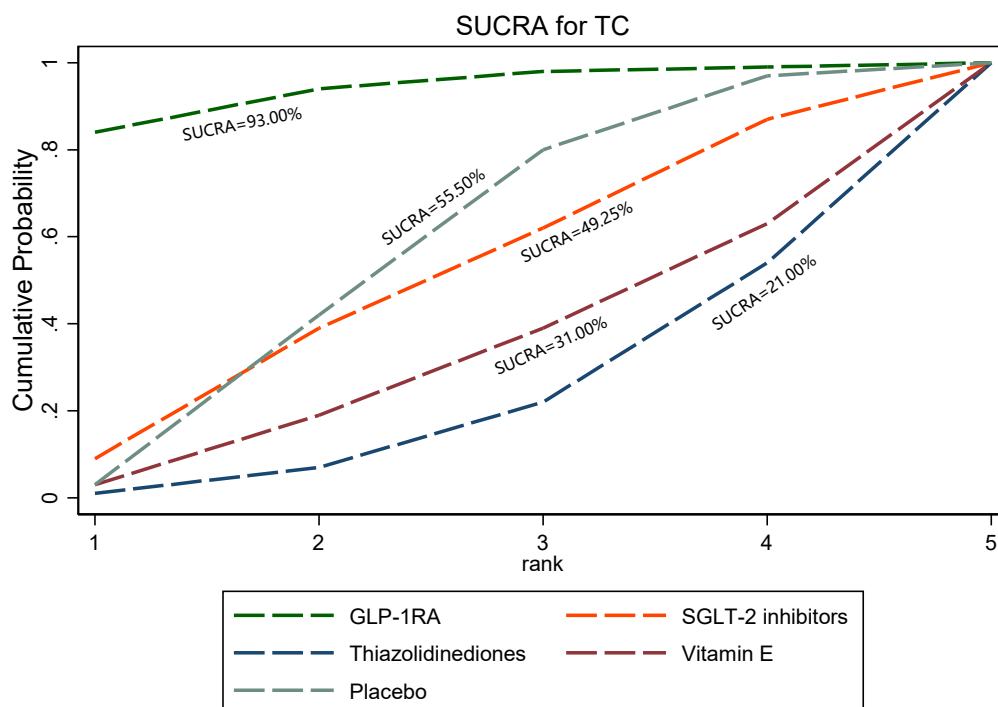
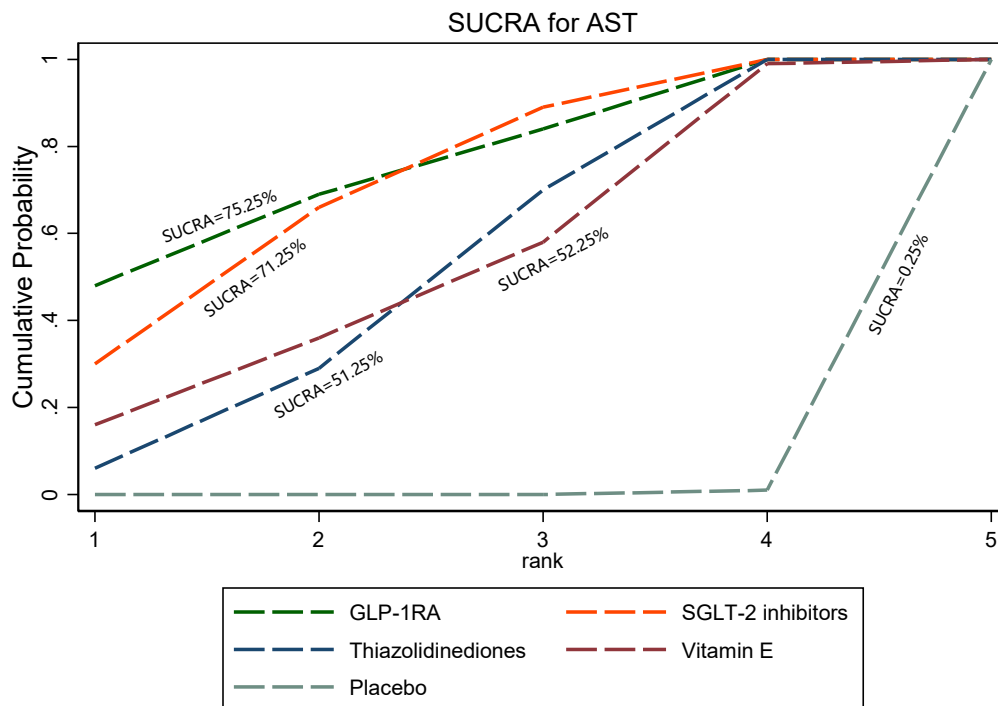
Low certainty: Our confidence in the effect estimate is limited. The true effect may be substantially different from the estimate of the effect.

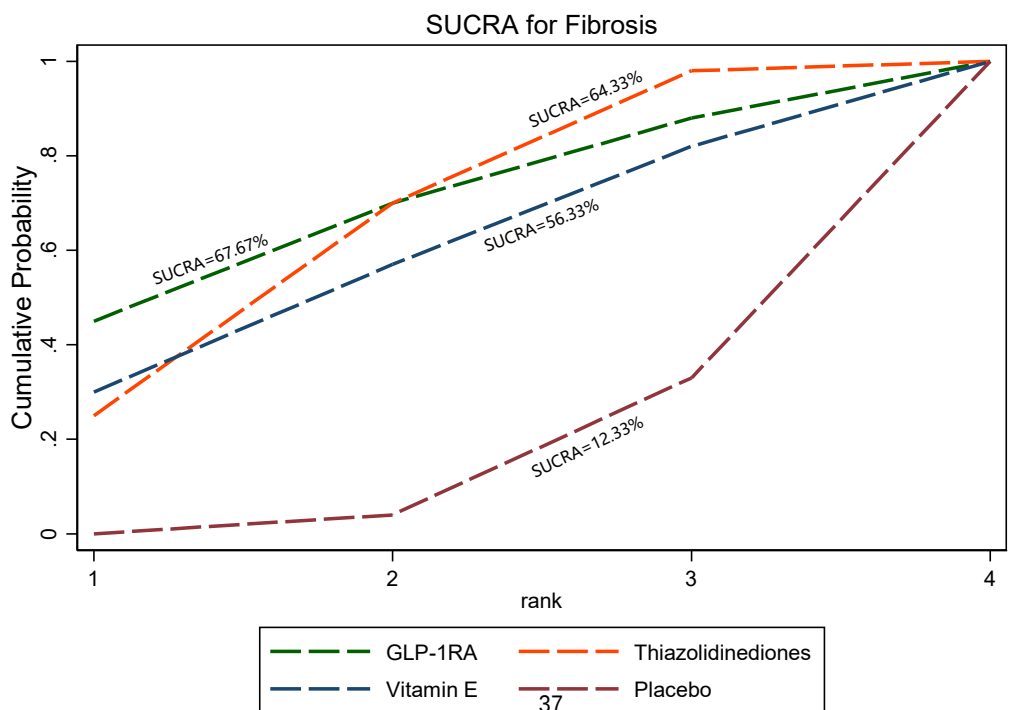
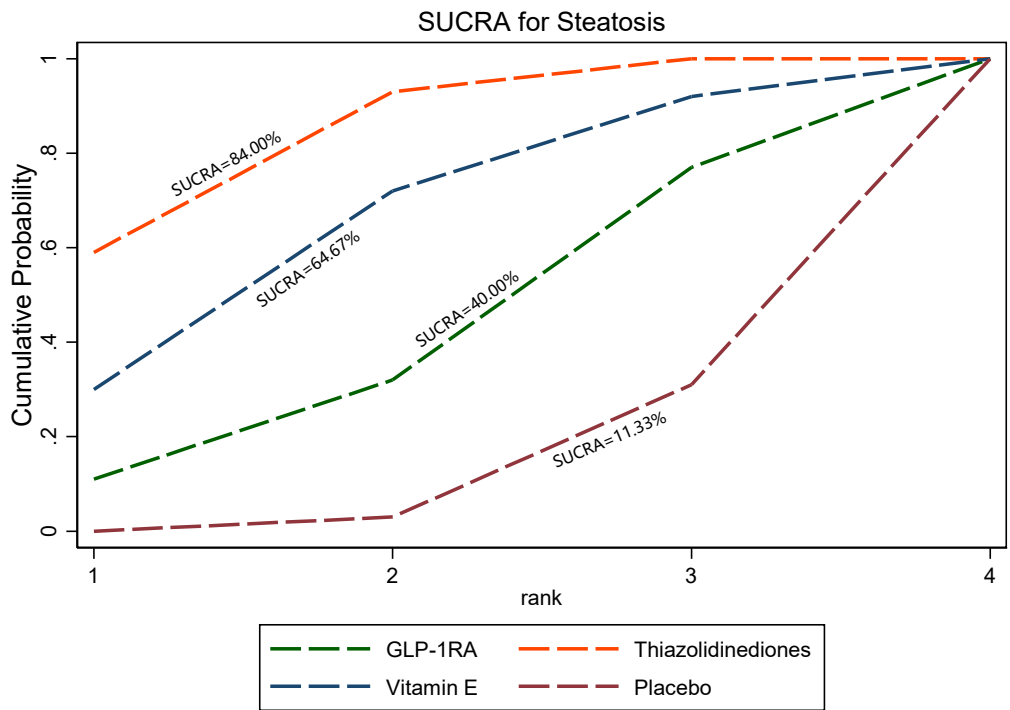
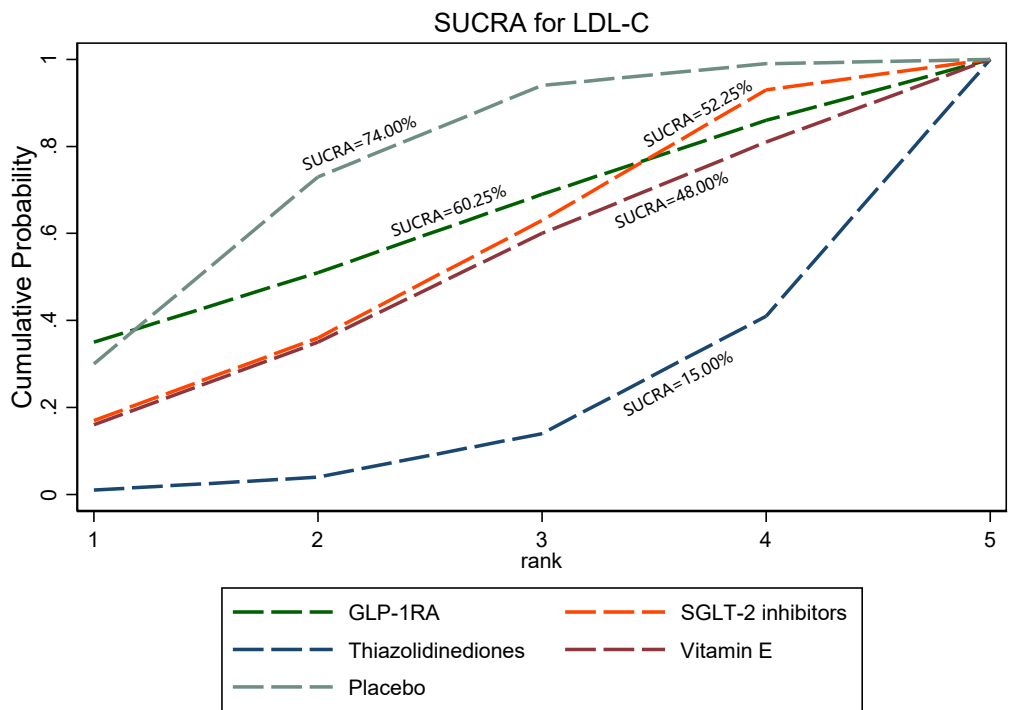
Very low certainty: We have very little confidence in the effect estimate. The true effect is likely to be substantially different from the estimate of effect.

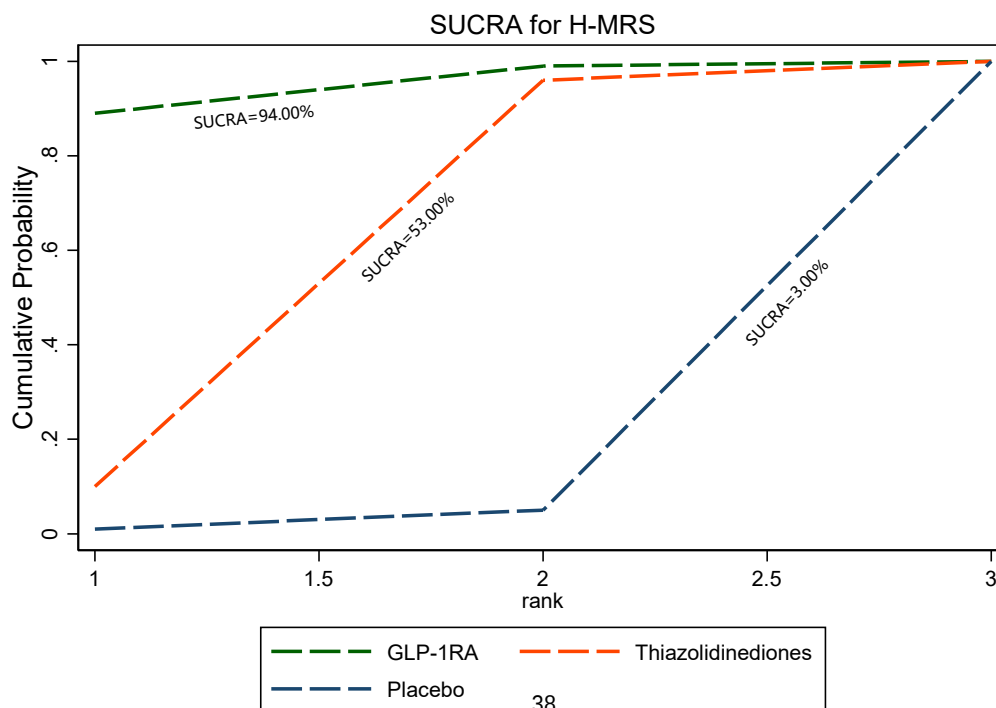
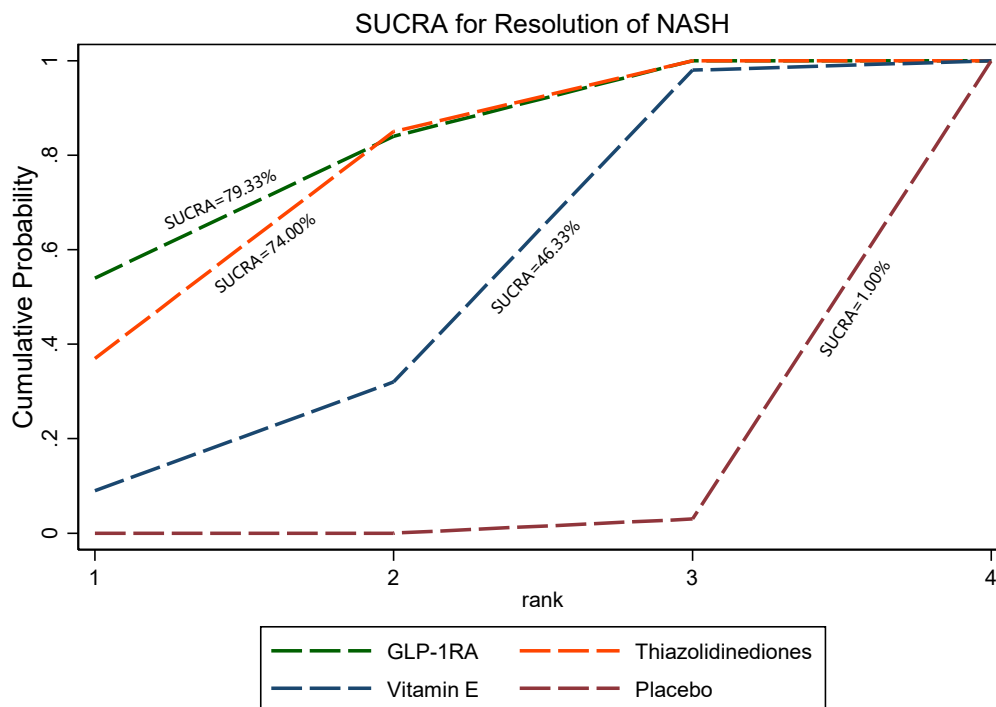
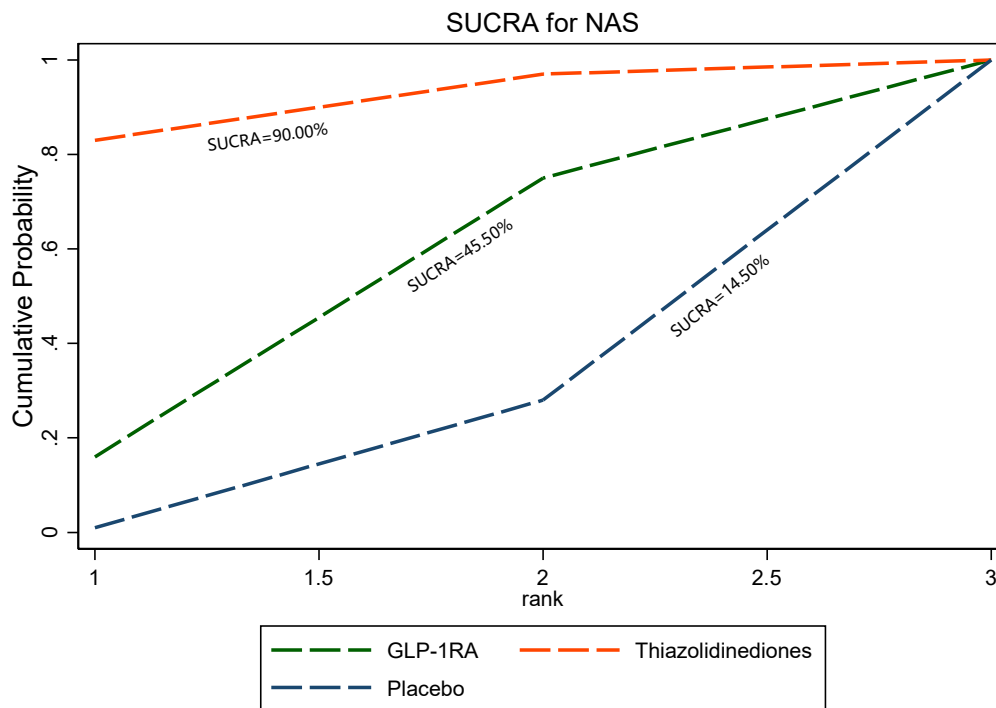
Figure S1 SUCRA ranking plot for each outcome











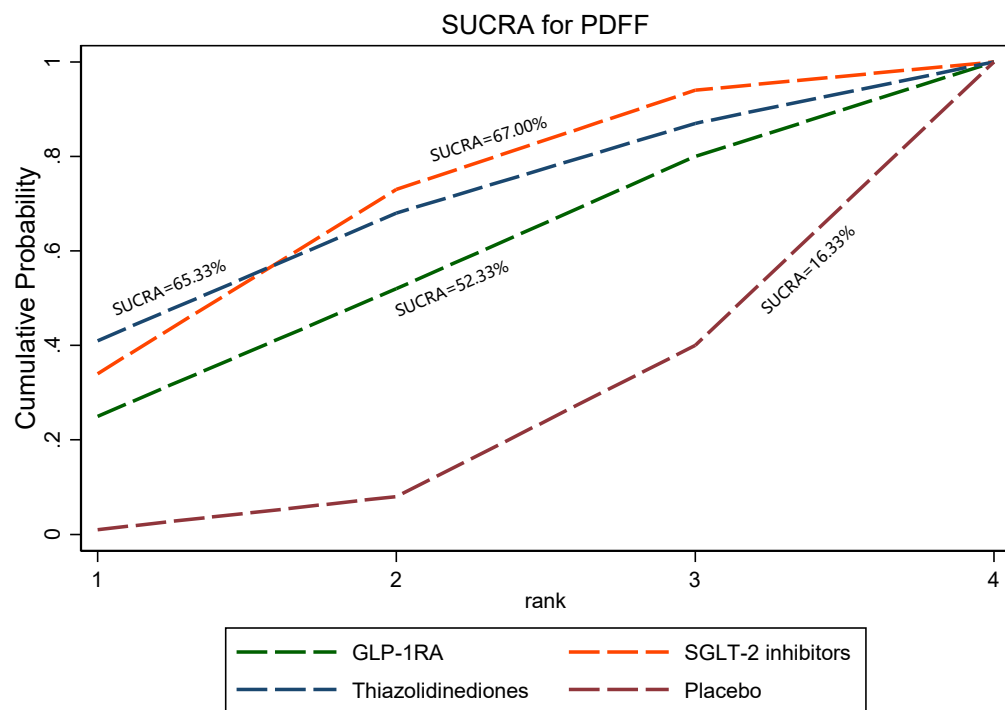
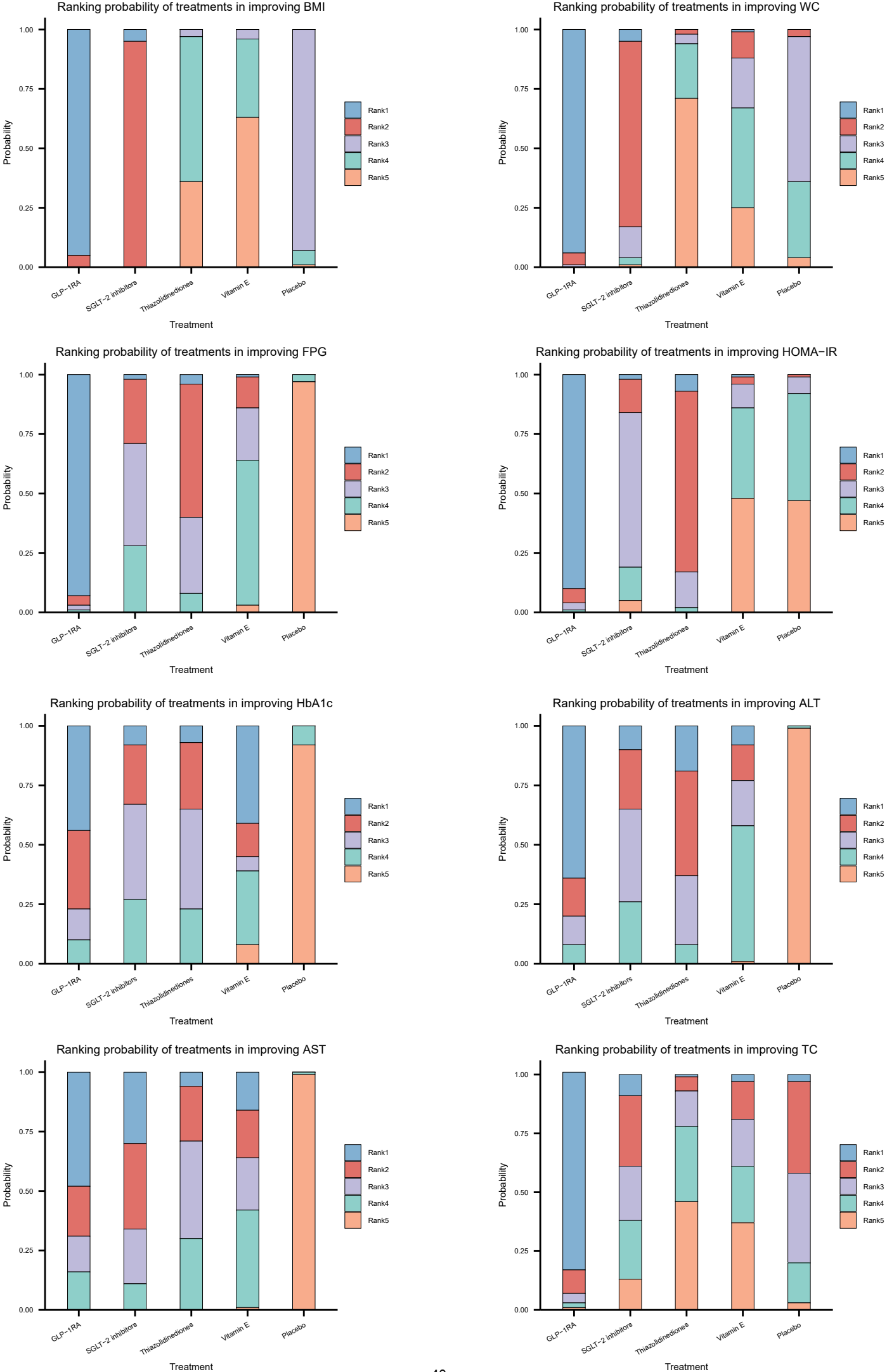
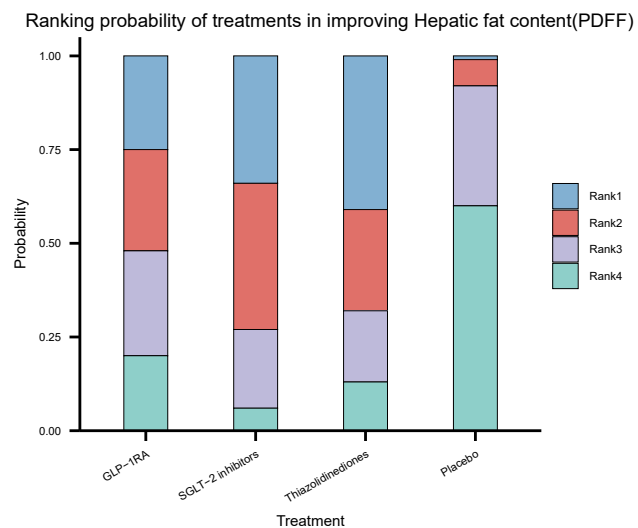
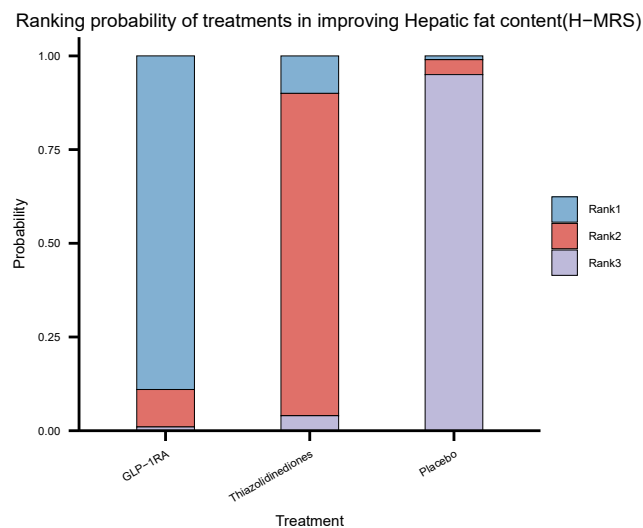
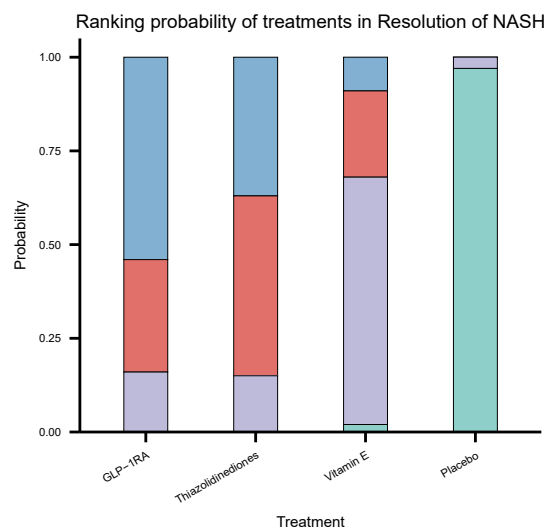
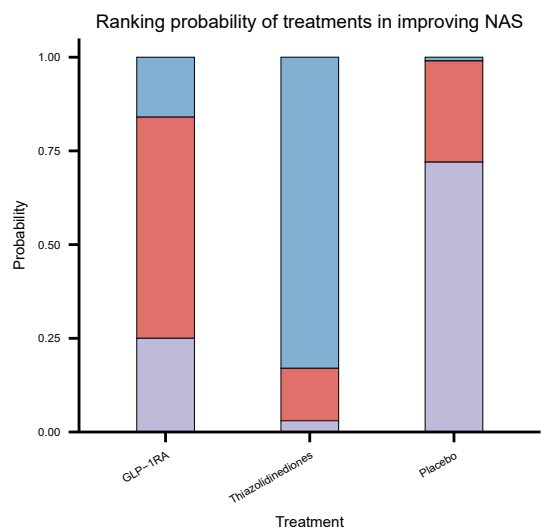
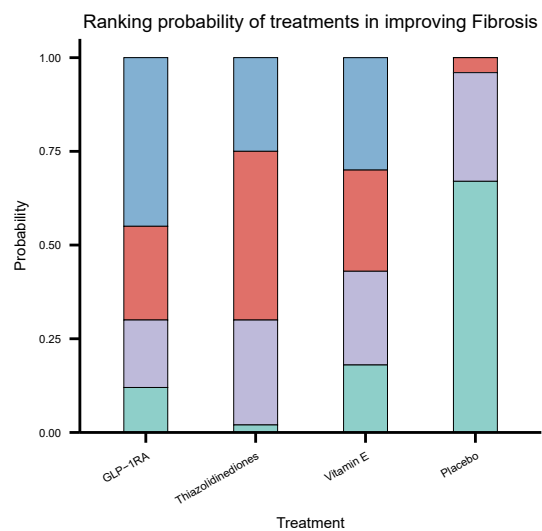
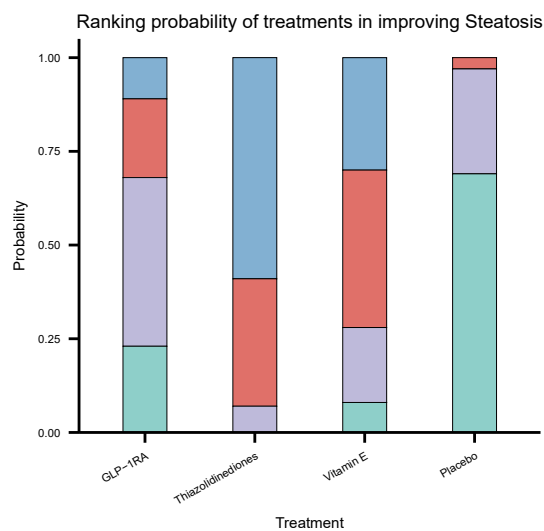
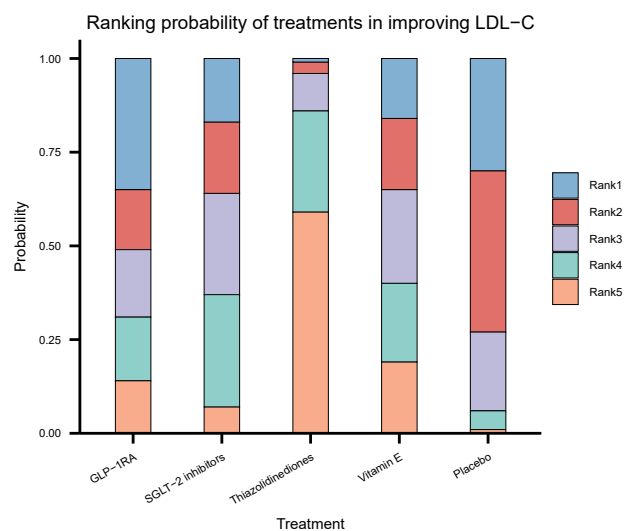
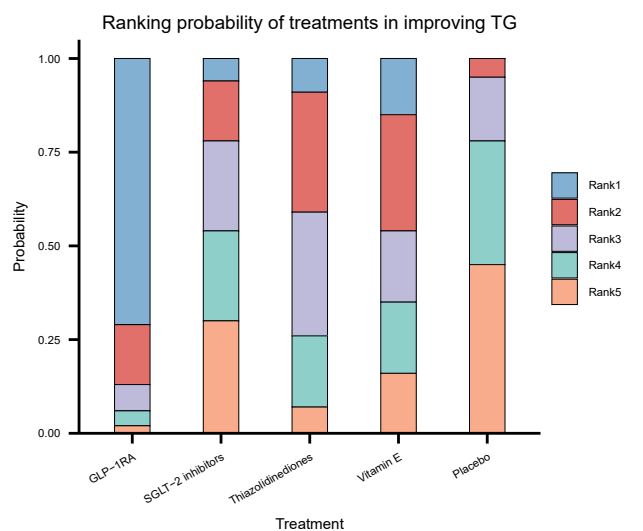
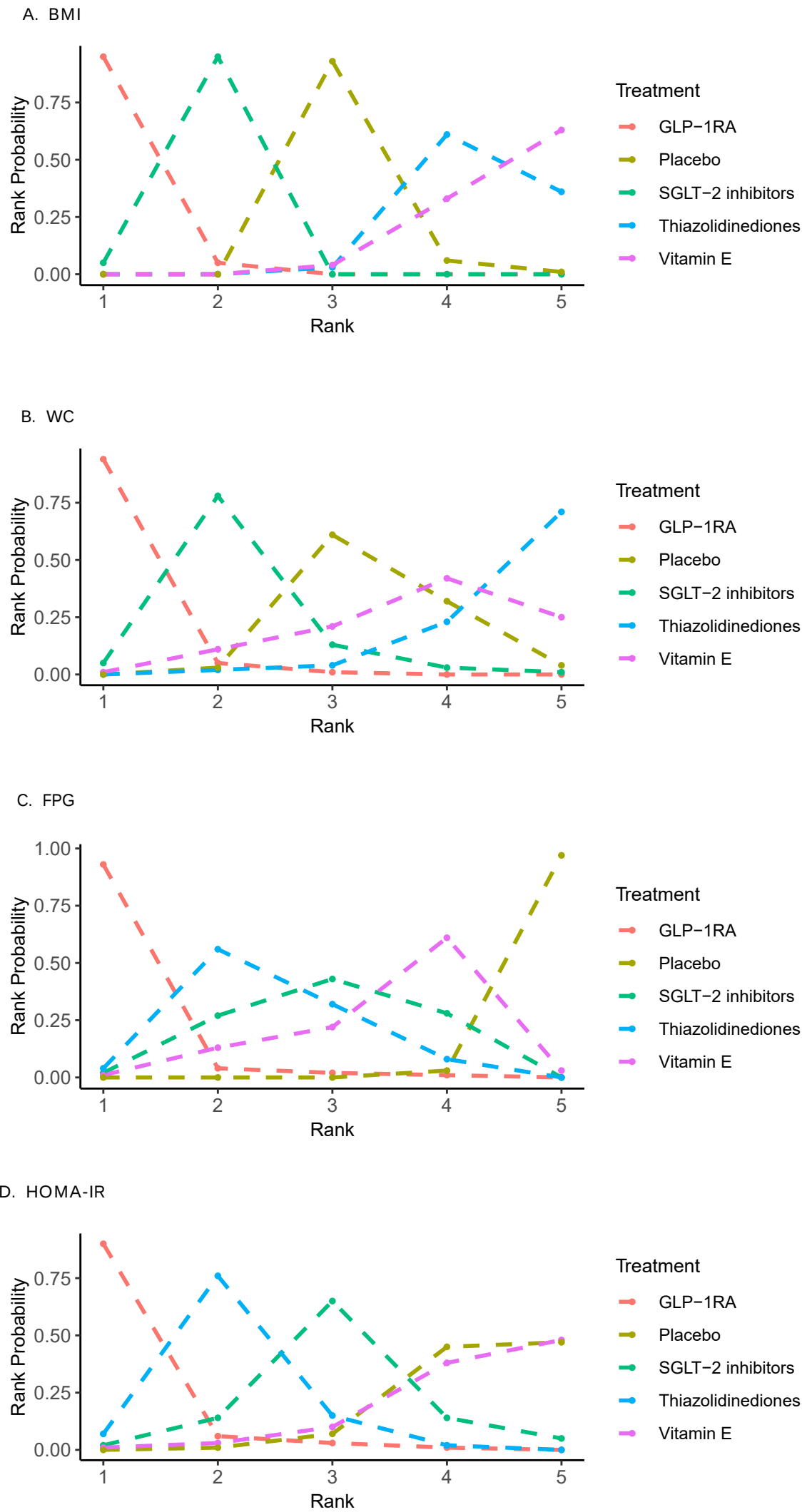


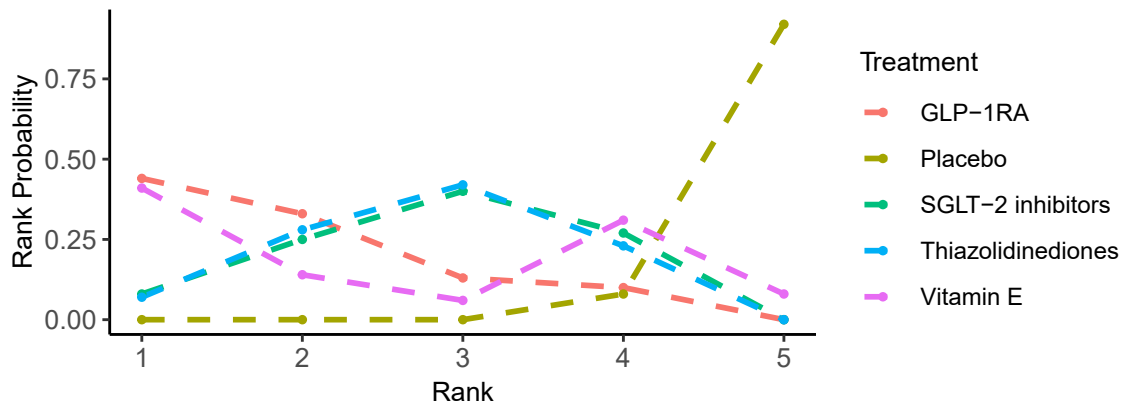
Figure S2 Probability ranking bar chart for each outcome



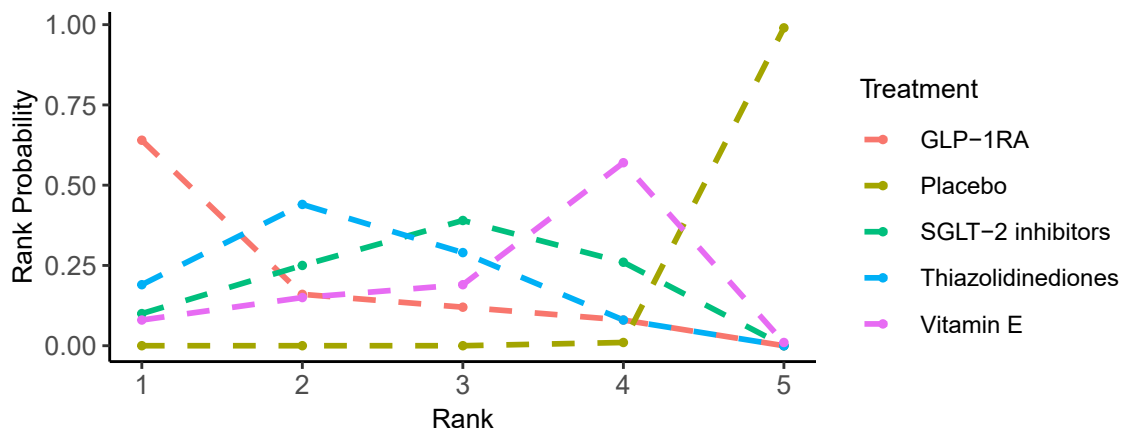




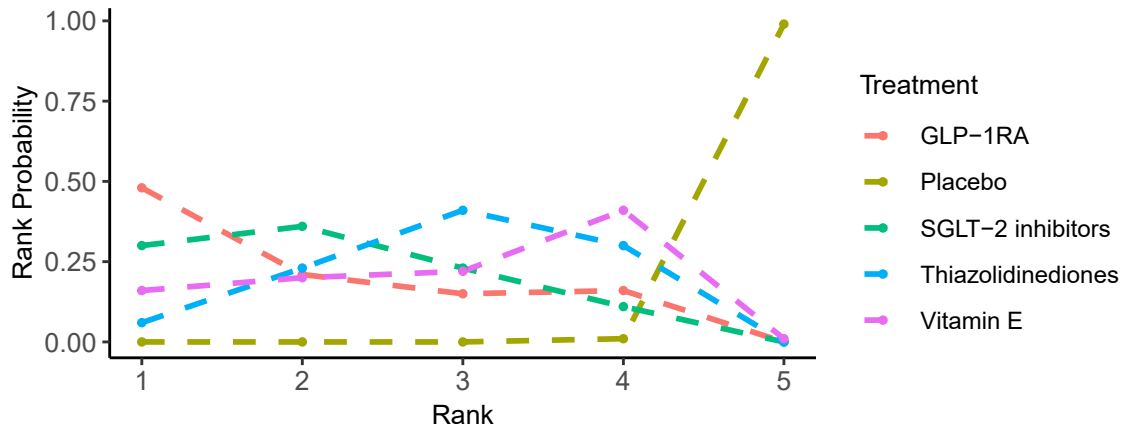
E. HbA1c



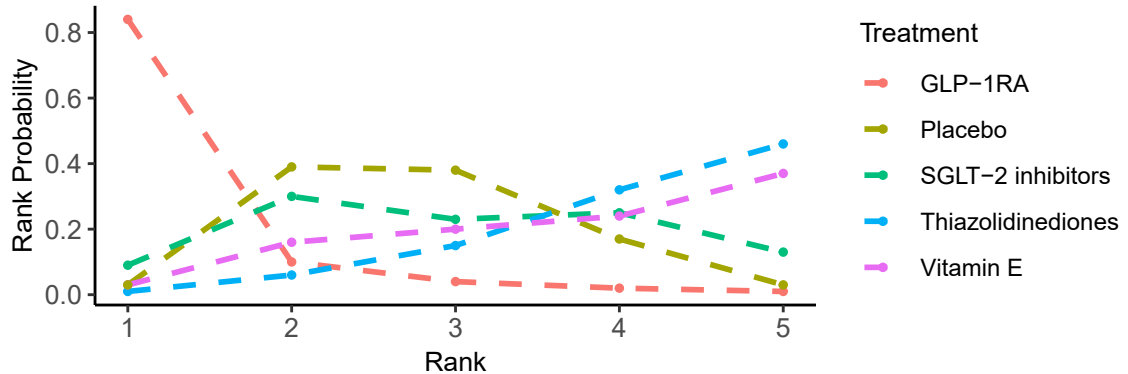
F. ALT



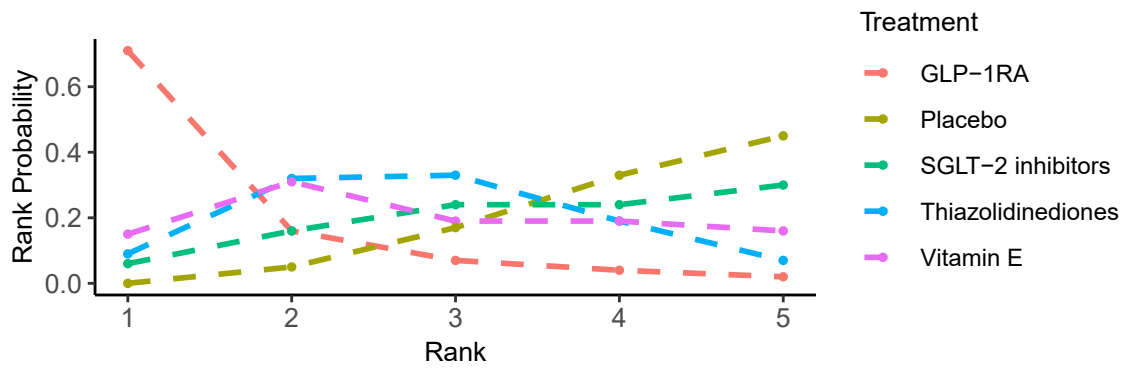
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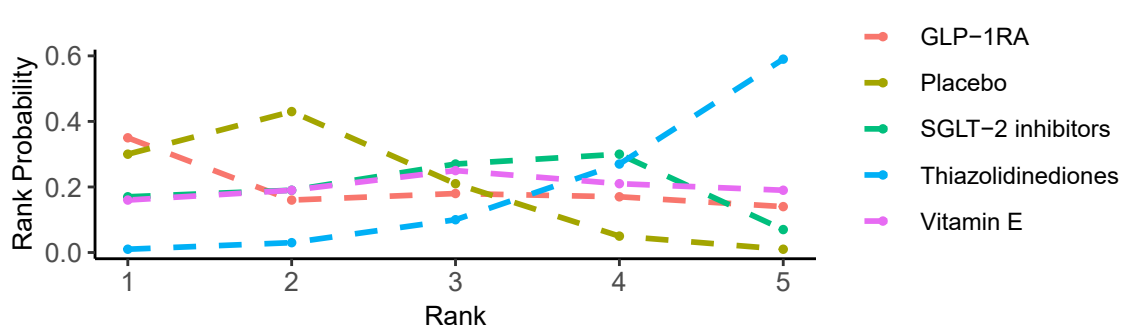
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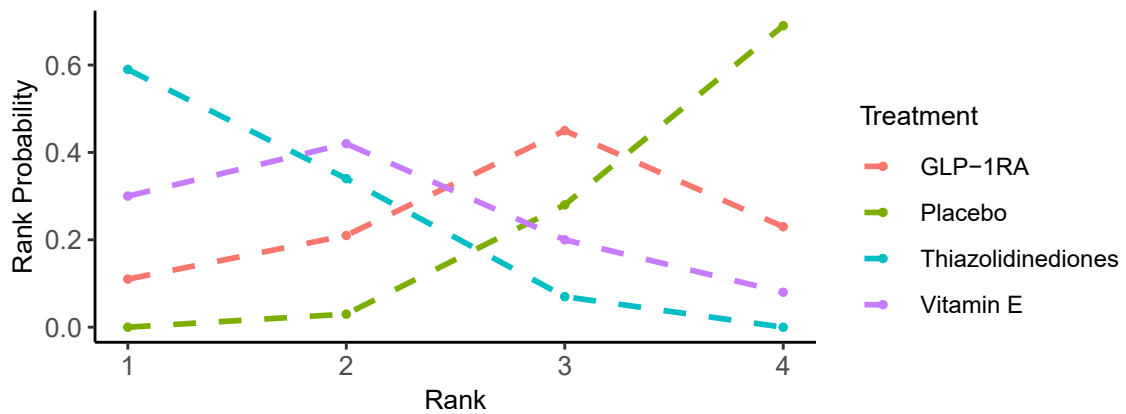
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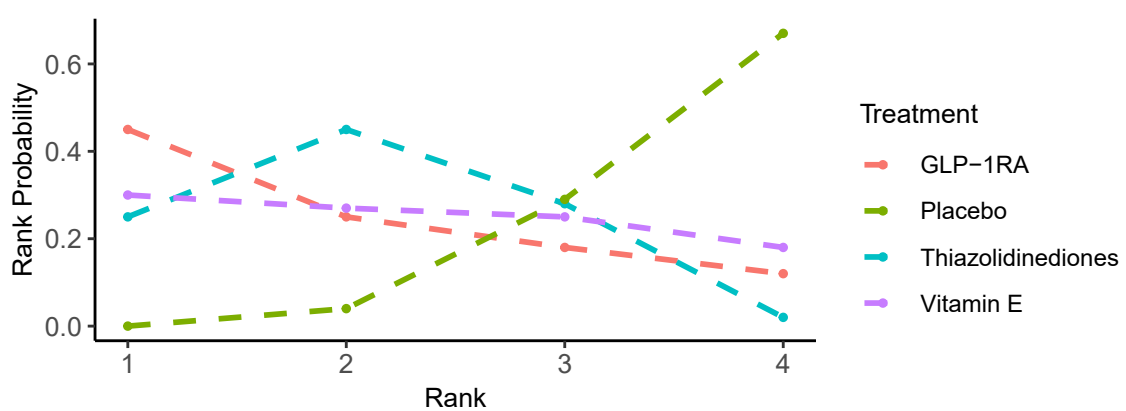
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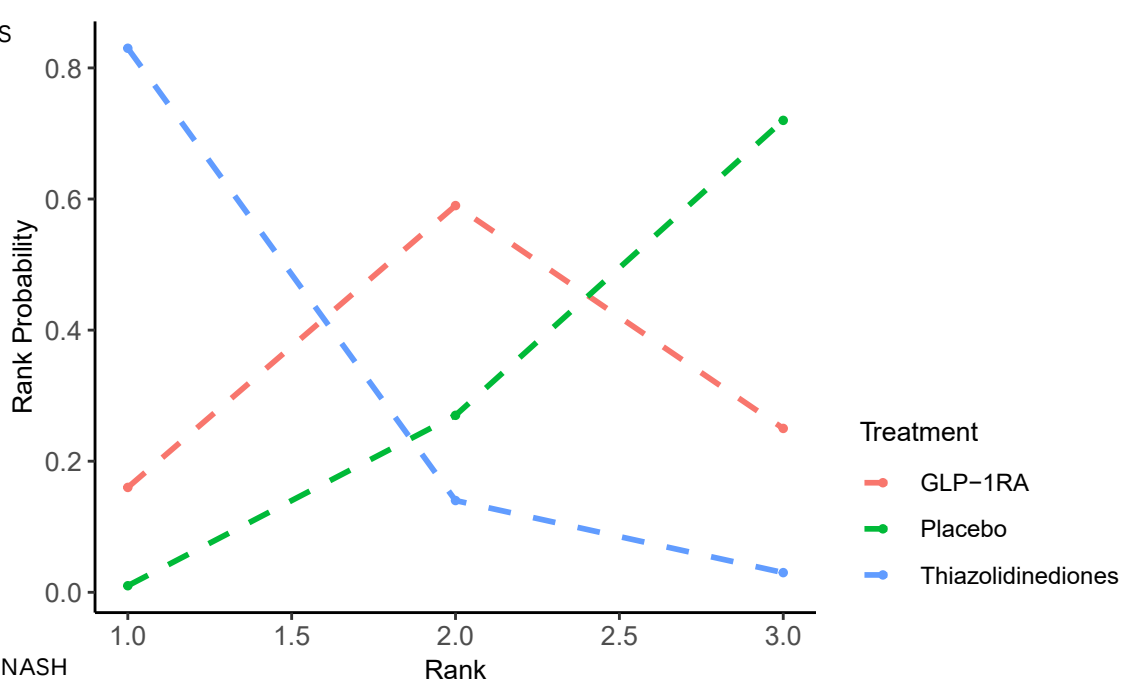
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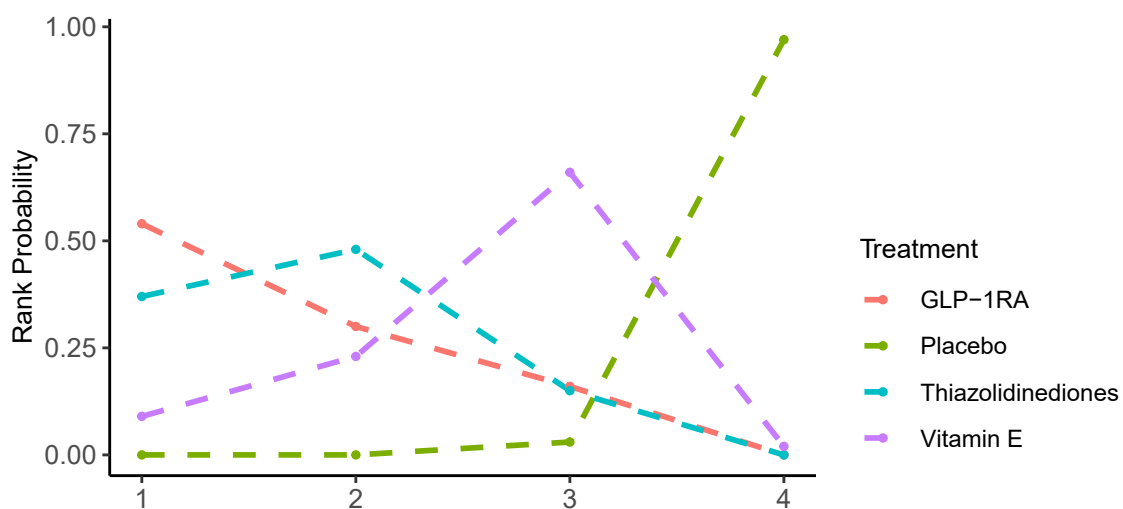
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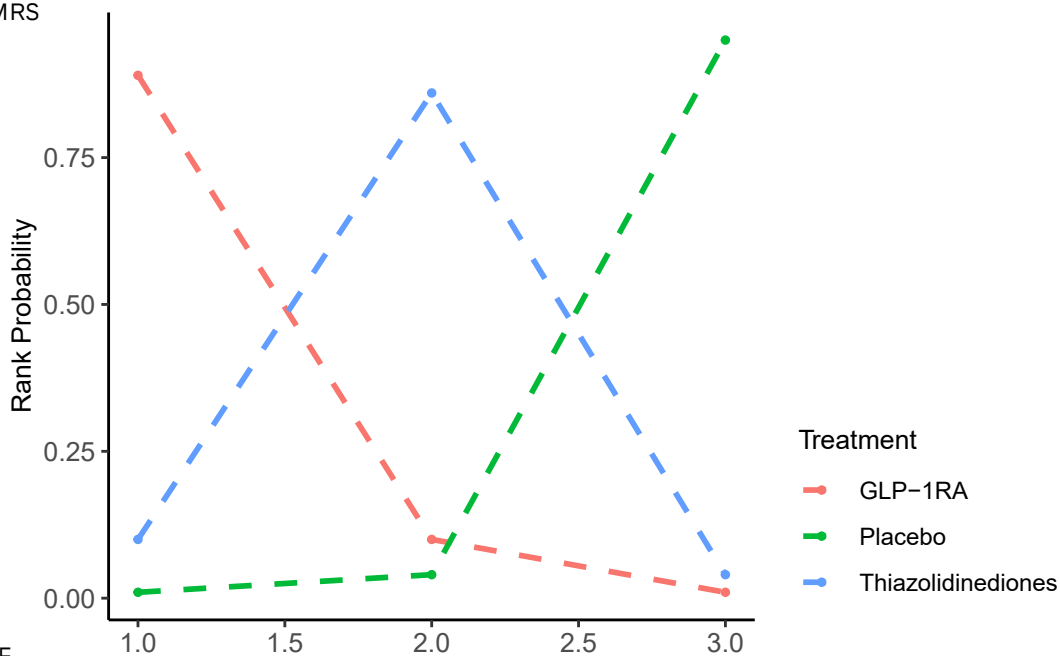
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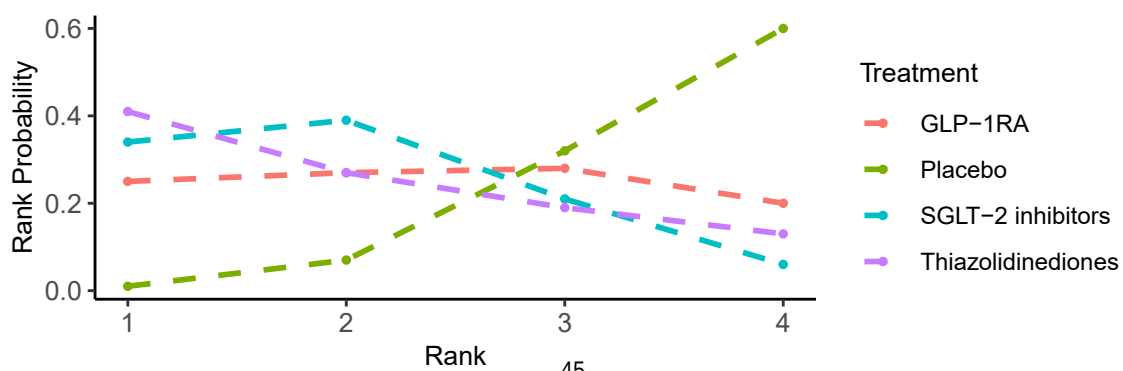
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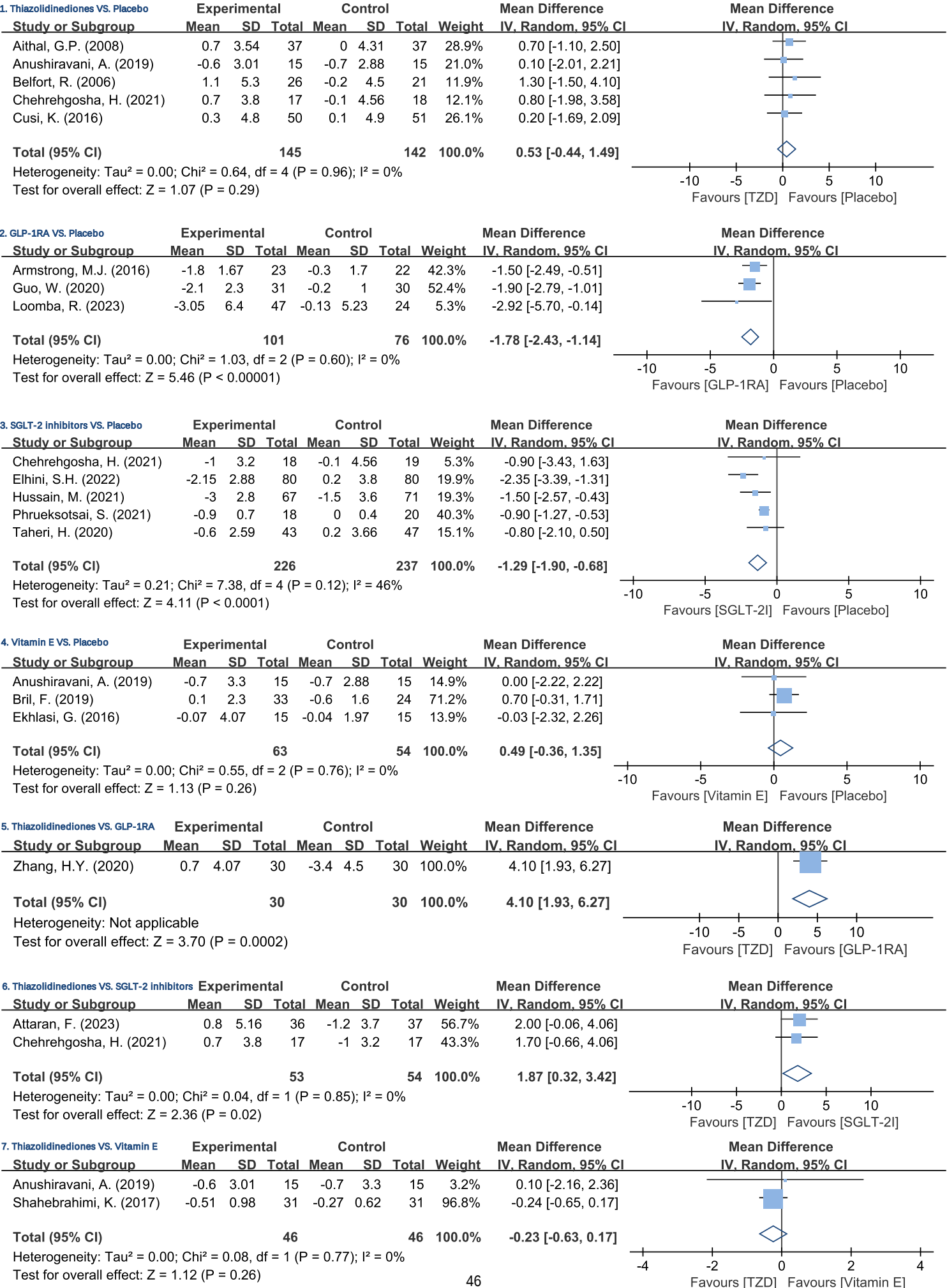


O. H-MRS

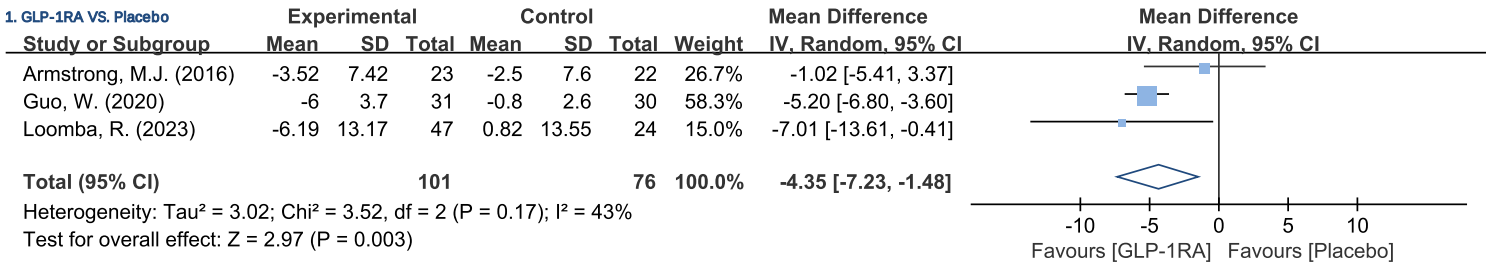


P. PDFF

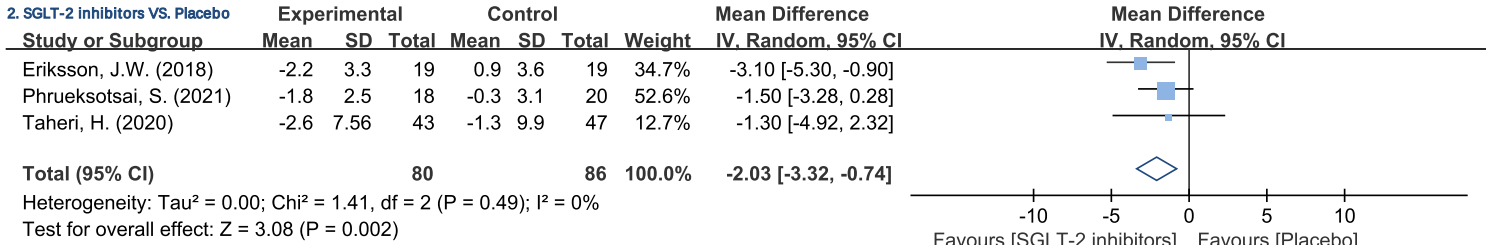




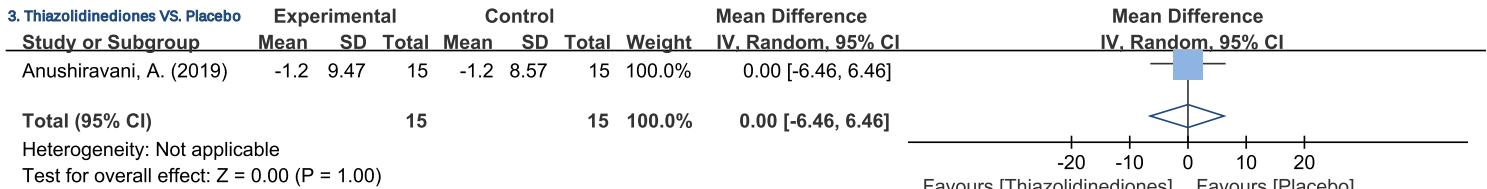
1. GLP-1RA VS. Placebo



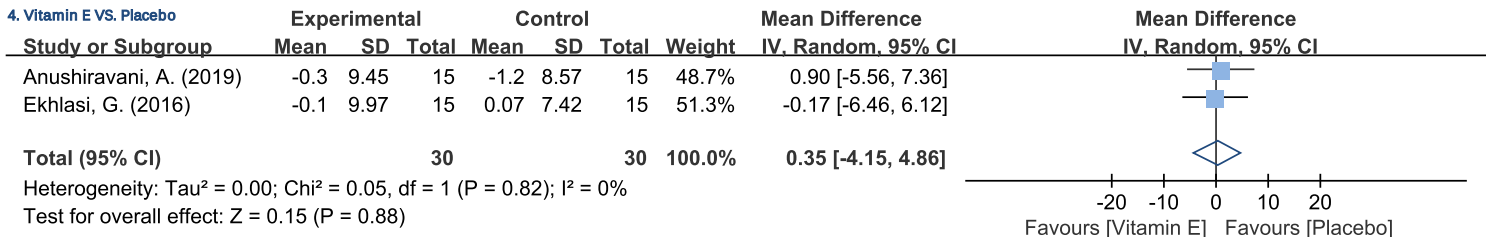
2. SGLT-2 inhibitors VS. Placebo



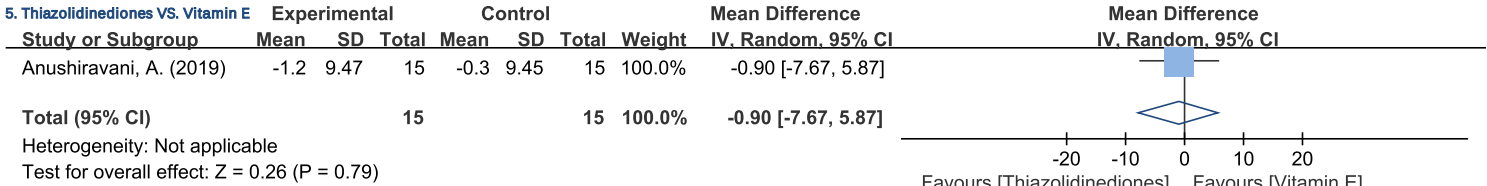
3. Thiazolidinediones VS. Placebo



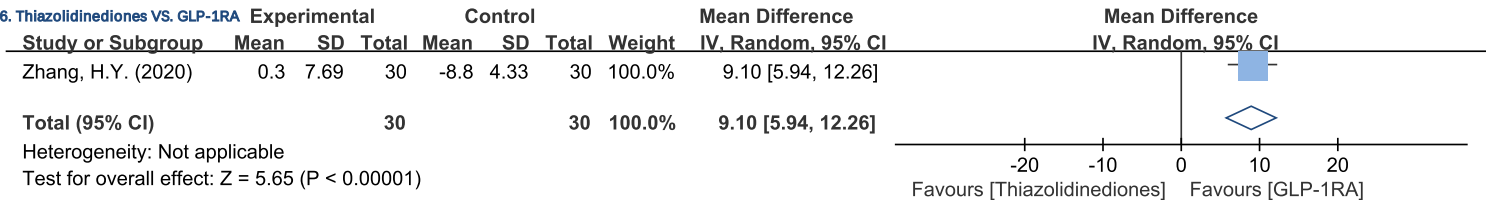
4. Vitamin E VS. Placebo



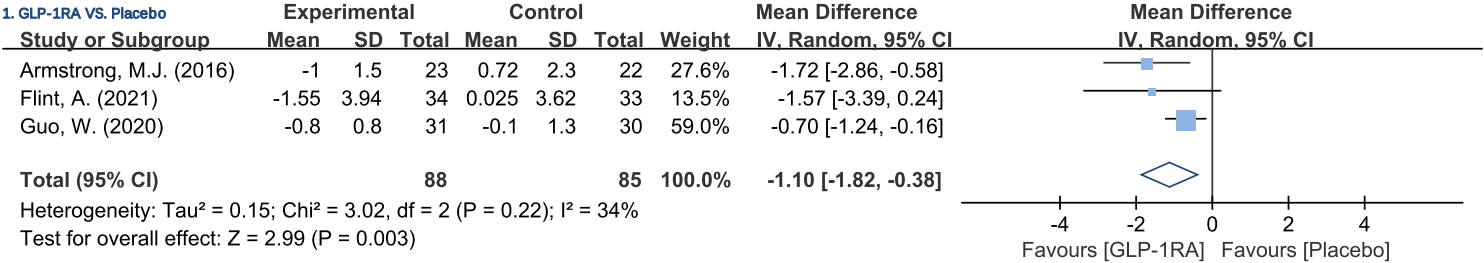
5. Thiazolidinediones VS. Vitamin E



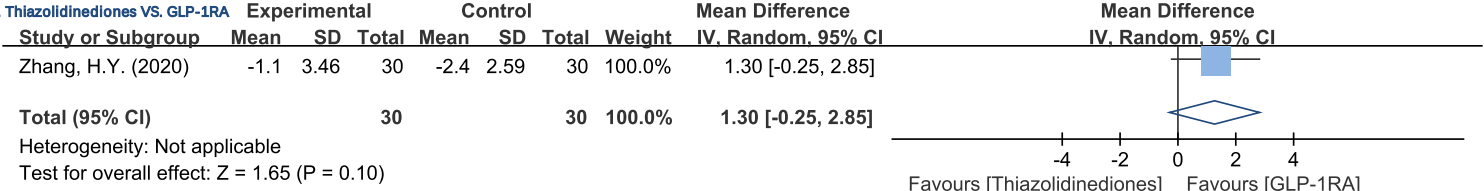
6. Thiazolidinediones VS. GLP-1RA



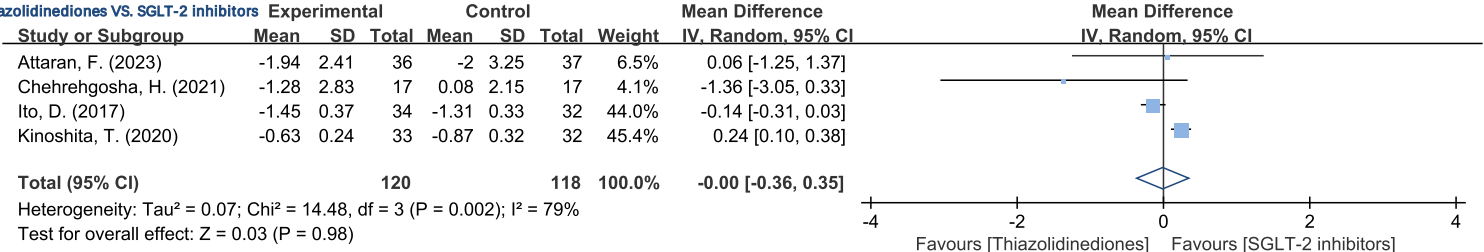
1. GLP-1RA VS. Placebo



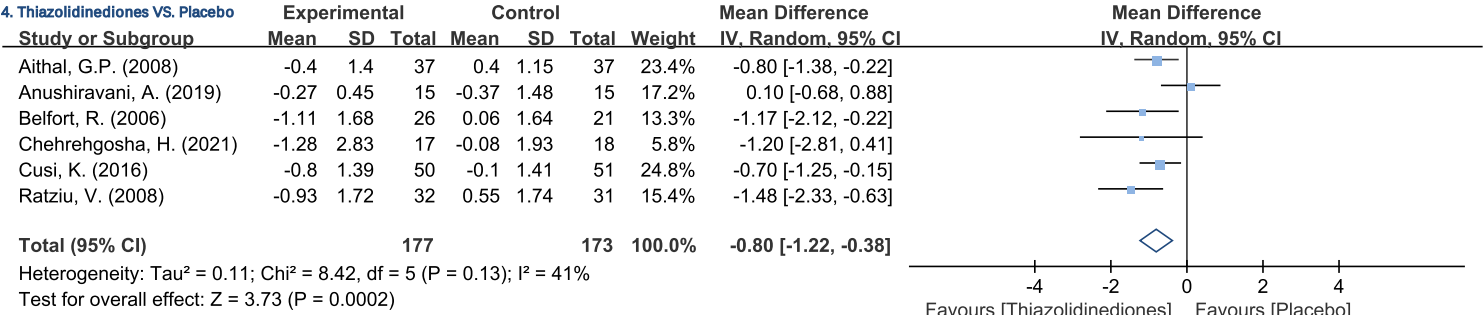
2. Thiazolidinediones VS. GLP-1RA



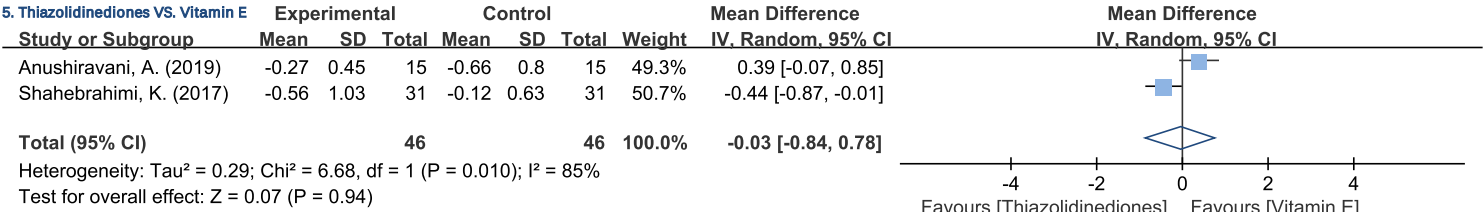
3. Thiazolidinediones VS. SGLT-2 inhibitors



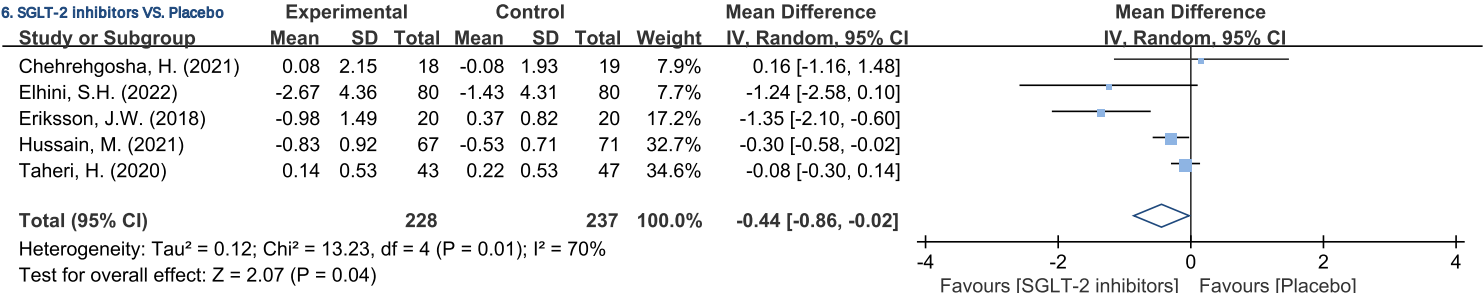
4. Thiazolidinediones VS. Placebo



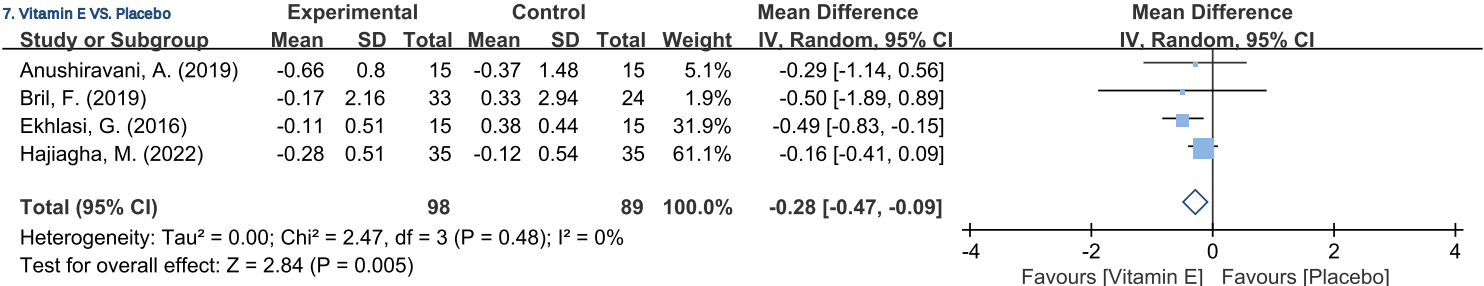
5. Thiazolidinediones VS. Vitamin E



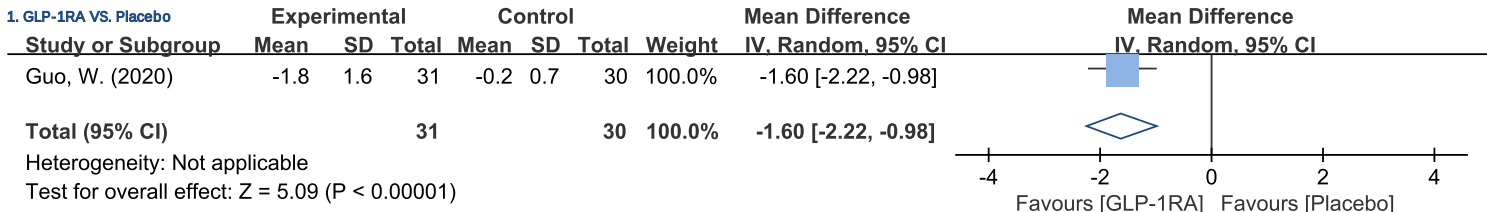
6. SGLT-2 Inhibitors VS. Placebo



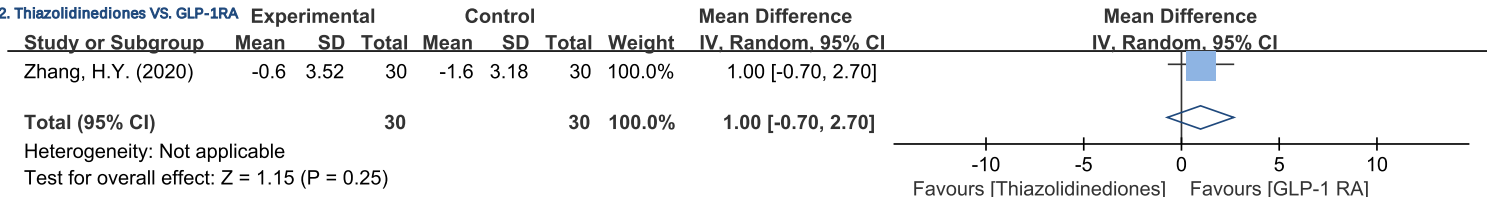
7. Vitamin E VS. Placebo



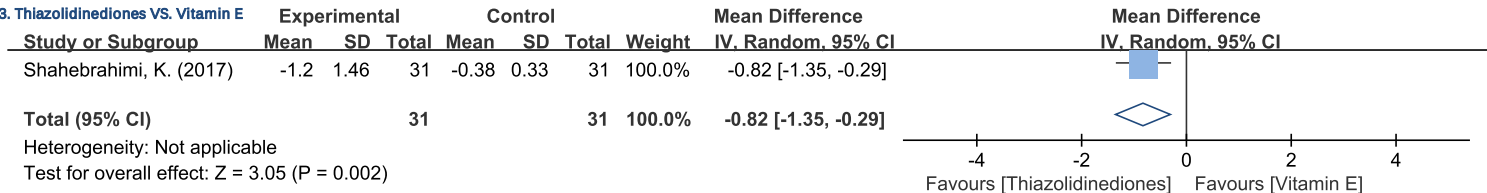
1. GLP-1RA VS. Placebo



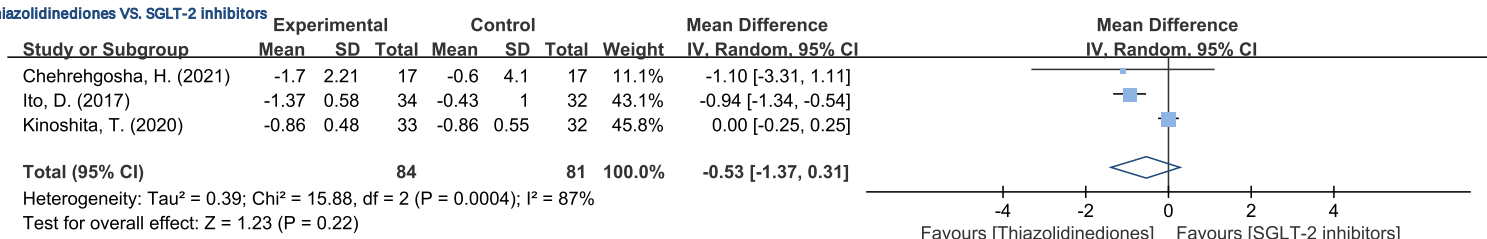
2. Thiazolidinediones VS. GLP-1RA



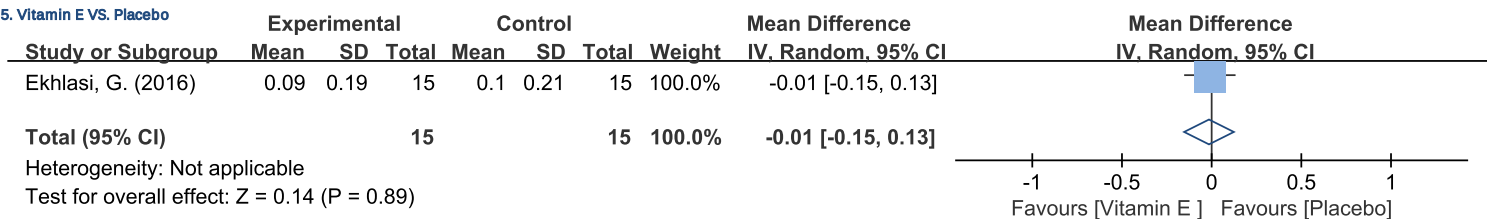
3. Thiazolidinediones VS. Vitamin E



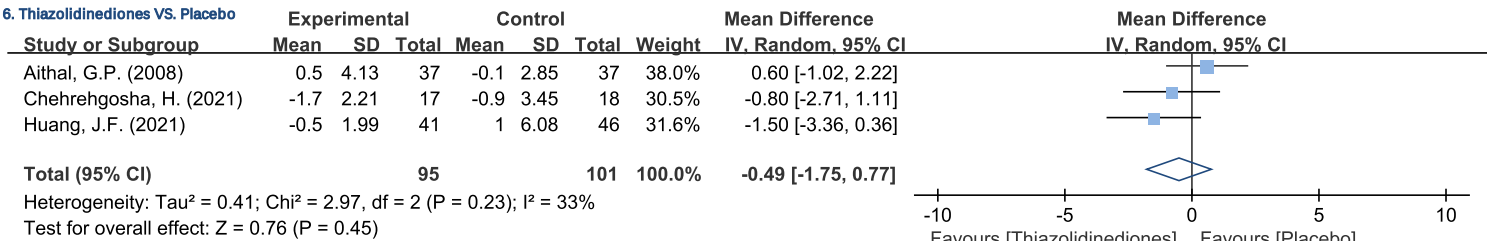
4. Thiazolidinediones VS. SGLT-2 inhibitors



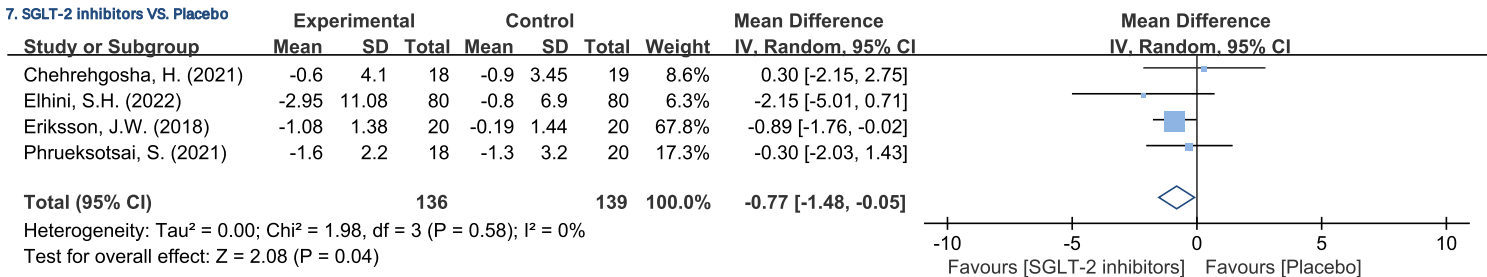
5. Vitamin E VS. Placebo



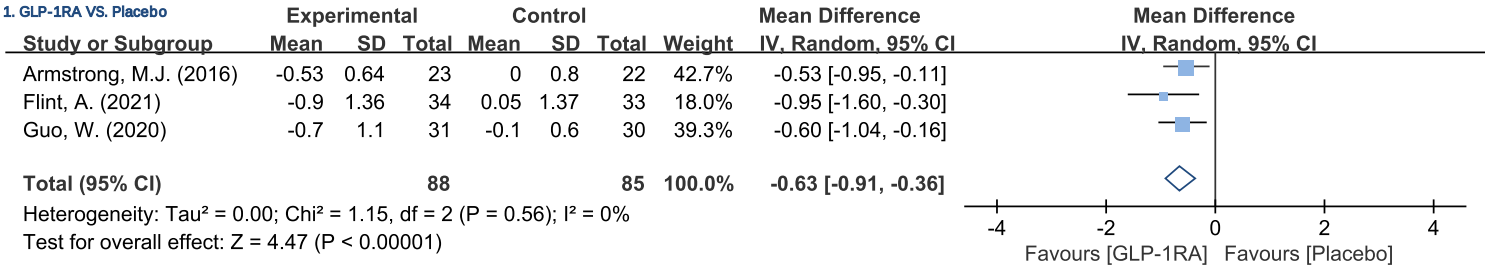
6. Thiazolidinediones VS. Placebo



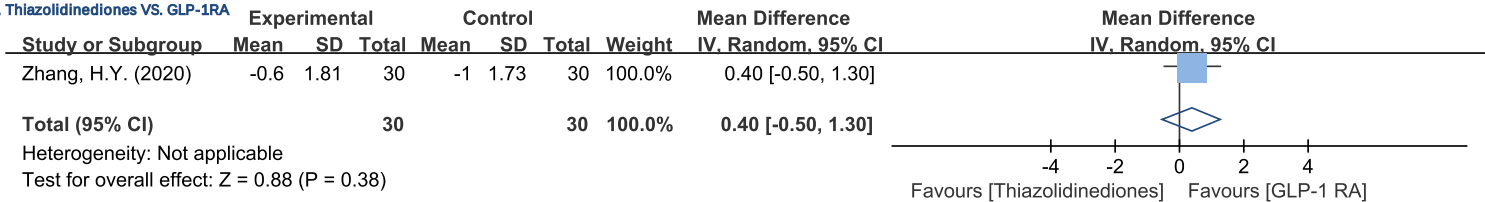
7. SGLT-2 inhibitors VS. Placebo



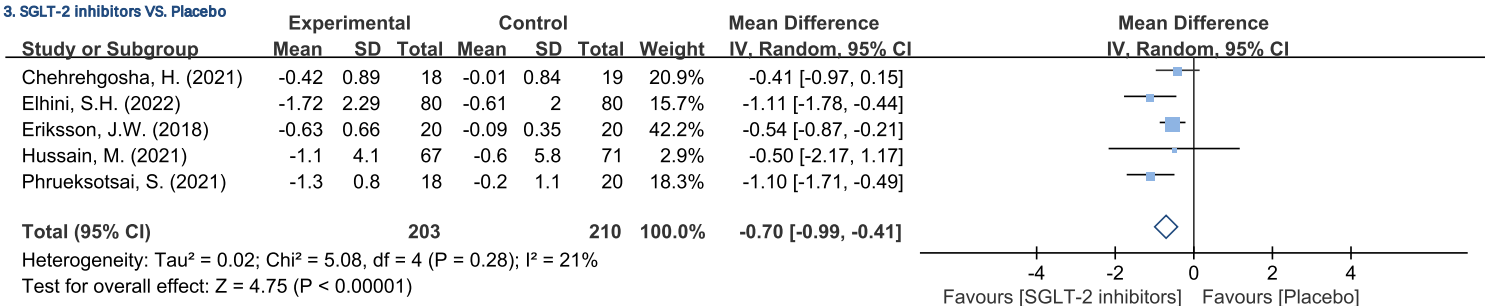
1. GLP-1RA VS. Placebo



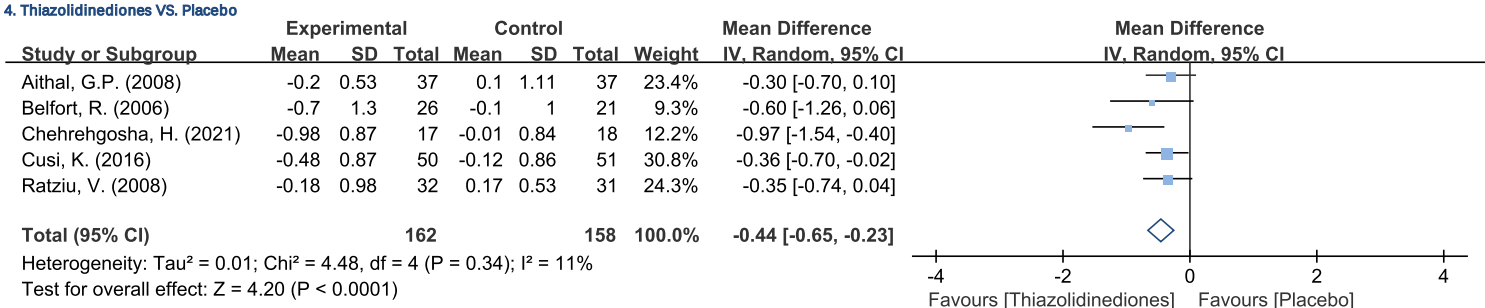
2. Thiazolidinediones VS. GLP-1RA



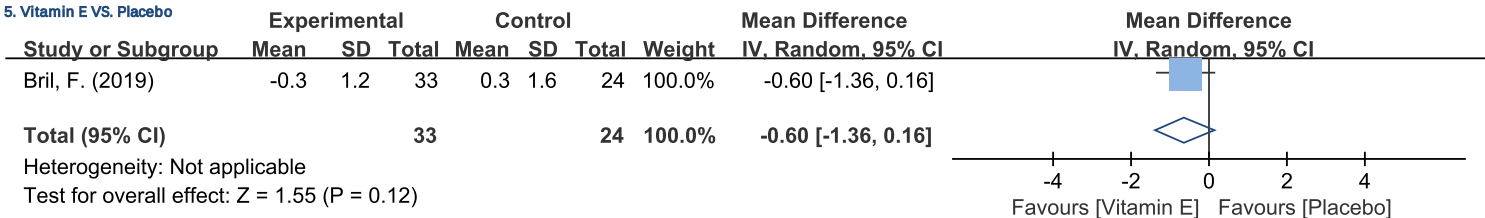
3. SGLT-2 inhibitors VS. Placebo



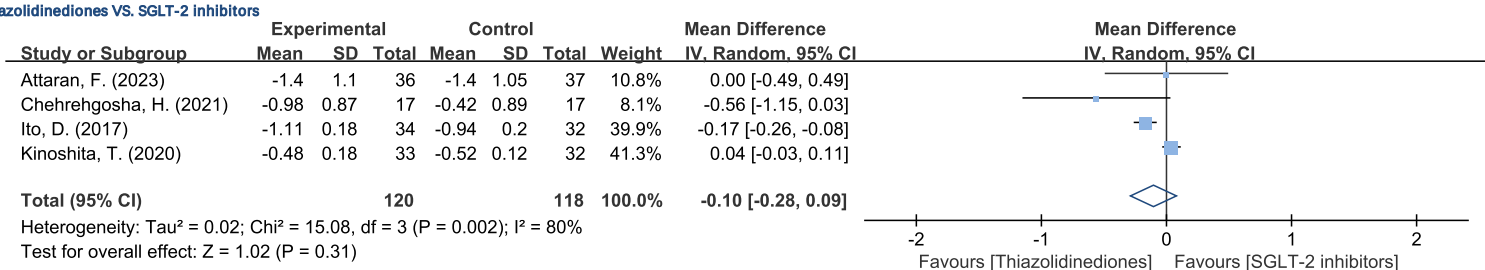
4. Thiazolidinediones VS. Placebo



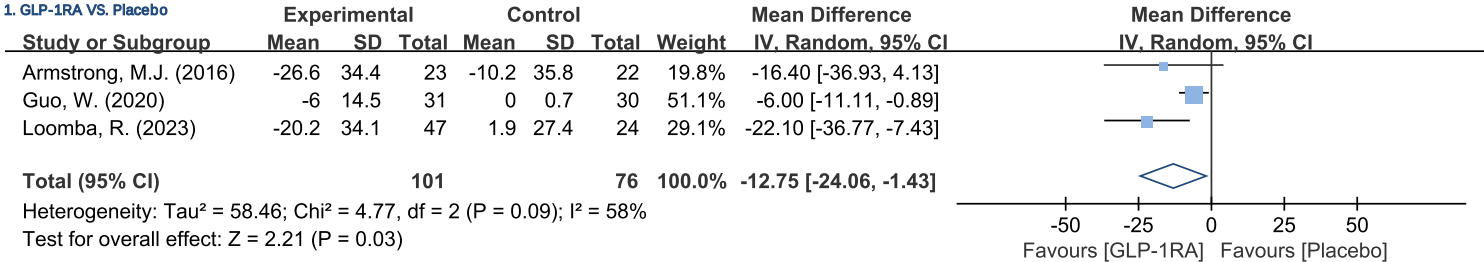
5. Vitamin E VS. Placebo



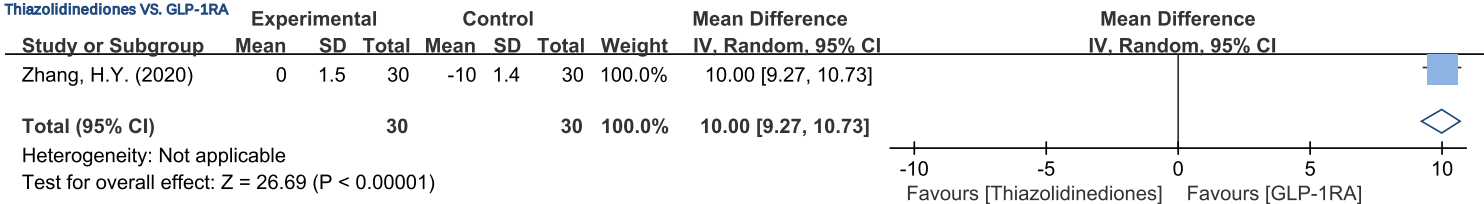
6. Thiazolidinediones VS. SGLT-2 inhibitors



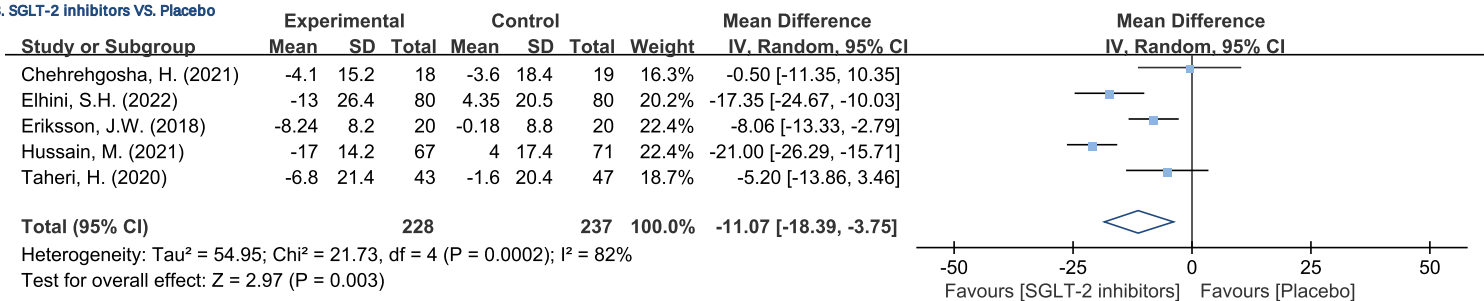
1. GLP-1RA VS. Placebo



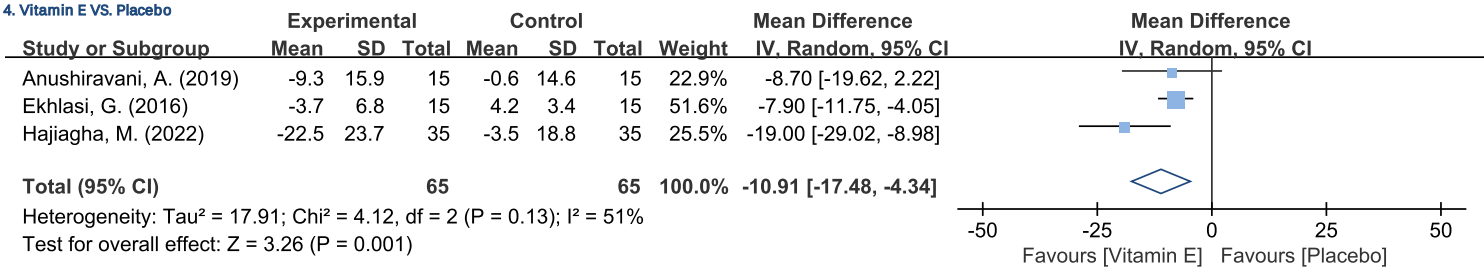
2. Thiazolidinediones VS. GLP-1RA



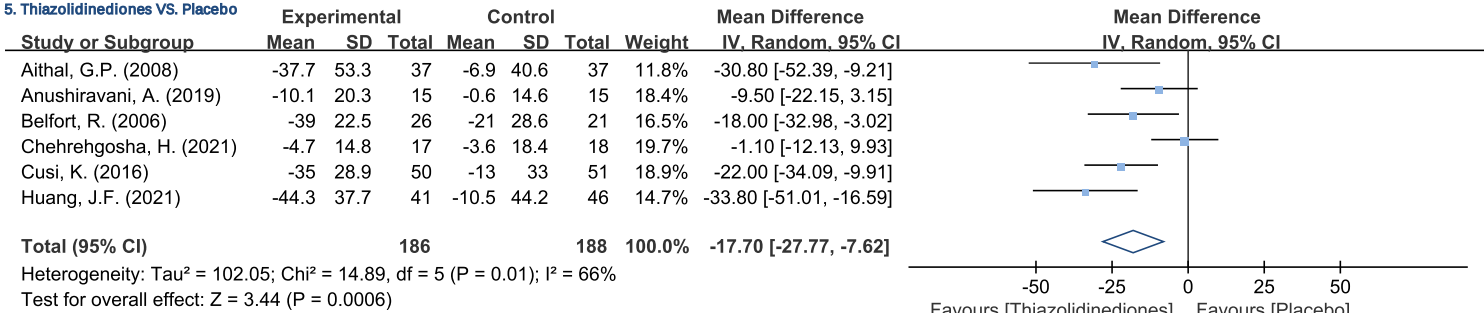
3. SGLT-2 Inhibitors VS. Placebo



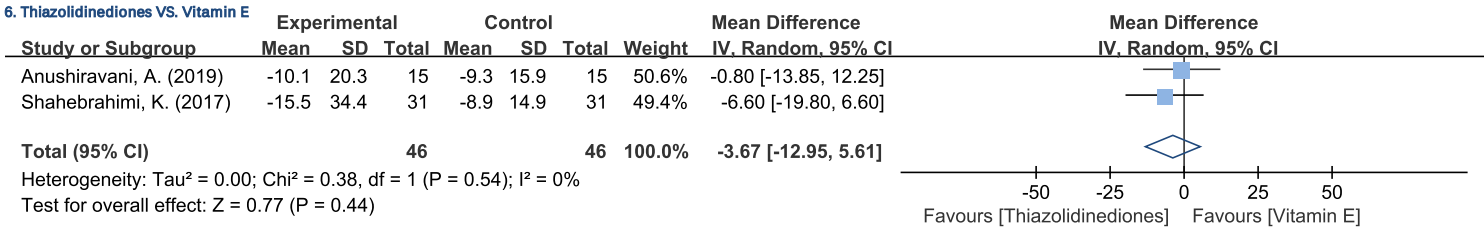
4. Vitamin E VS. Placebo



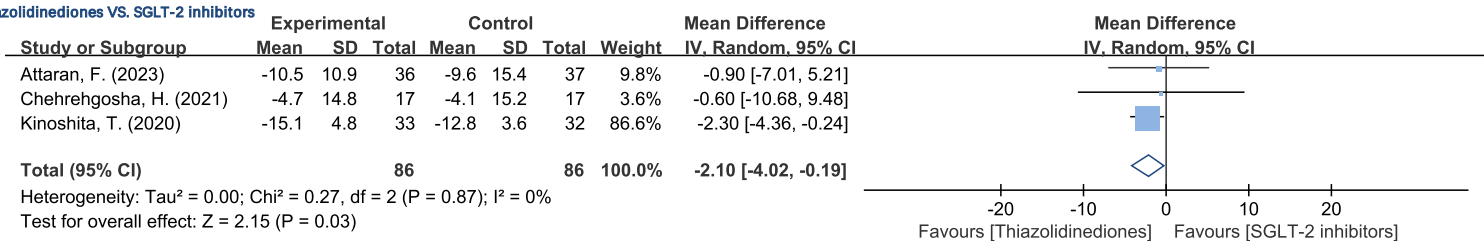
5. Thiazolidinediones VS. Placebo



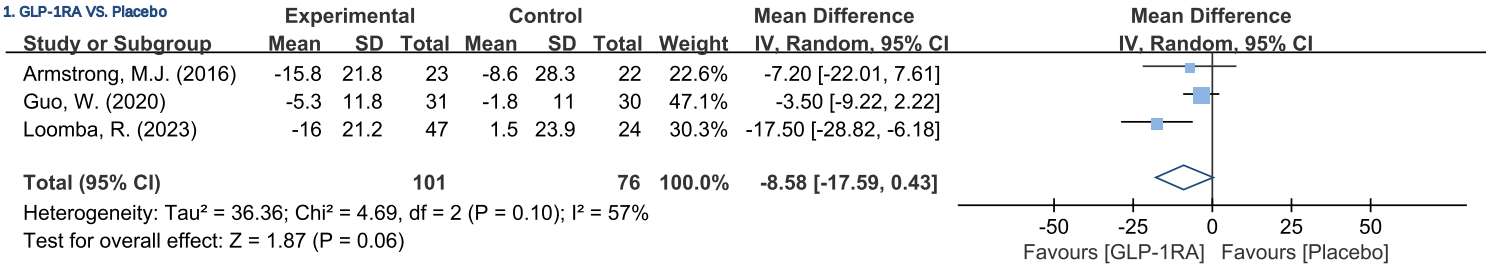
6. Thiazolidinediones VS. Vitamin E



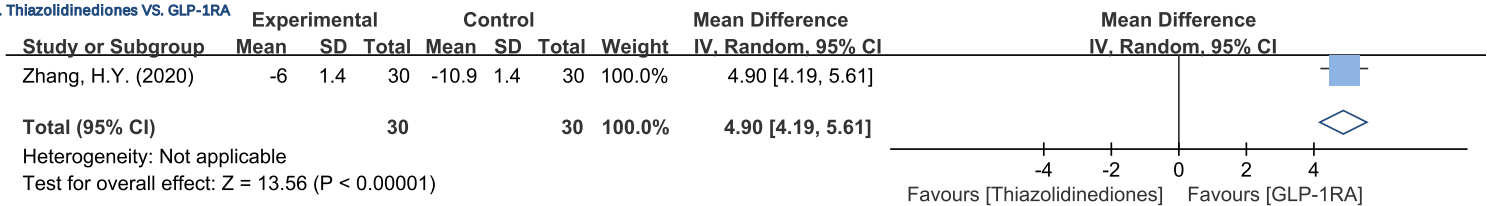
7. Thiazolidinediones VS. SGLT-2 Inhibitors



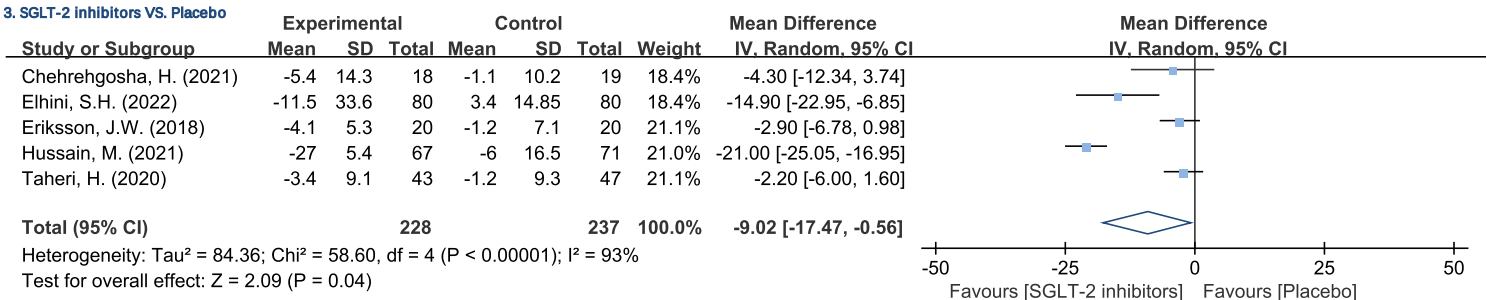
1. GLP-1RA VS. Placebo



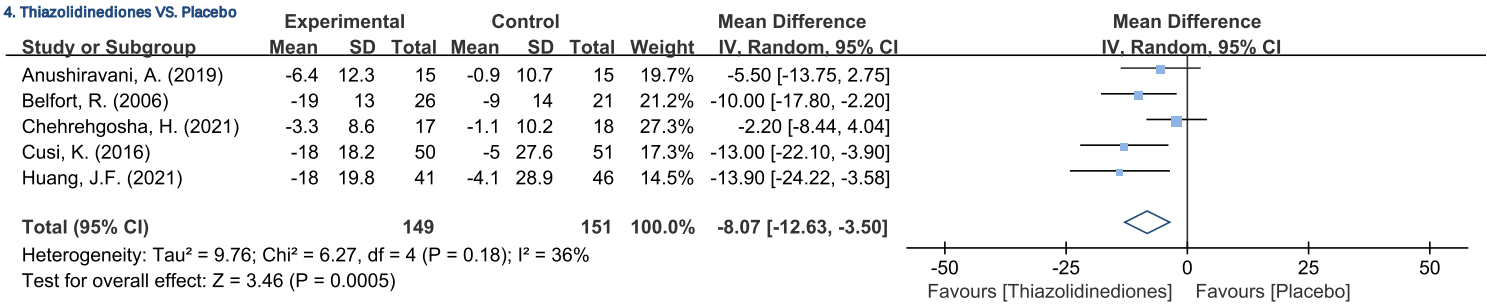
2. Thiazolidinediones VS. GLP-1RA



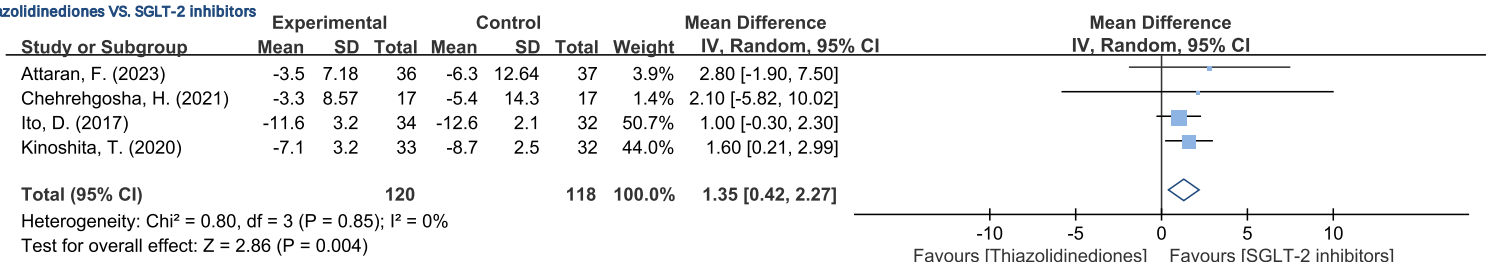
3. SGLT-2 inhibitors VS. Placebo



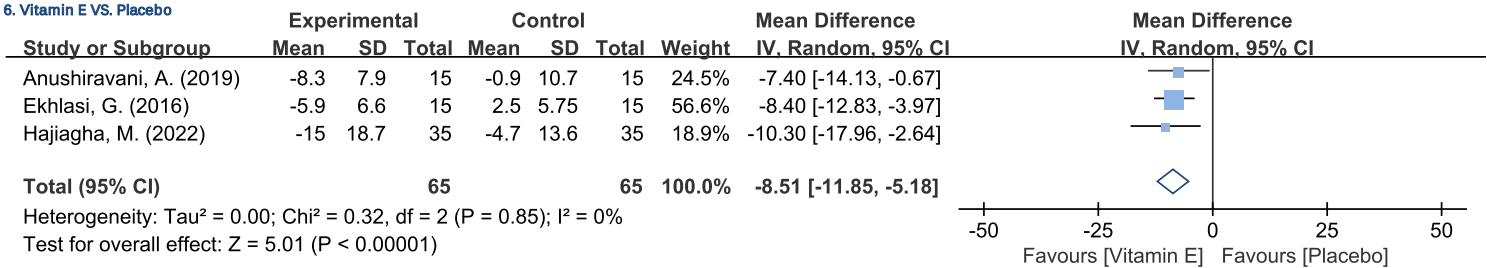
4. Thiazolidinediones VS. Placebo



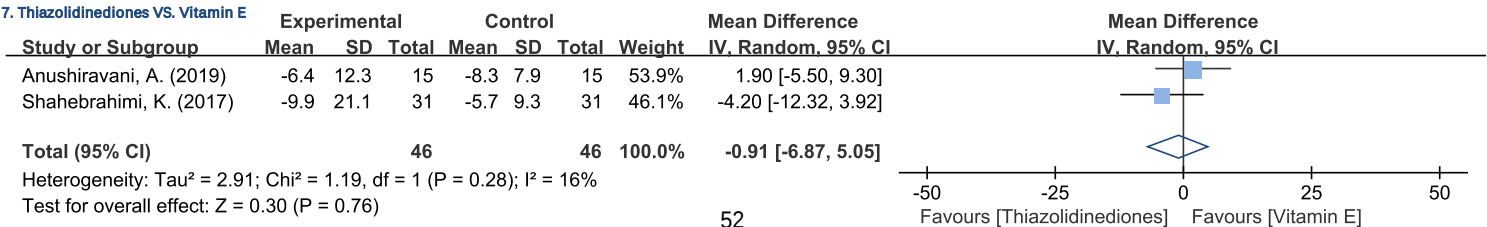
5. Thiazolidinediones VS. SGLT-2 Inhibitors



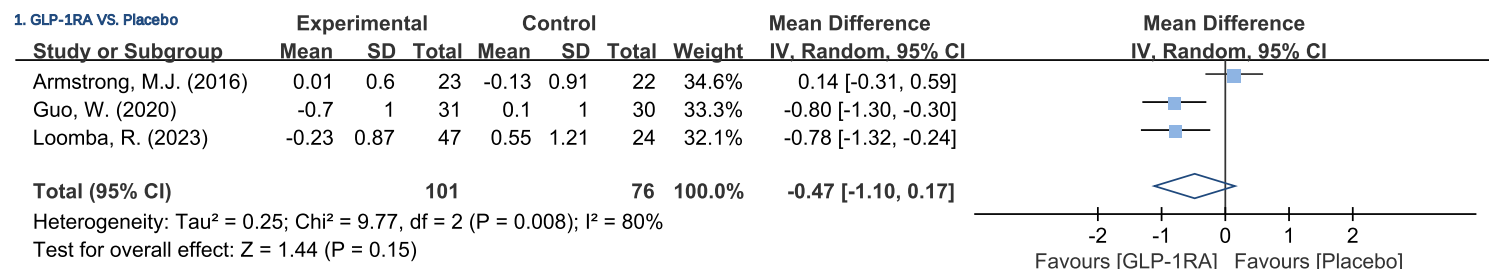
6. Vitamin E VS. Placebo



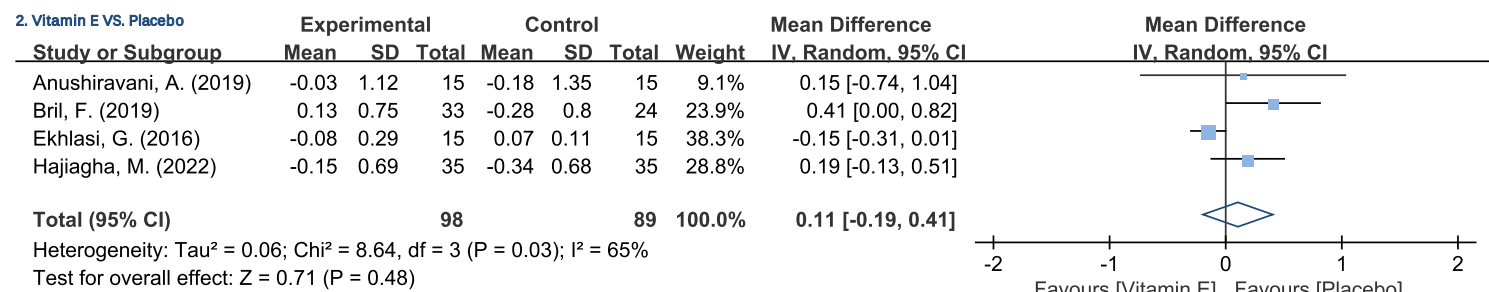
7. Thiazolidinediones VS. Vitamin E



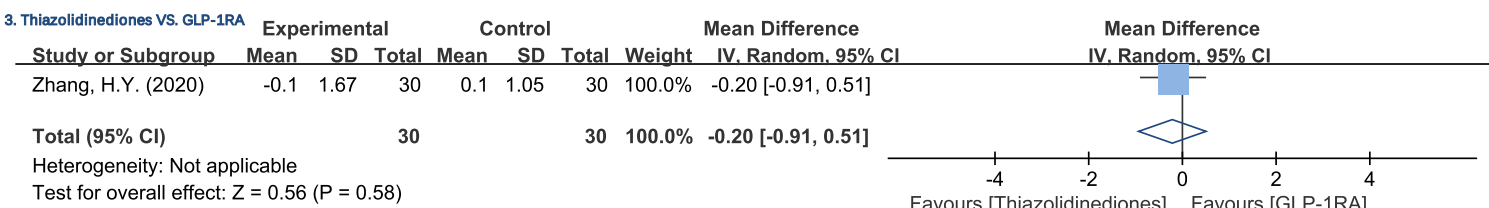
1. GLP-1RA VS. Placebo



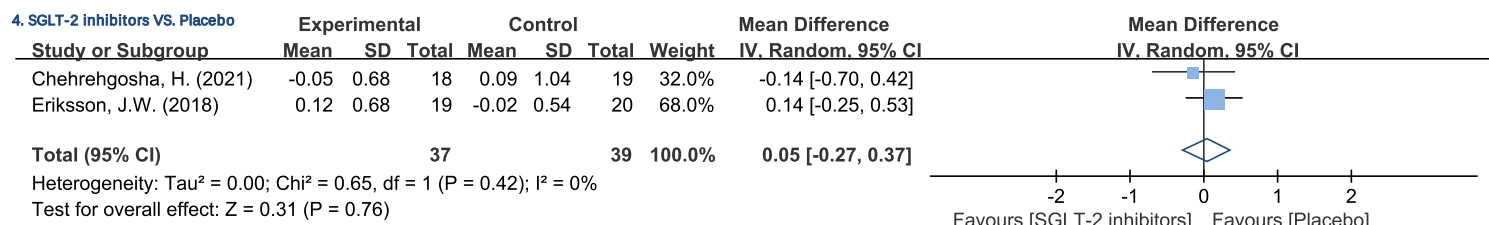
2. Vitamin E VS. Placebo



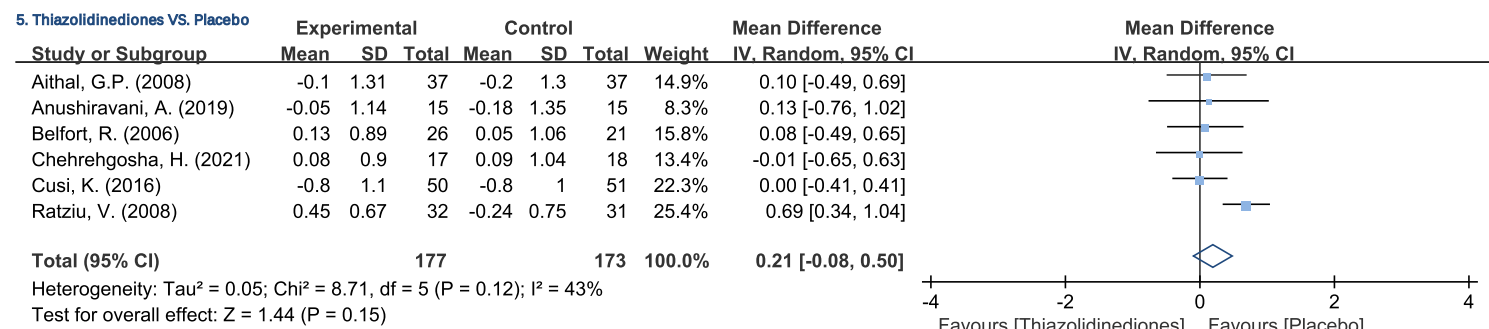
3. Thiazolidinediones VS. GLP-1RA



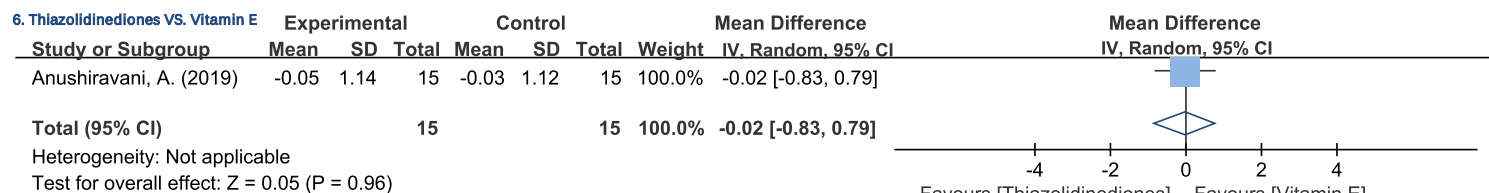
4. SGLT-2 inhibitors VS. Placebo



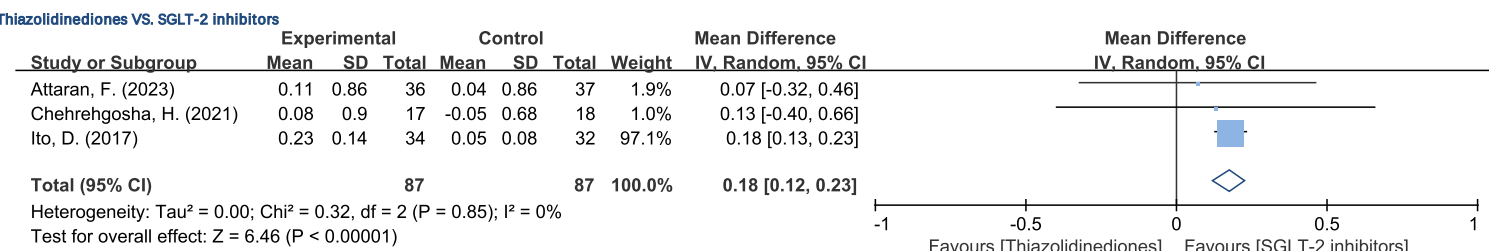
5. Thiazolidinediones VS. Placebo



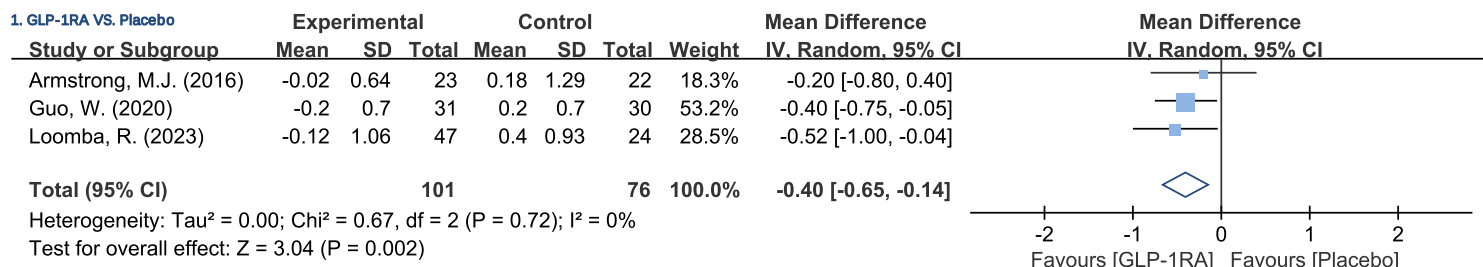
6. Thiazolidinediones VS. Vitamin E



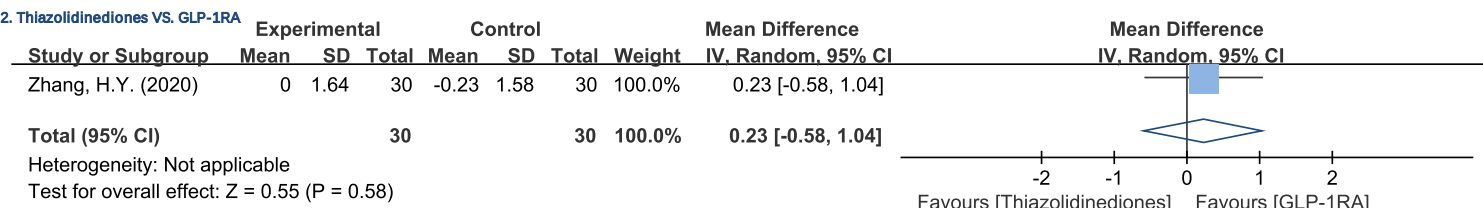
7. Thiazolidinediones VS. SGLT-2 inhibitors



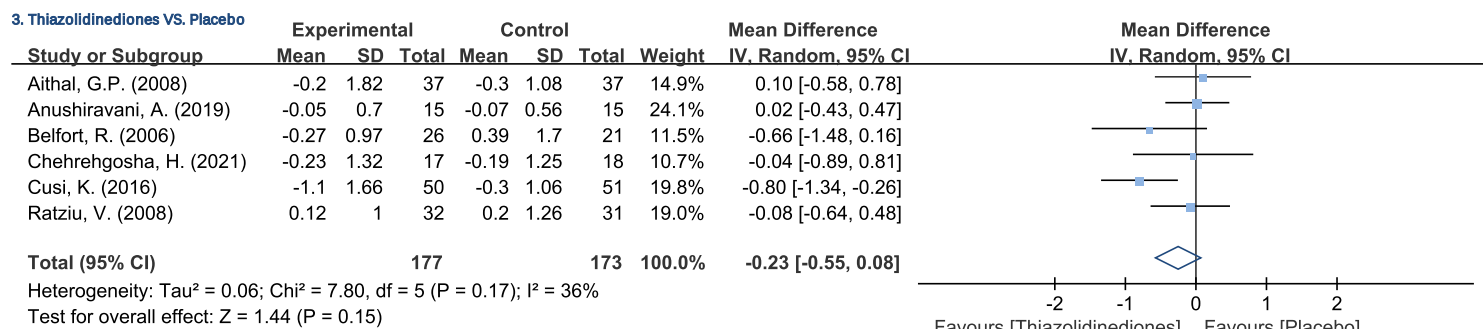
1. GLP-1RA VS. Placebo



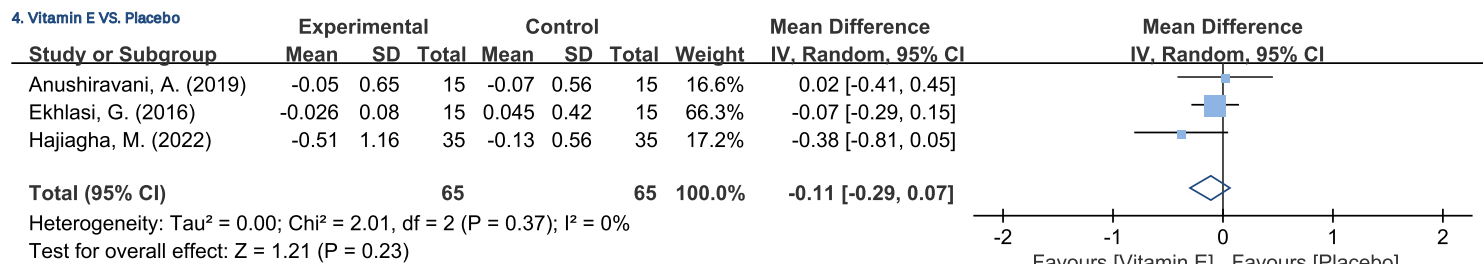
2. Thiazolidinediones VS. GLP-1RA



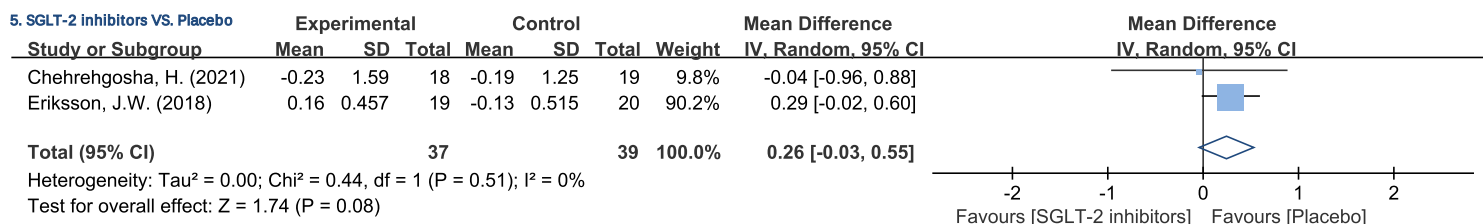
3. Thiazolidinediones VS. Placebo



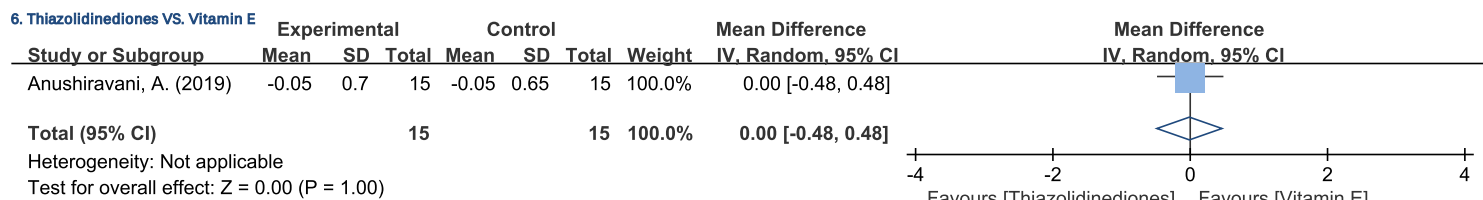
4. Vitamin E VS. Placebo



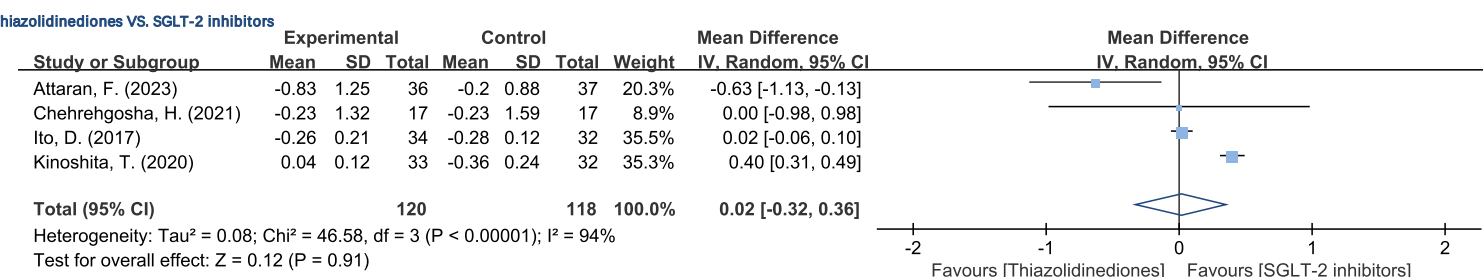
5. SGLT-2 inhibitors VS. Placebo



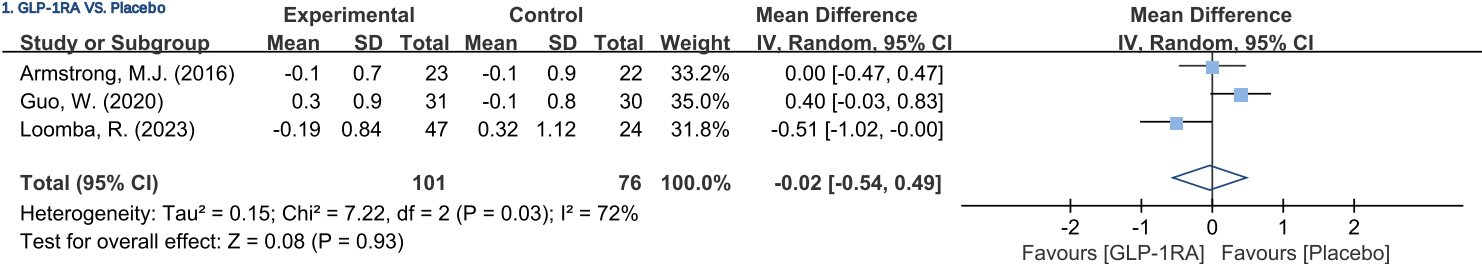
6. Thiazolidinediones VS. Vitamin E



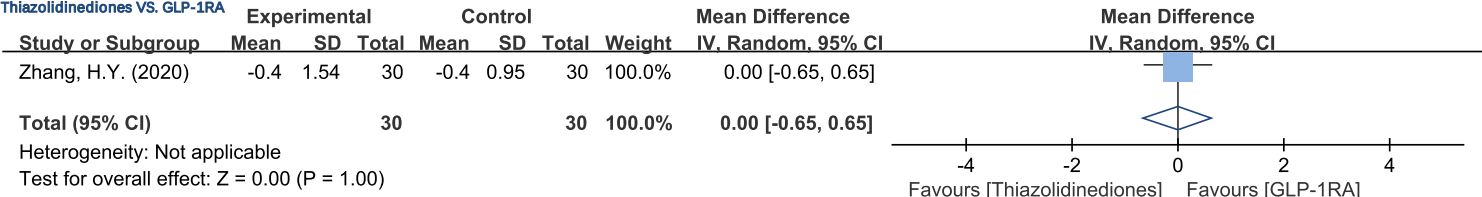
7. Thiazolidinediones VS. SGLT-2 inhibitors



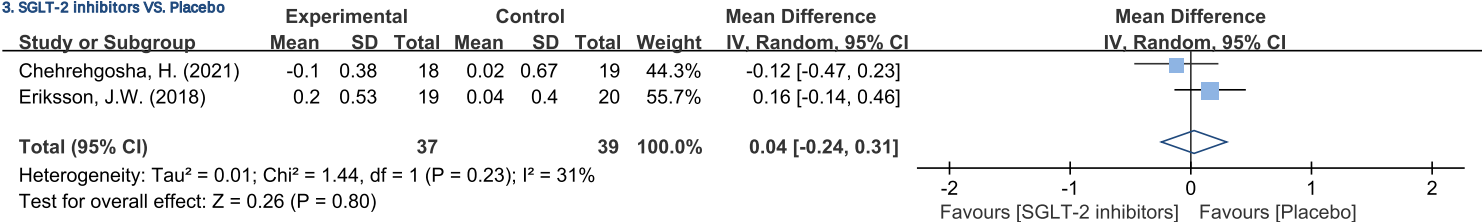
1. GLP-1RA VS. Placebo



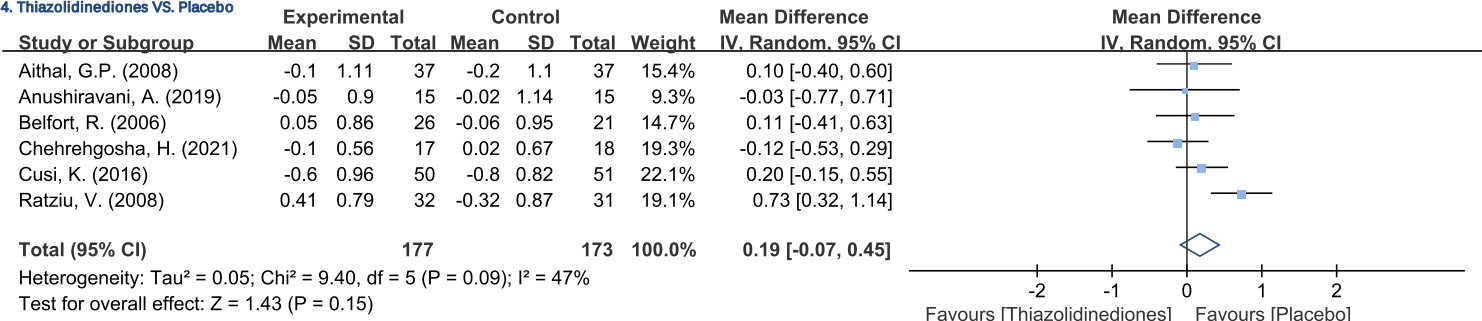
2. Thiazolidinediones VS. GLP-1RA



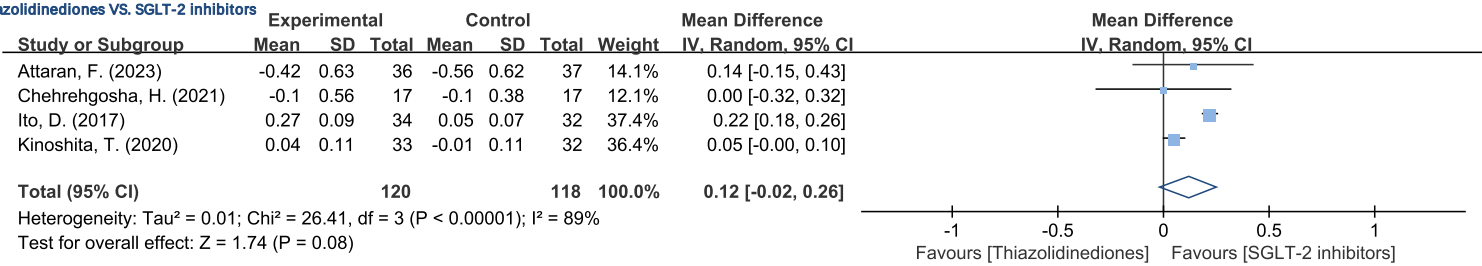
3. SGLT-2 inhibitors VS. Placebo



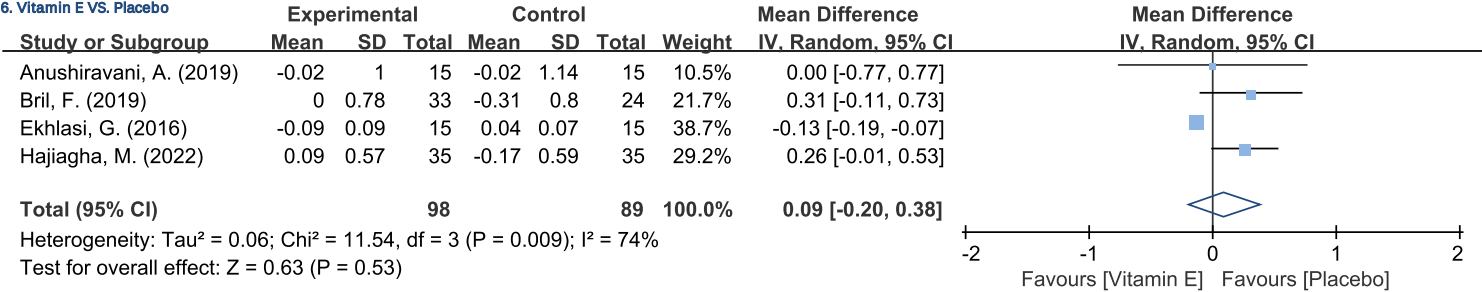
4. Thiazolidinediones VS. Placebo



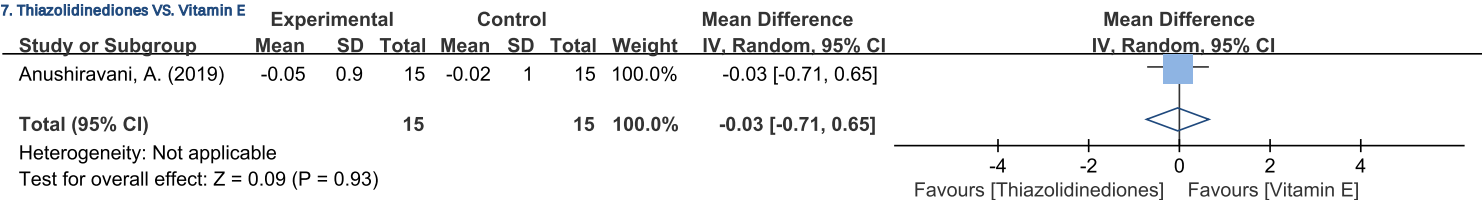
5. Thiazolidinediones VS. SGLT-2 inhibitors



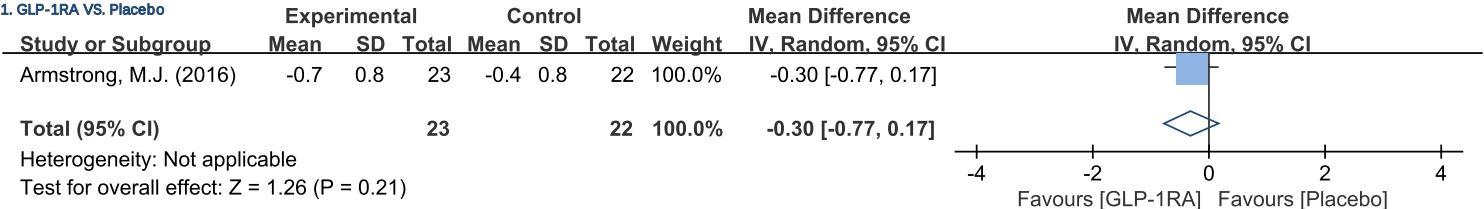
6. Vitamin E VS. Placebo



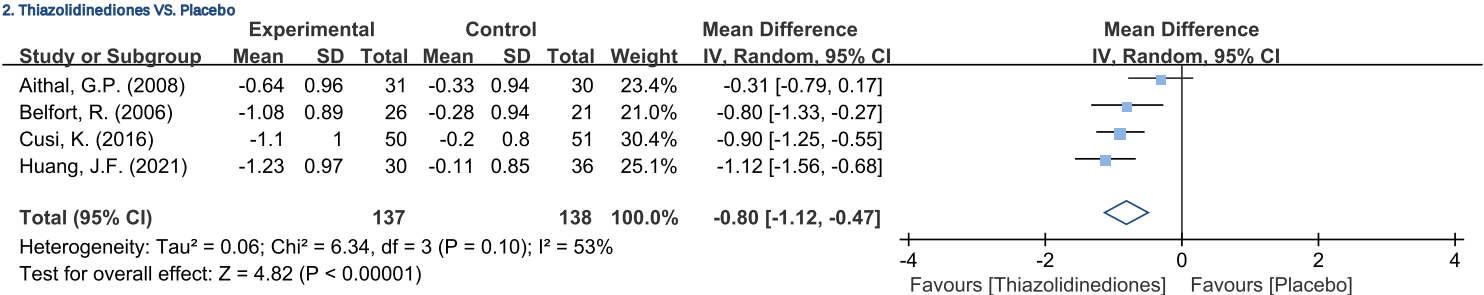
7. Thiazolidinediones VS. Vitamin E



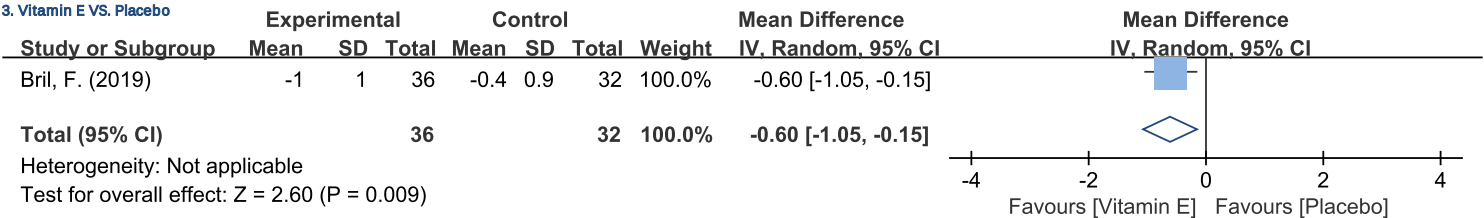
1. GLP-1RA VS. Placebo



2. Thiazolidinediones VS. Placebo

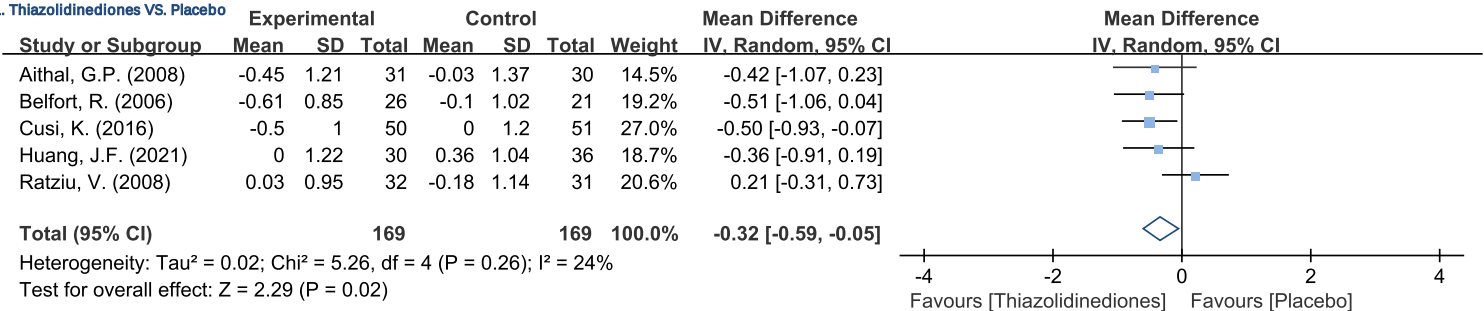


3. Vitamin E VS. Placebo

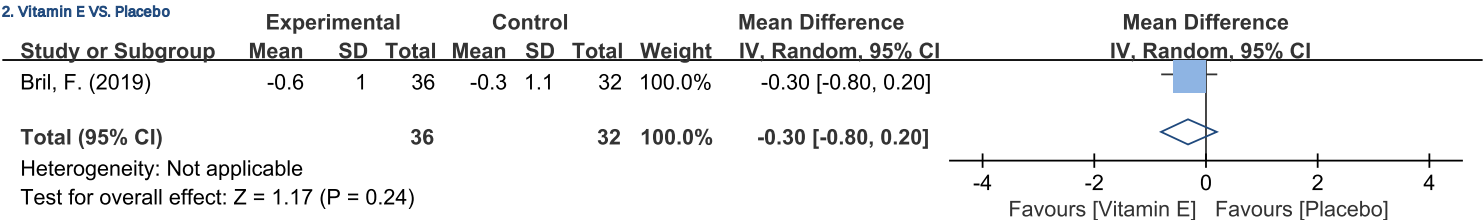


L Fibrosis

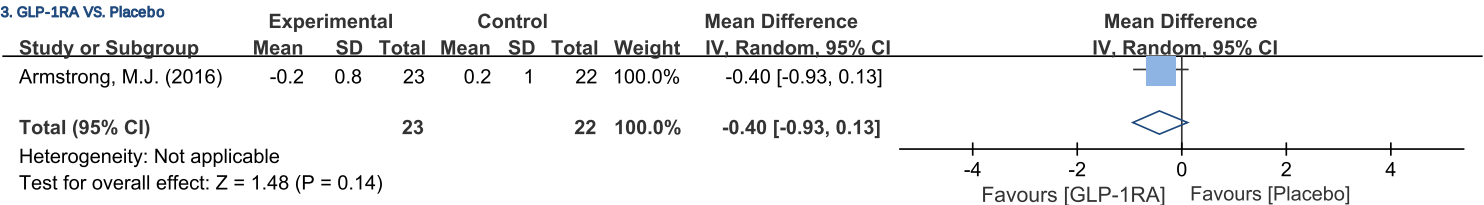
1. Thiazolidinediones VS. Placebo



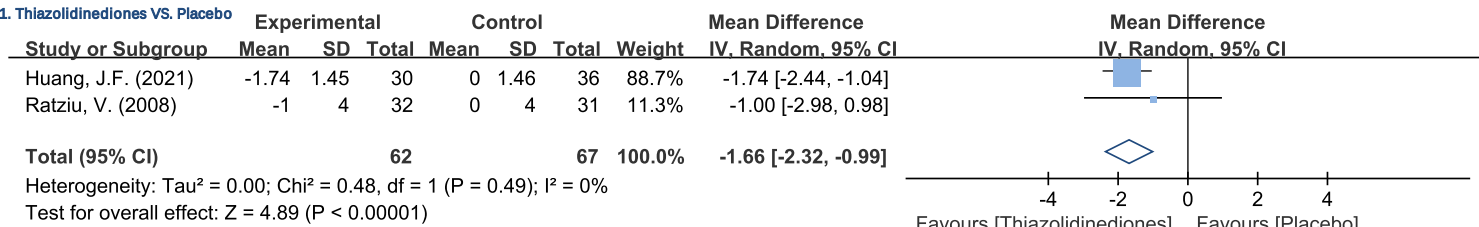
2. Vitamin E VS. Placebo



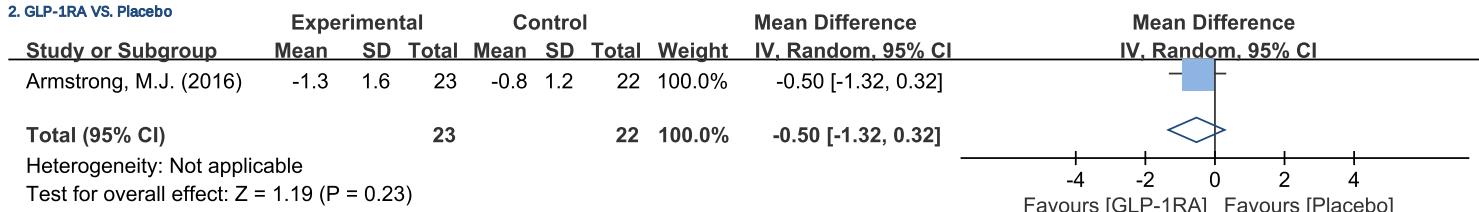
3. GLP-1RA VS. Placebo



1. Thiazolidinediones VS. Placebo

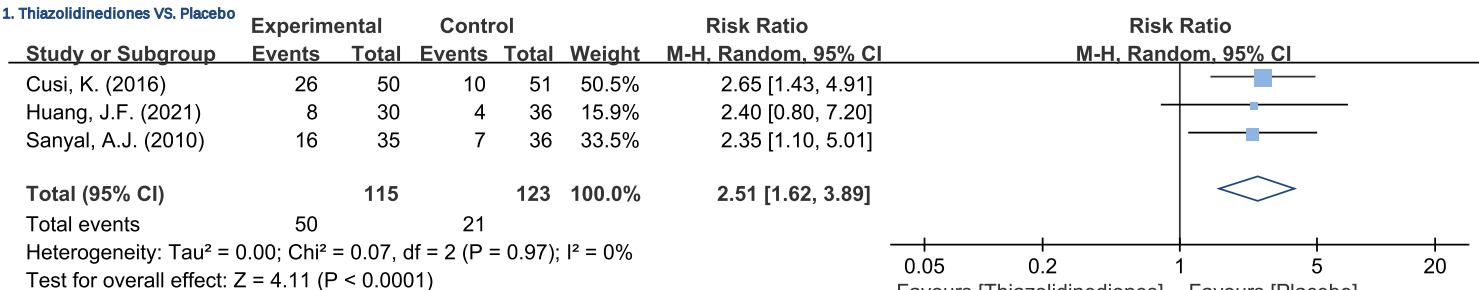


2. GLP-1RA VS. Placebo

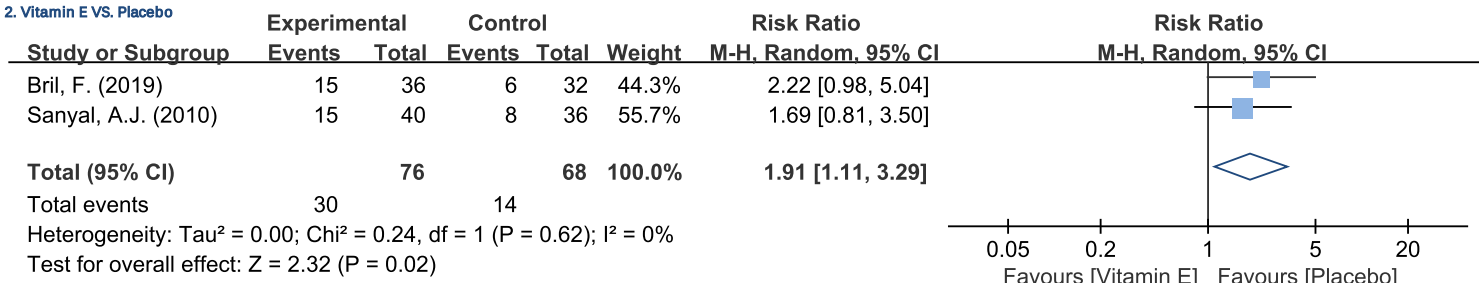


N Resolution of NASH

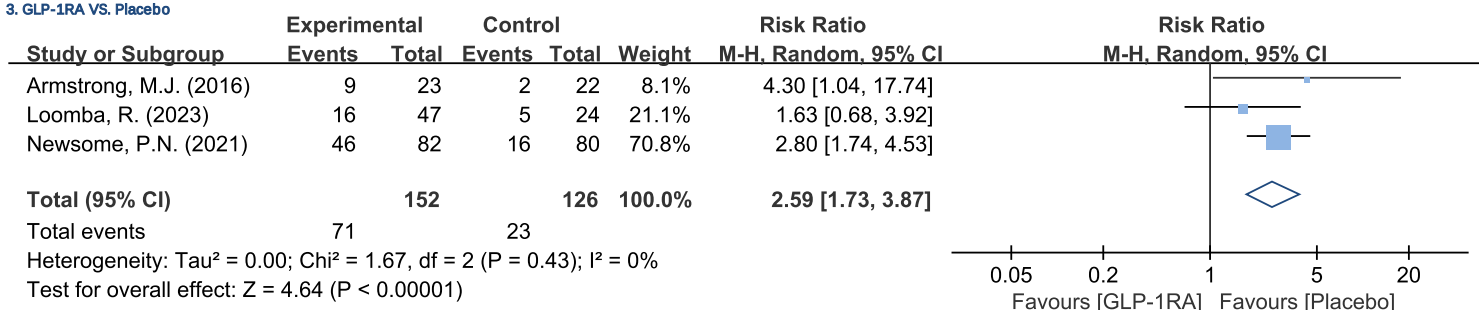
1. Thiazolidinediones VS. Placebo



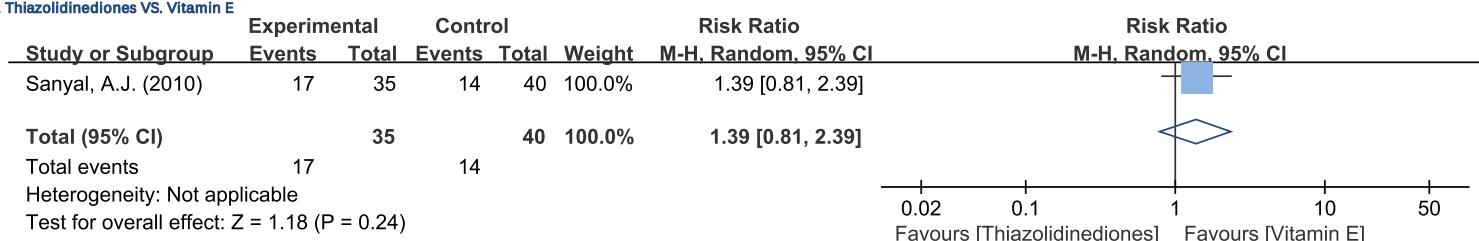
2. Vitamin E VS. Placebo



3. GLP-1RA VS. Placebo

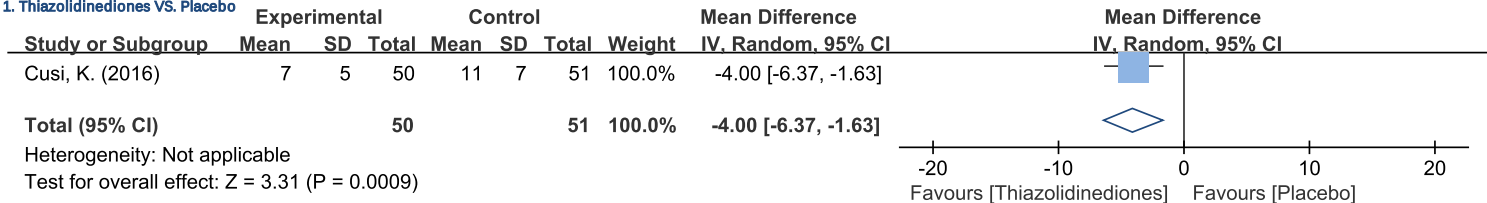


4. Thiazolidinediones VS. Vitamin E

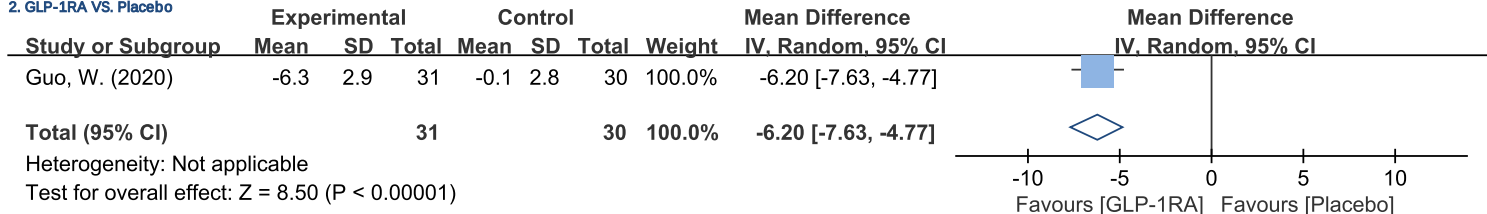


Hepatic fat content (H-MRS)

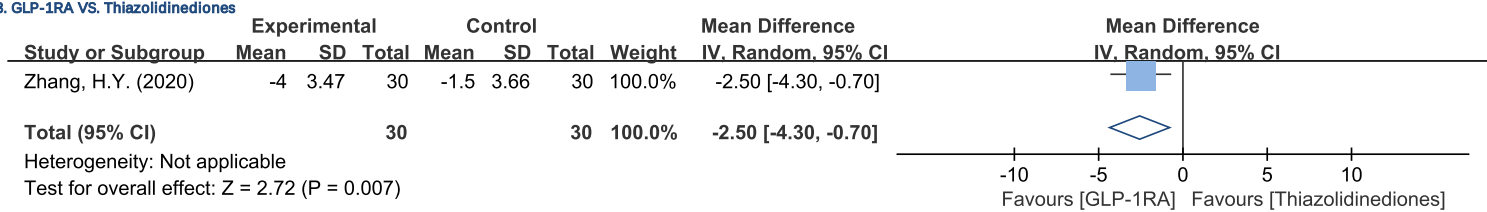
1. Thiazolidinediones VS. Placebo



2. GLP-1RA VS. Placebo

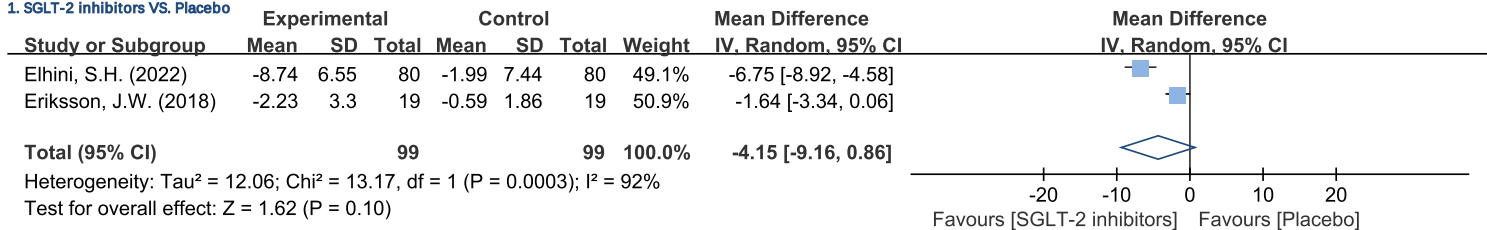


3. GLP-1RA VS. Thiazolidinediones

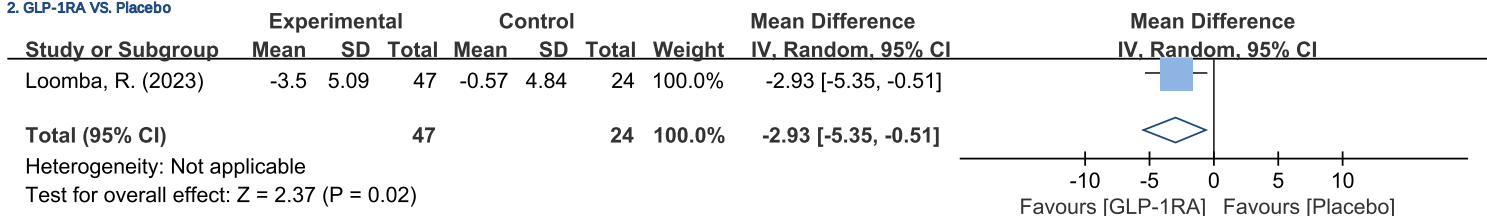


Hepatic fat content (PDF)

1. SGLT-2 inhibitors VS. Placebo



2. GLP-1RA VS. Placebo



3. Thiazolidinediones VS. Placebo

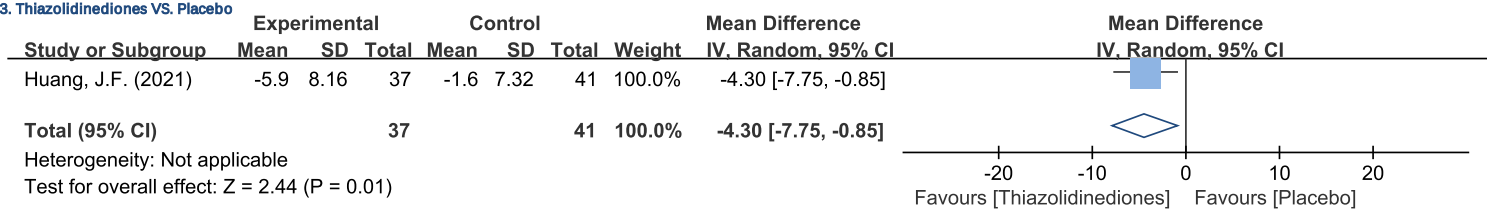
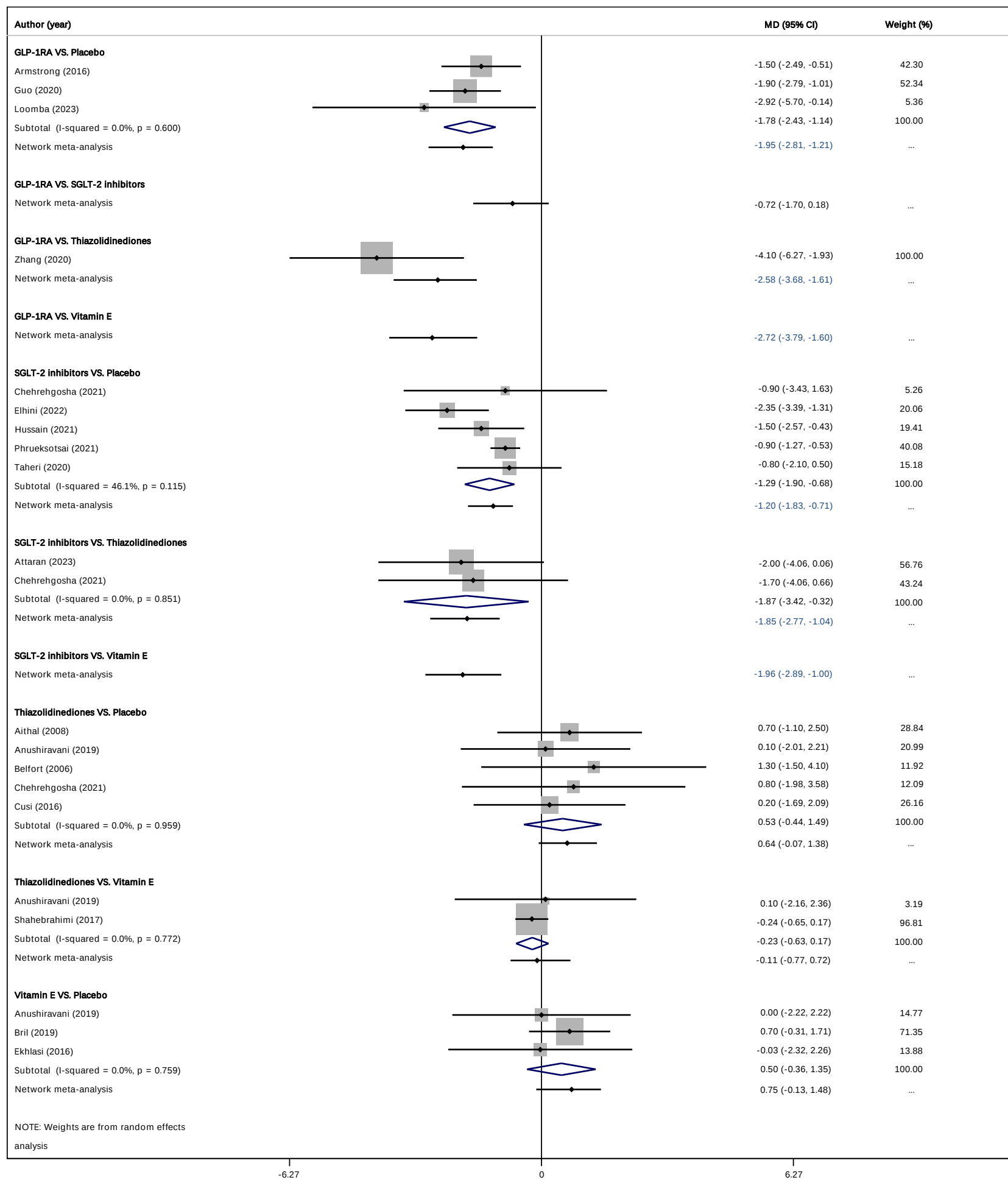
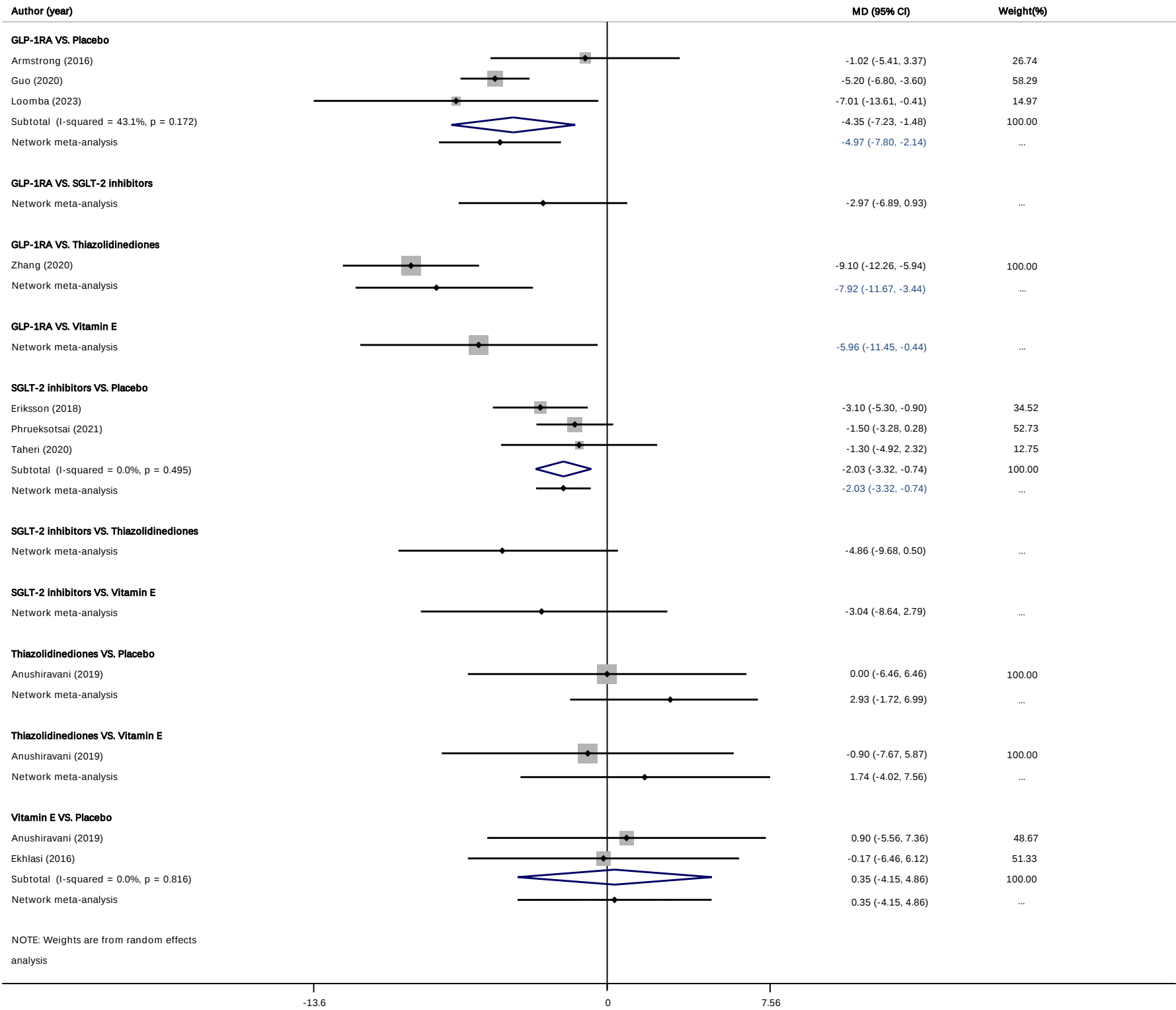
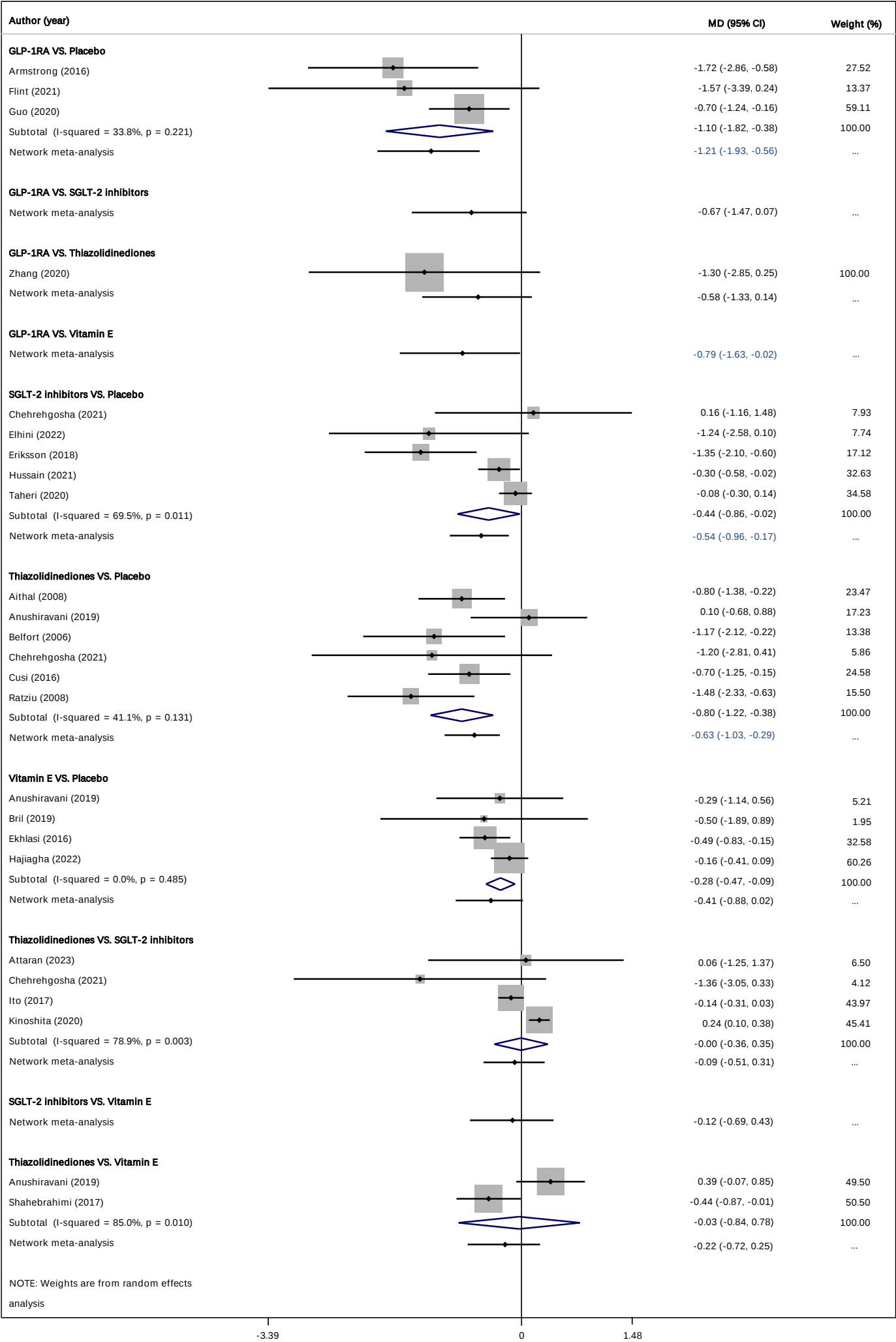
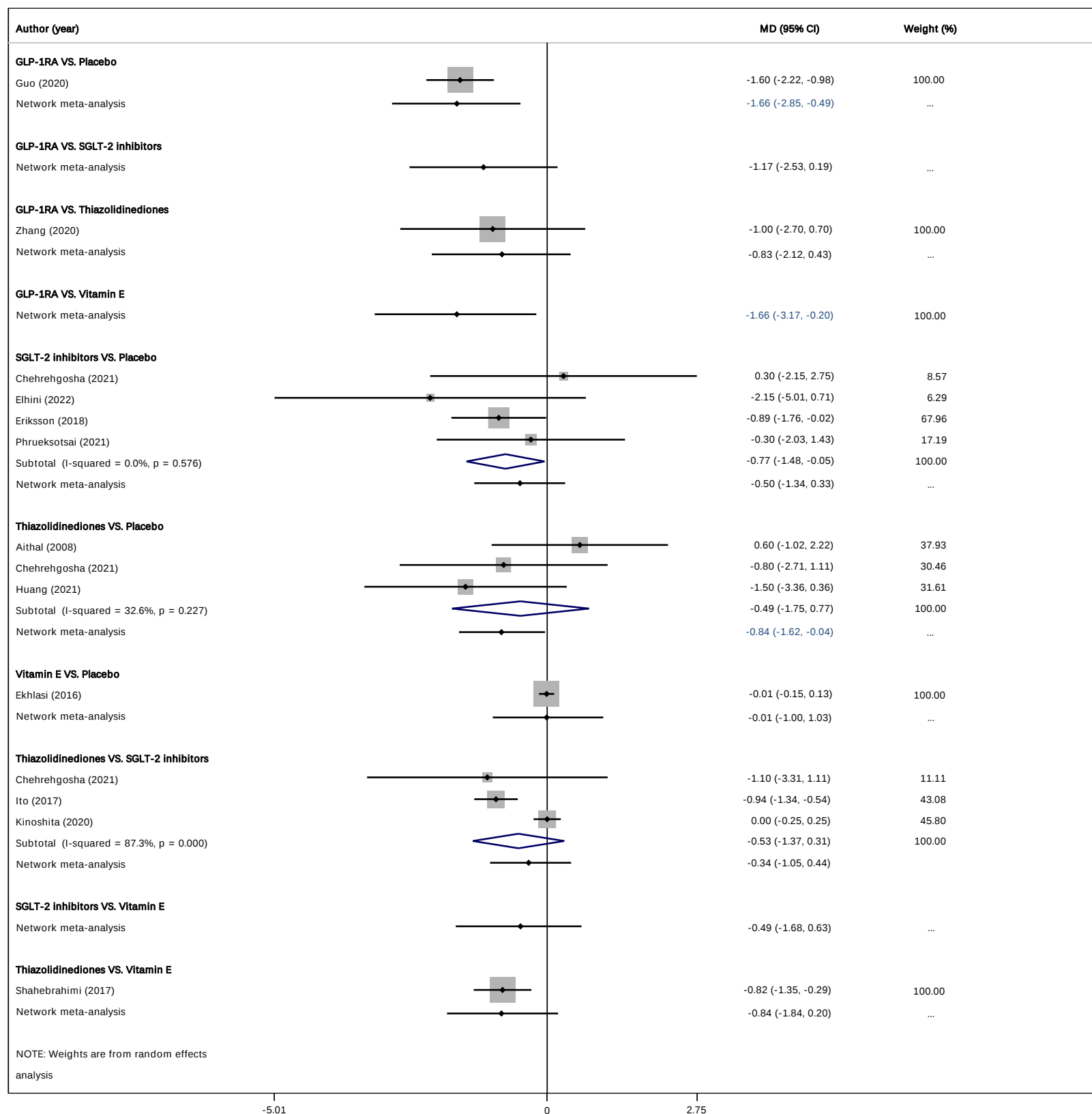


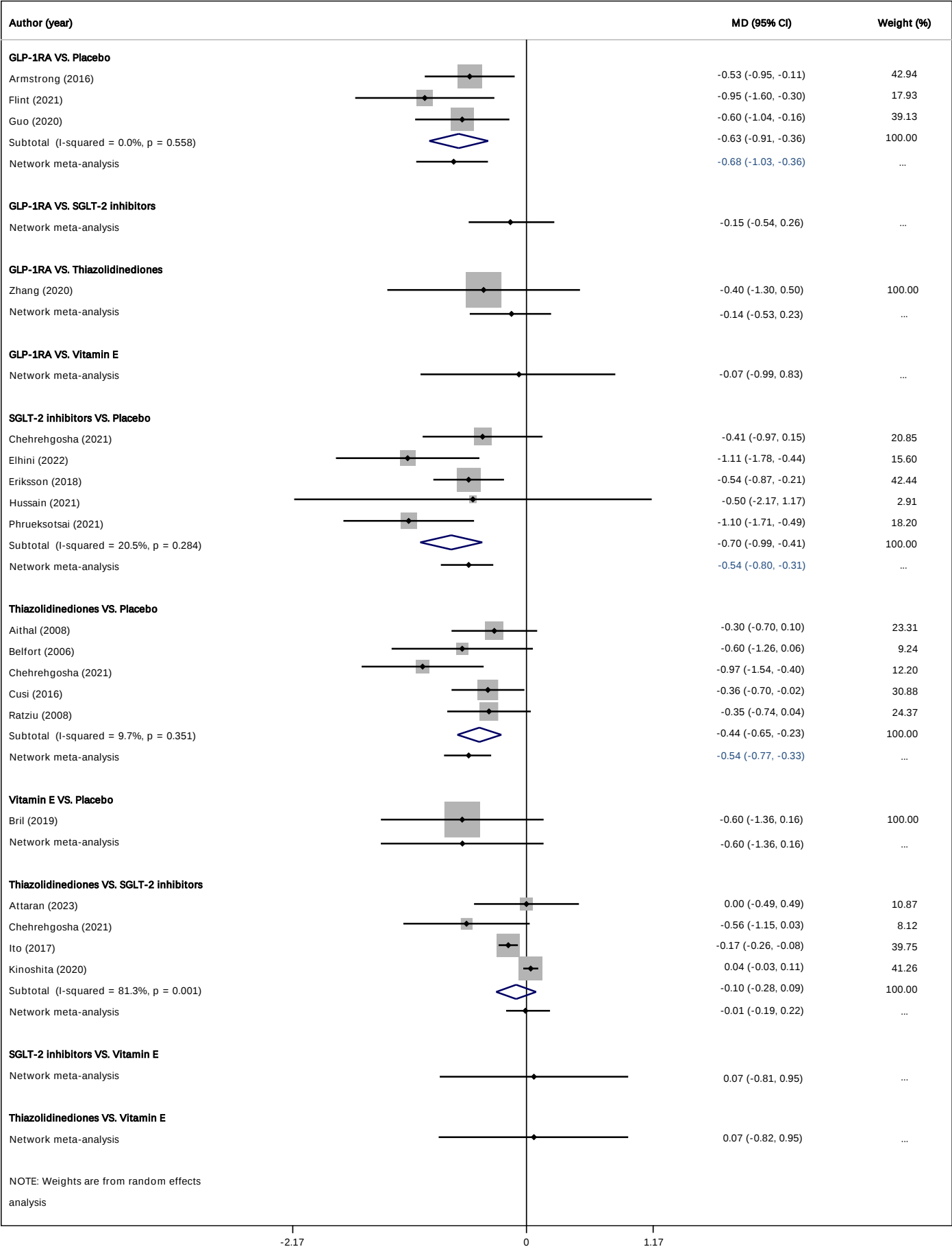
Figure S4 Forest plots - network estimate

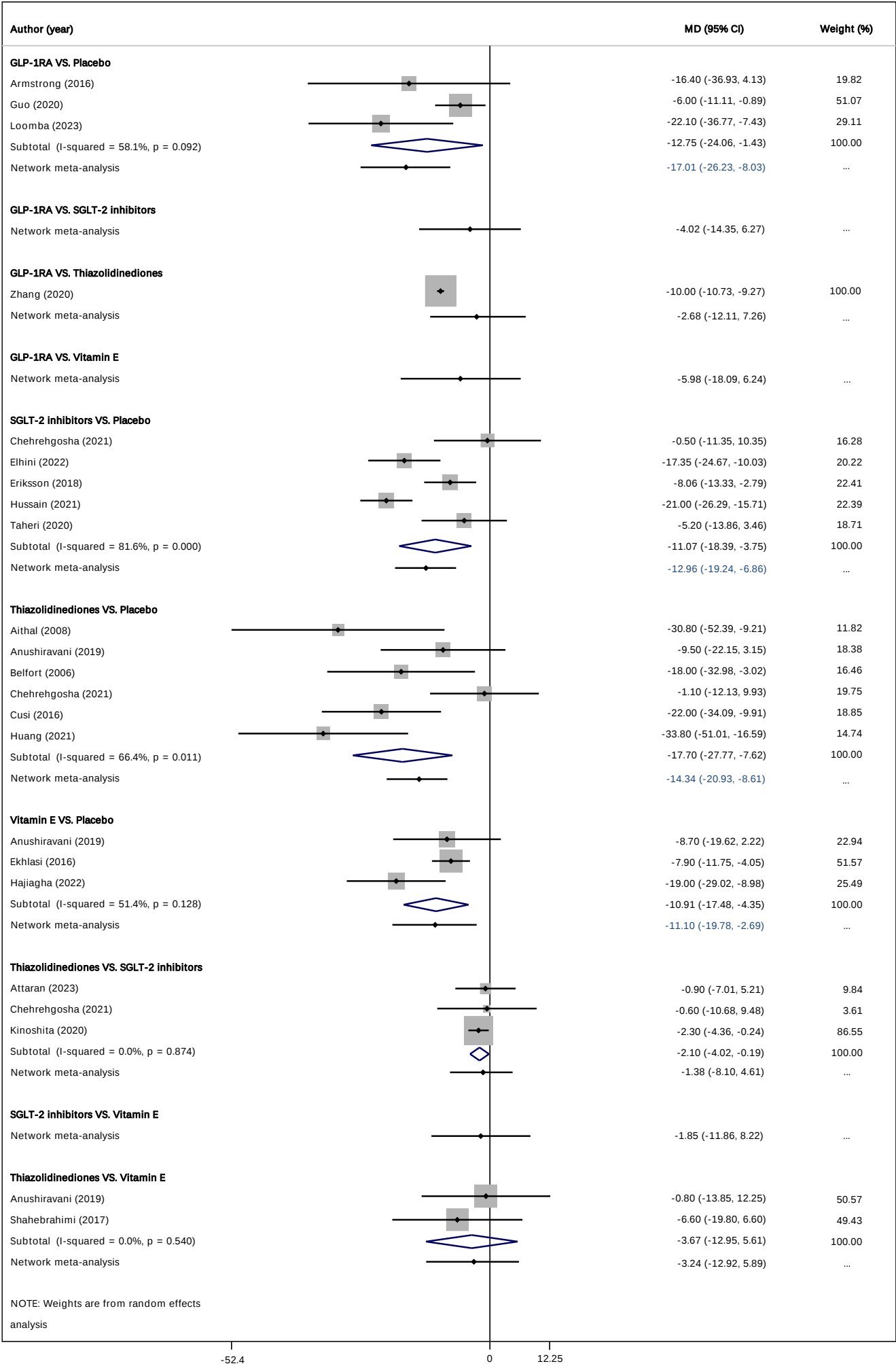


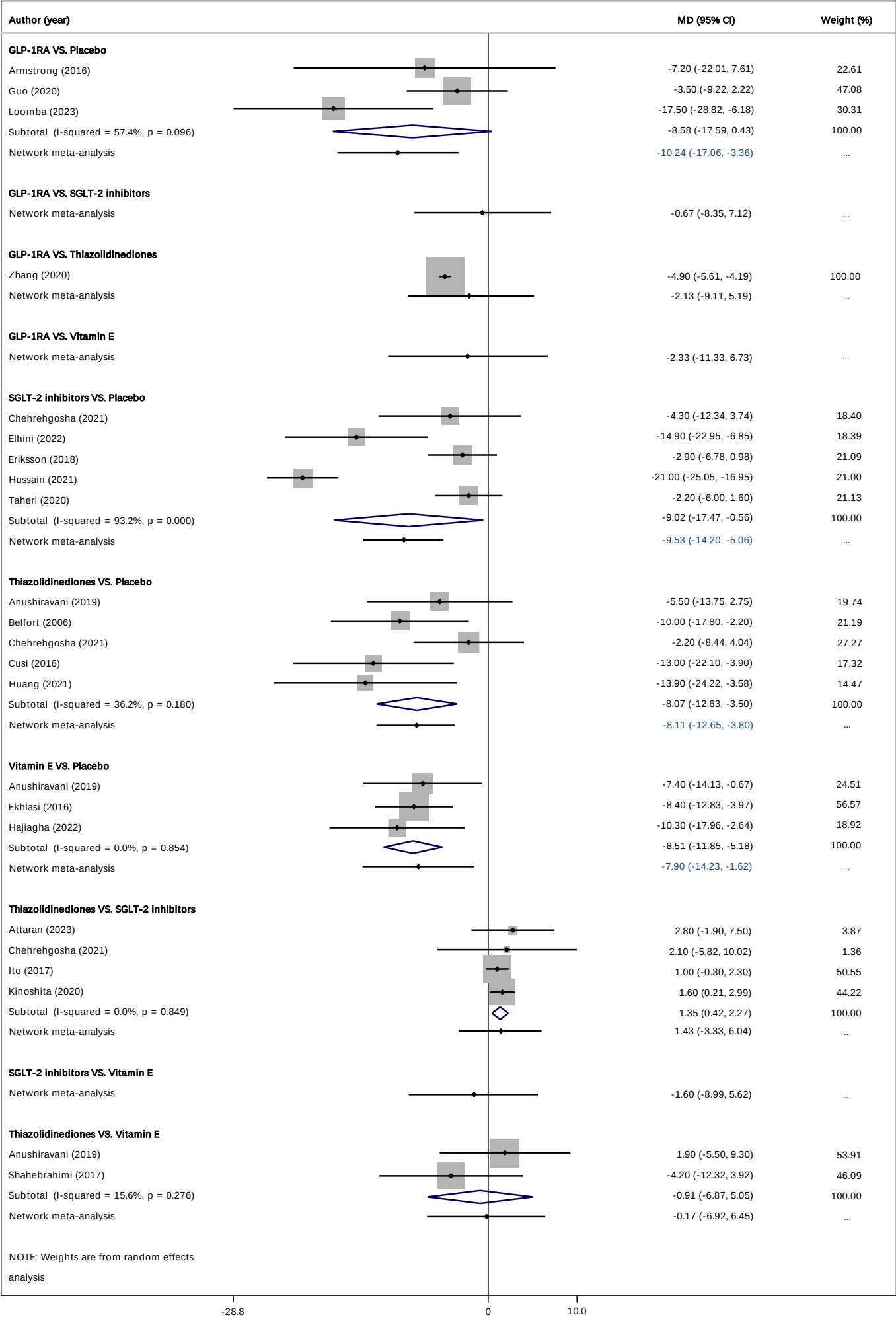


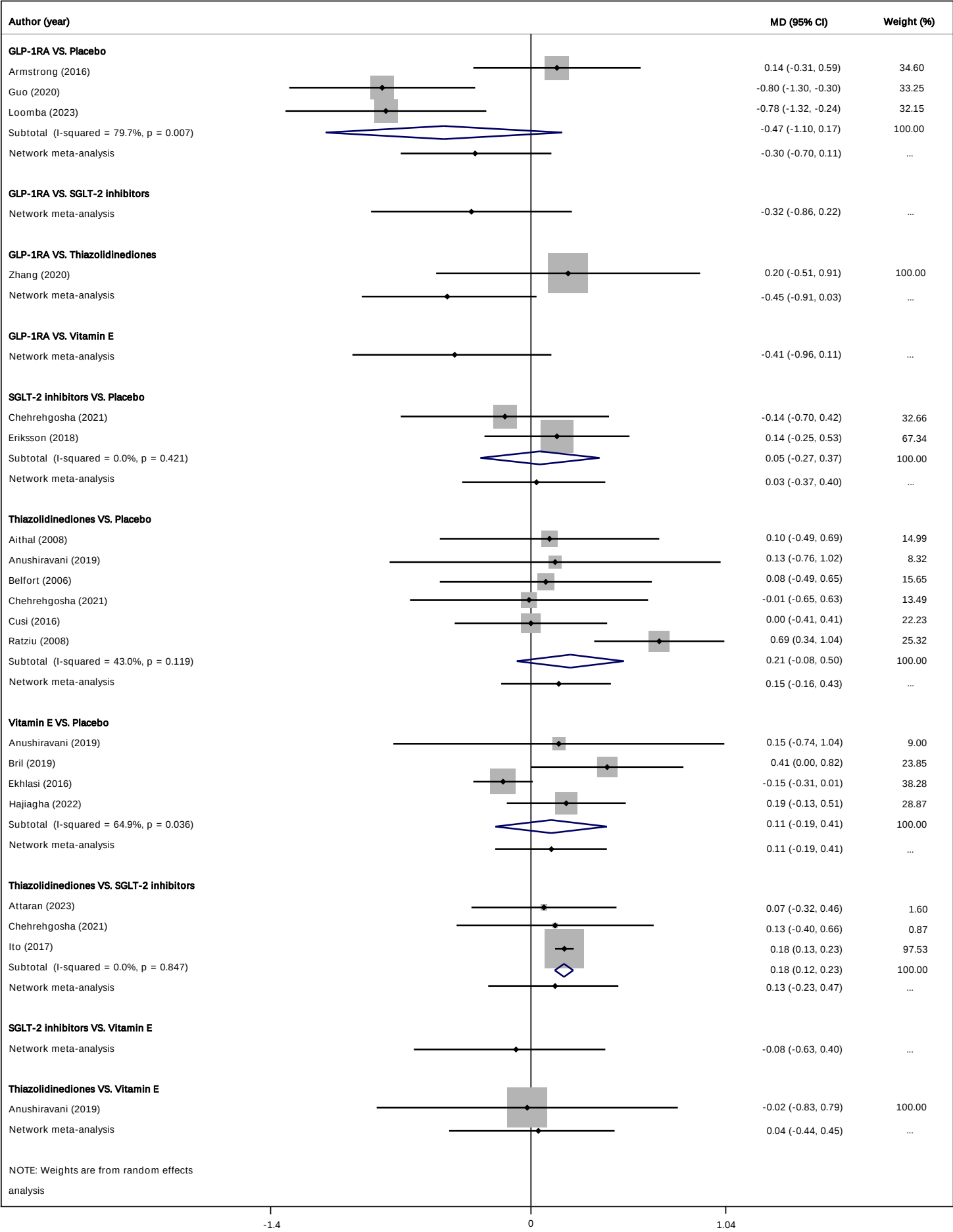


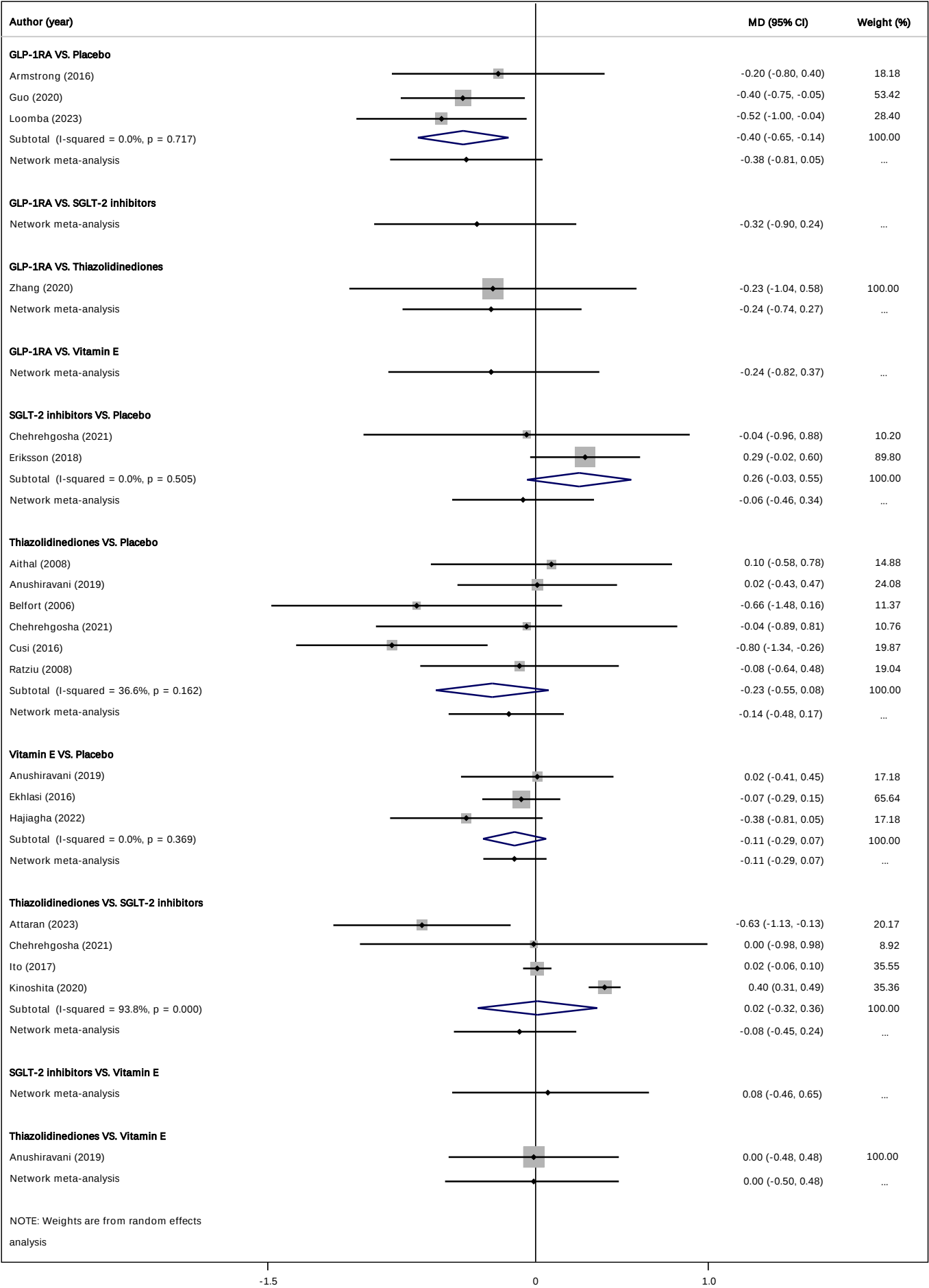


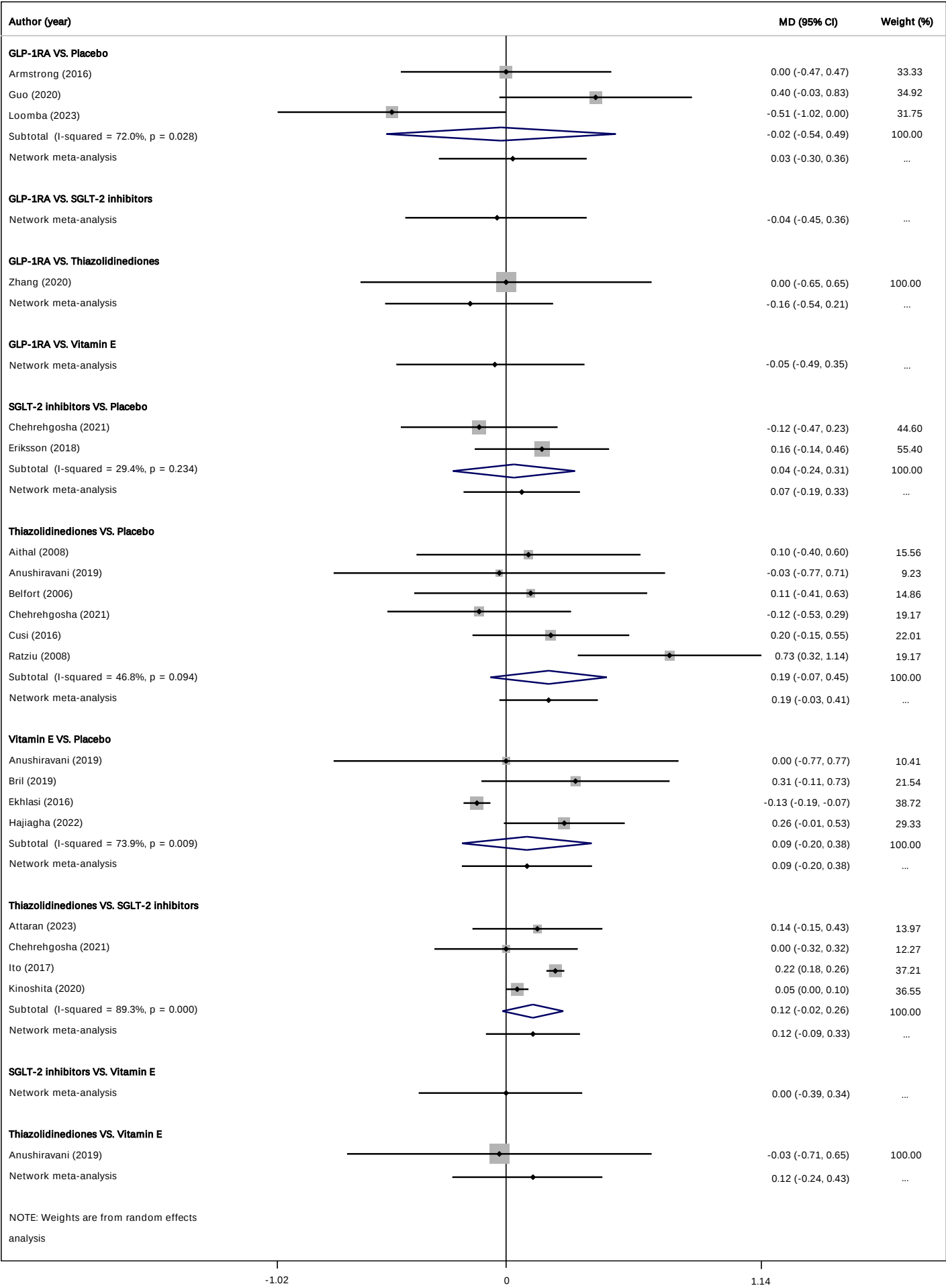


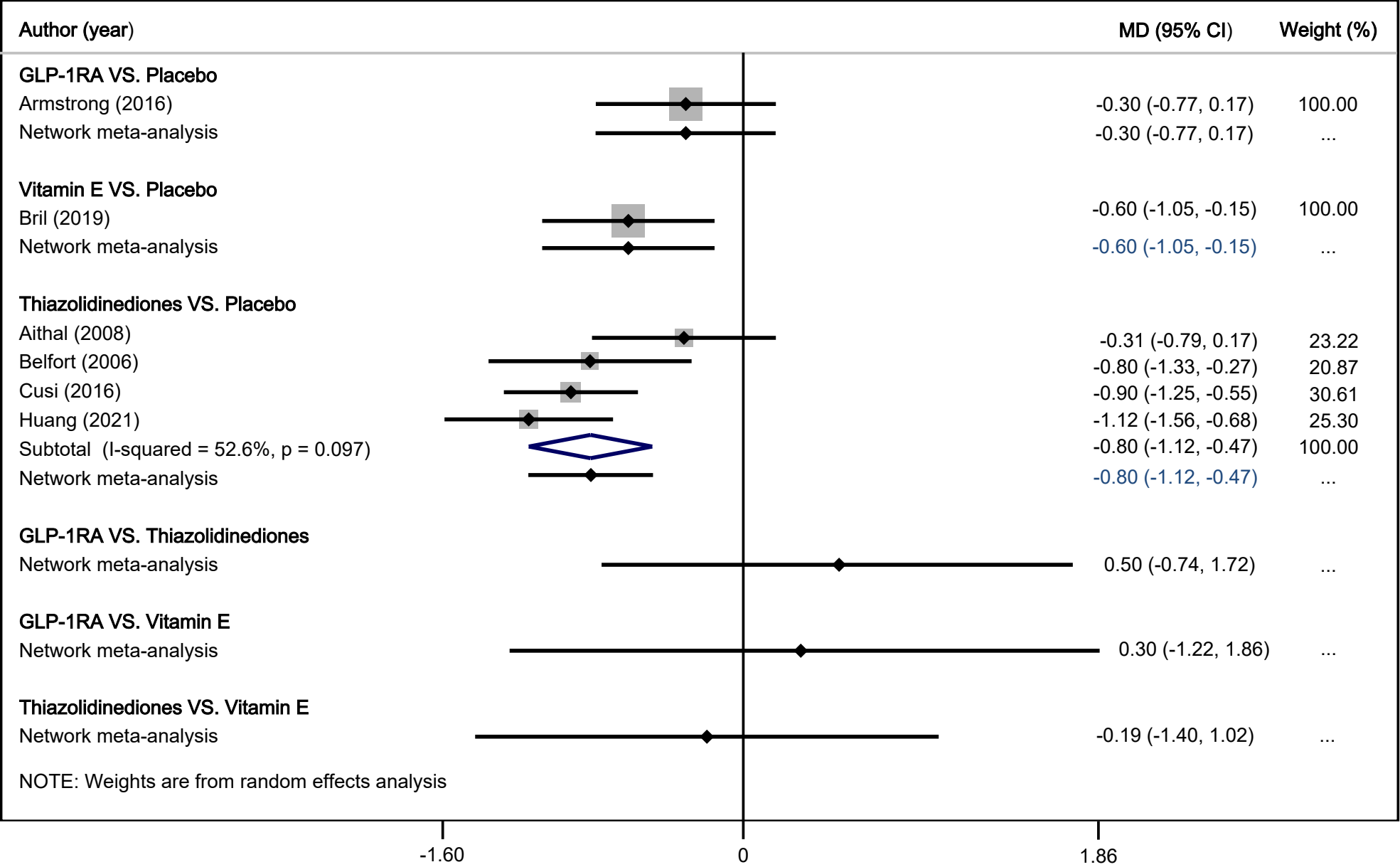


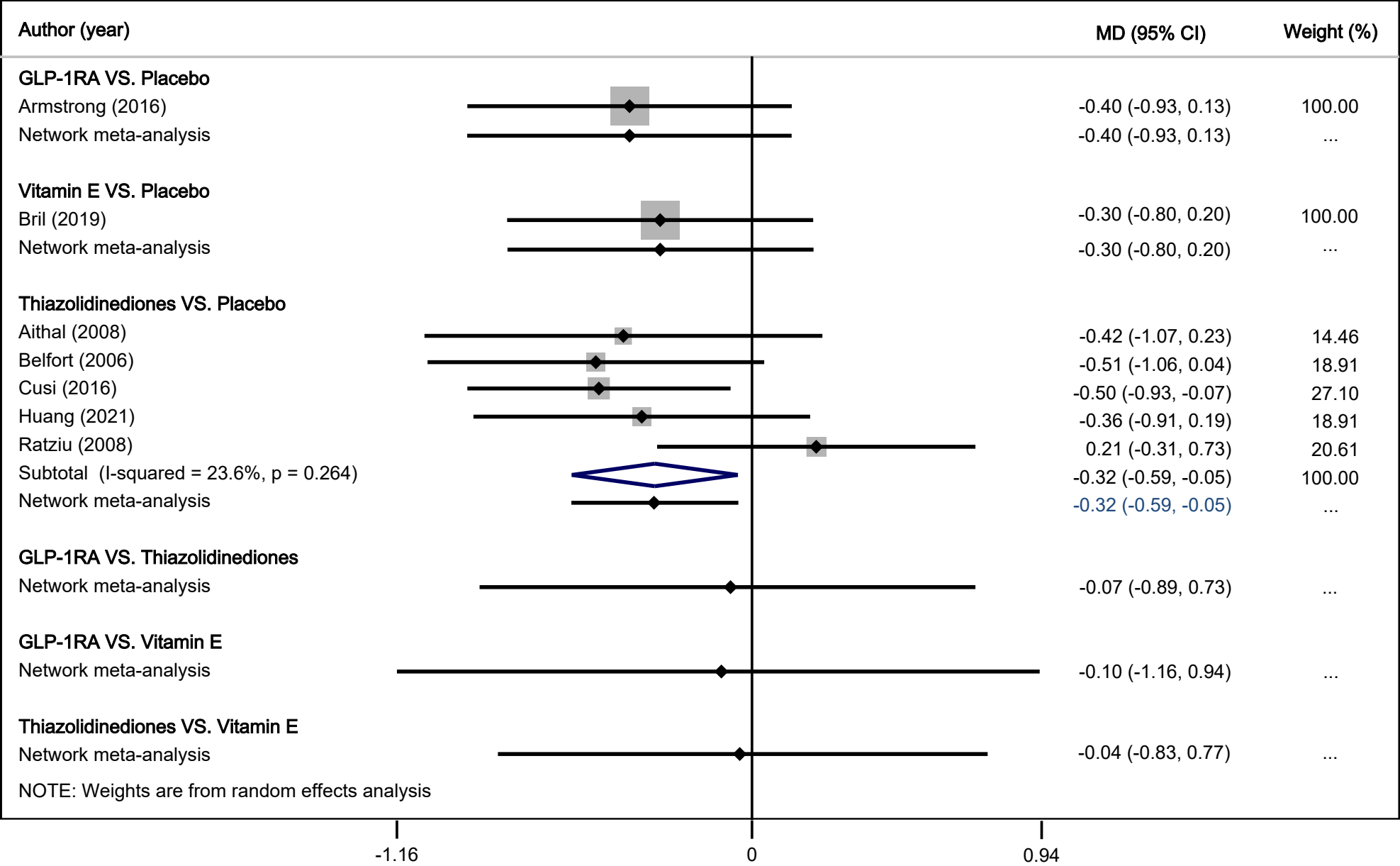


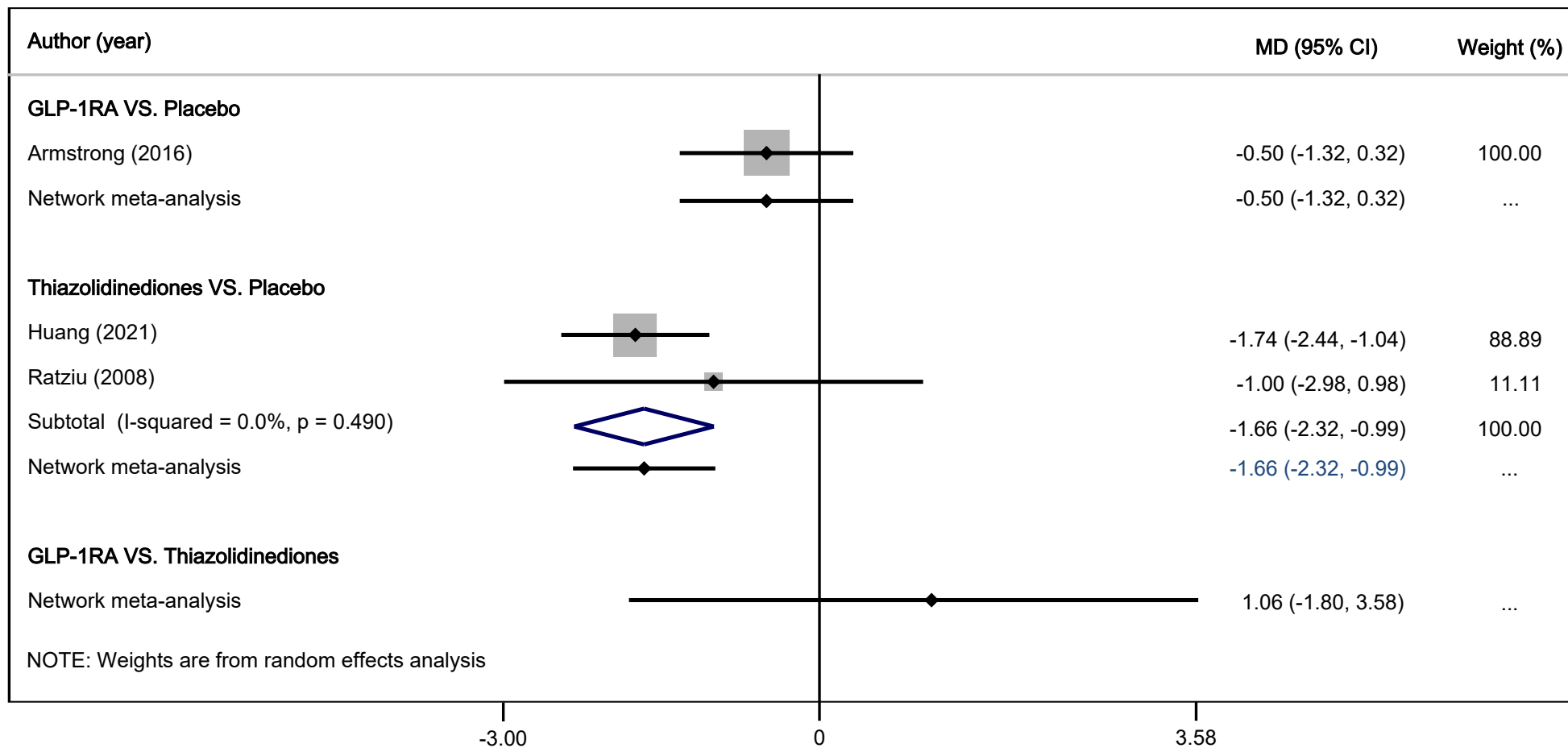


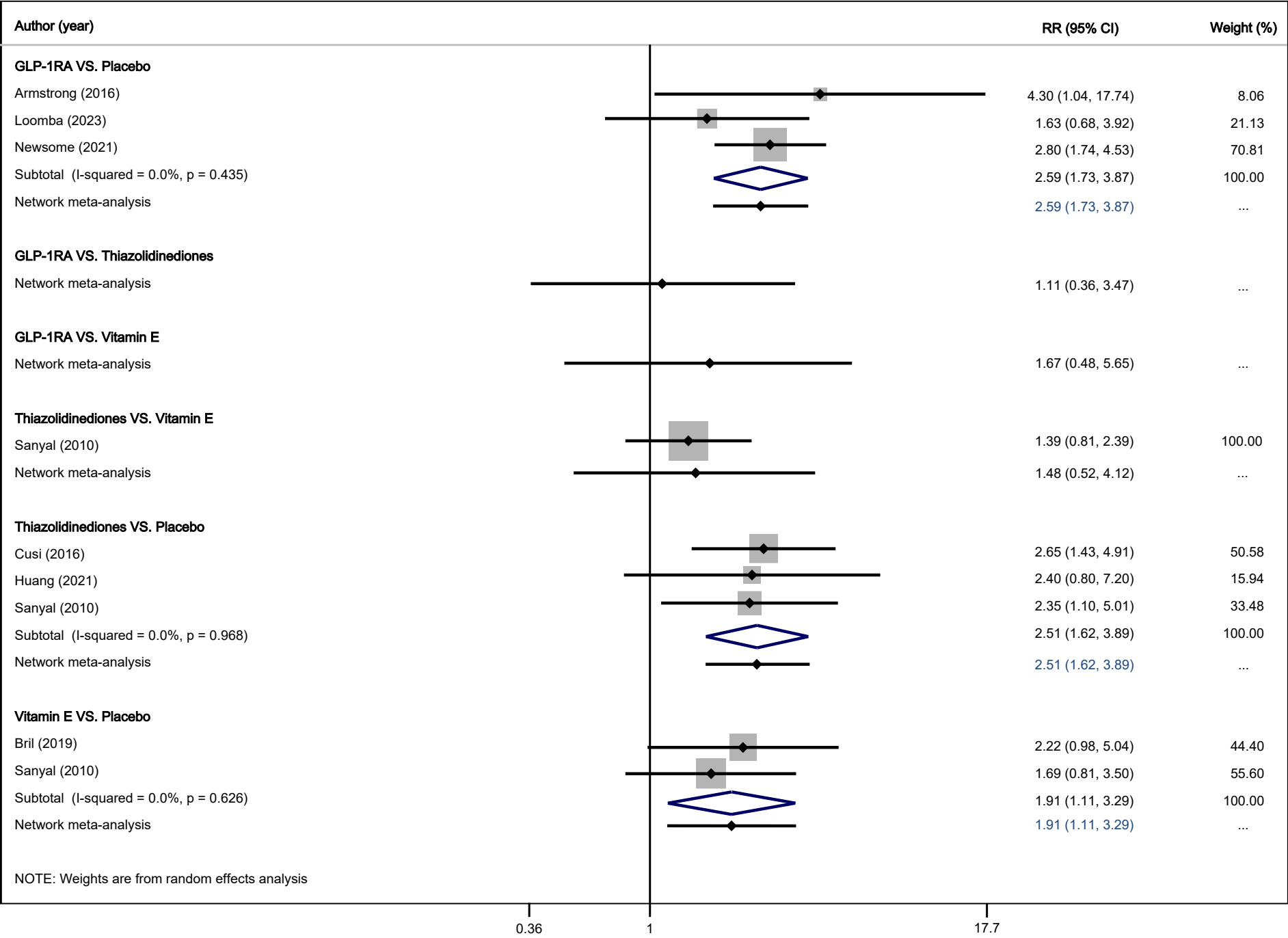


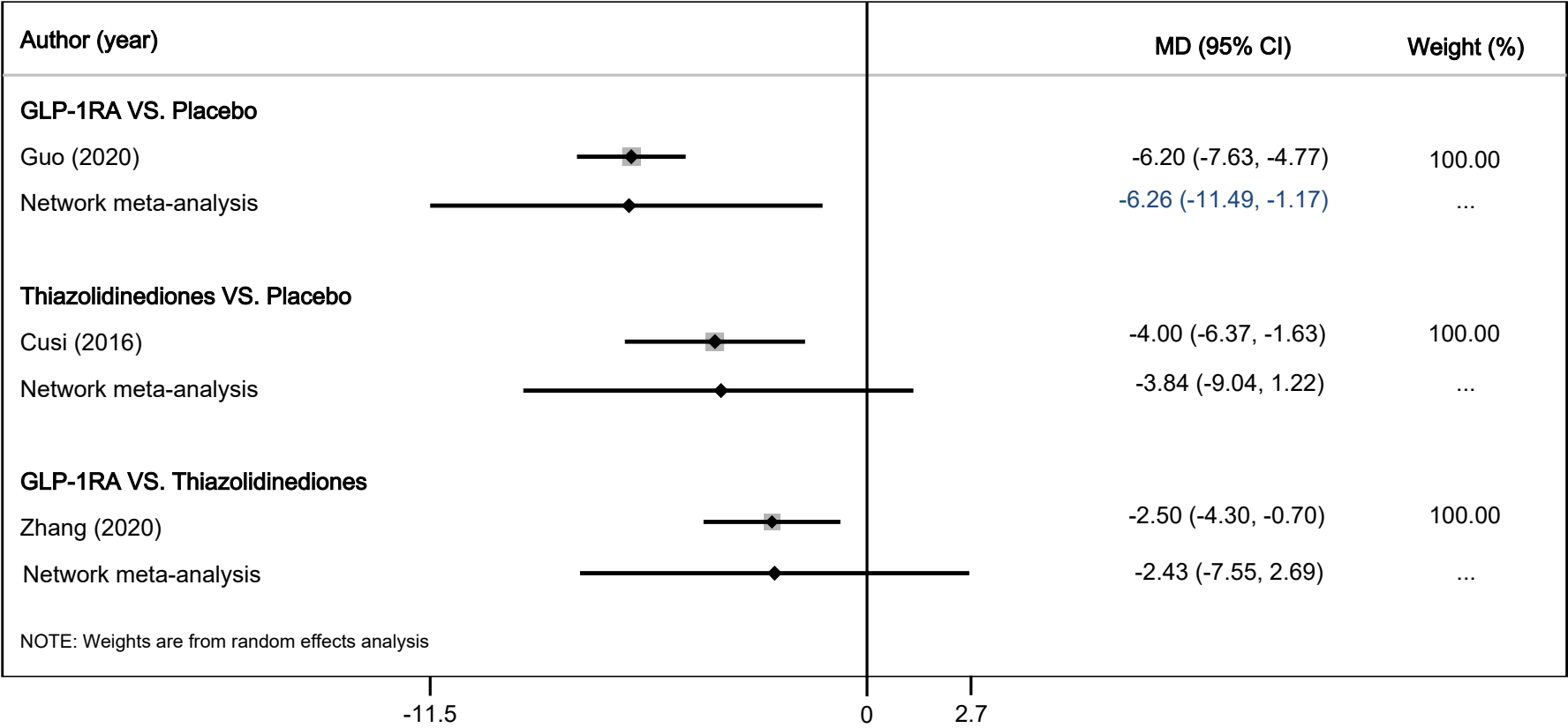












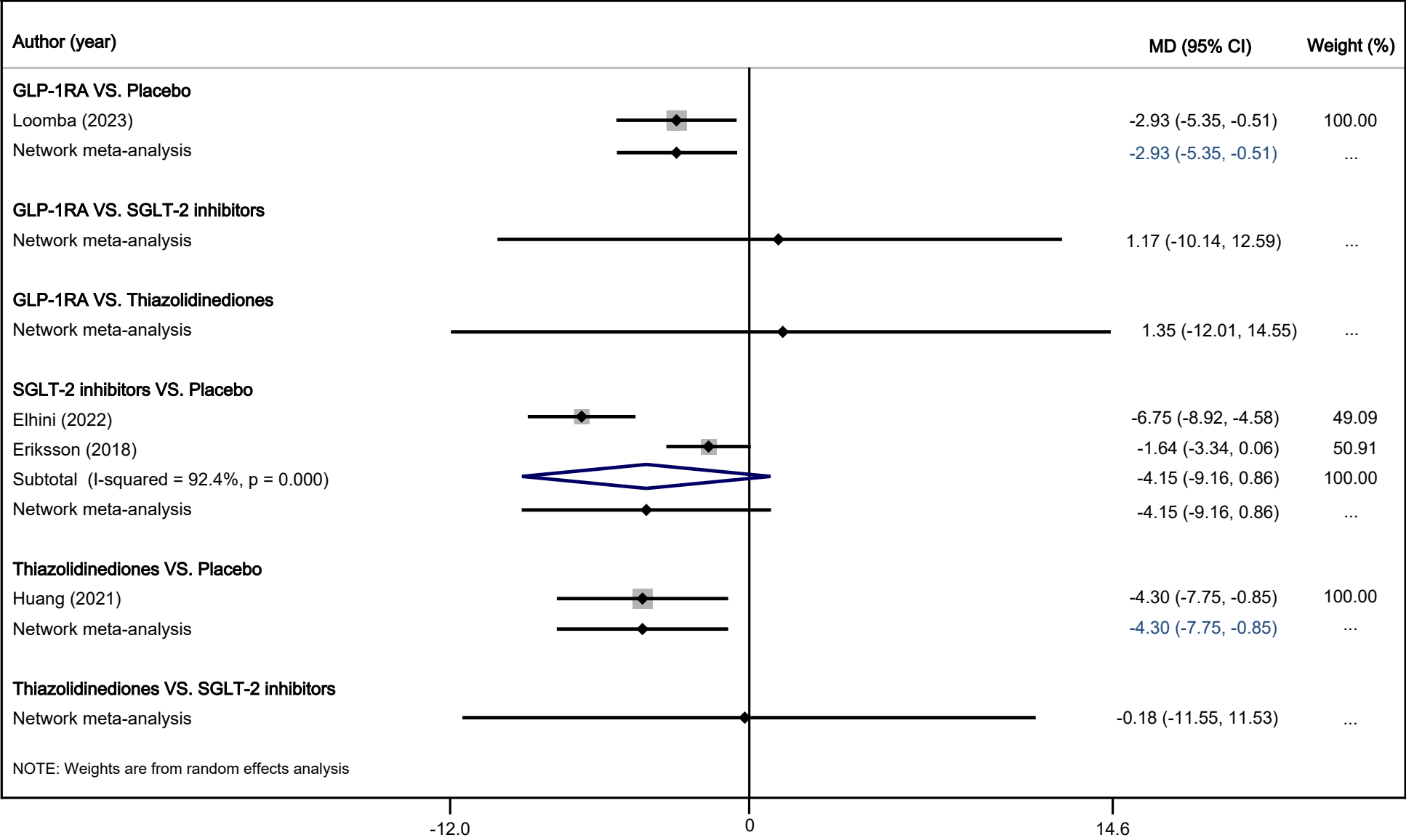
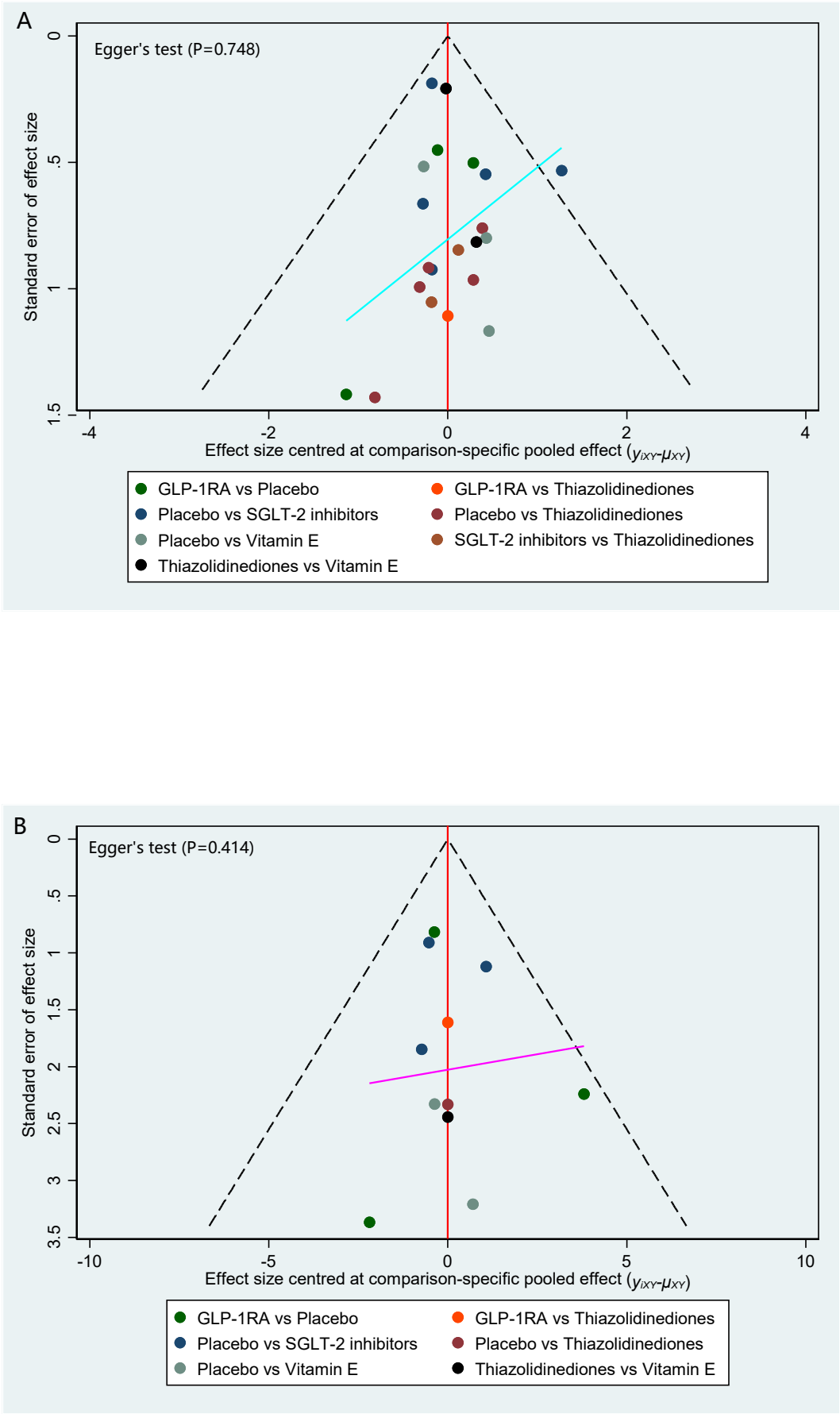
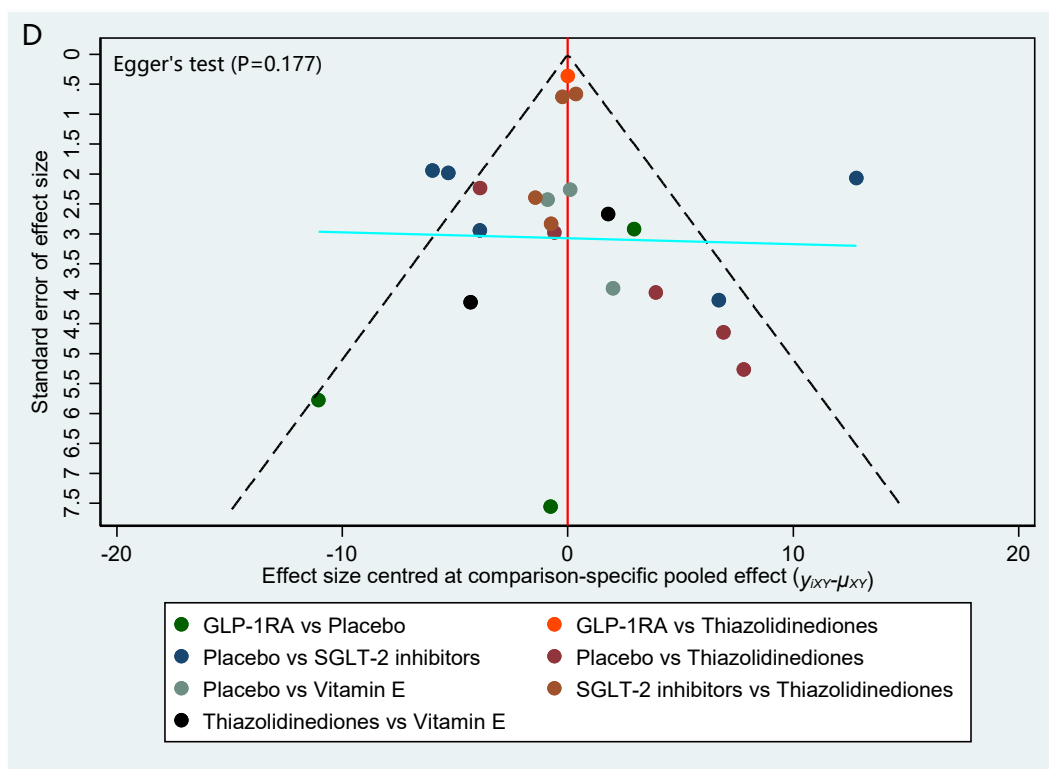
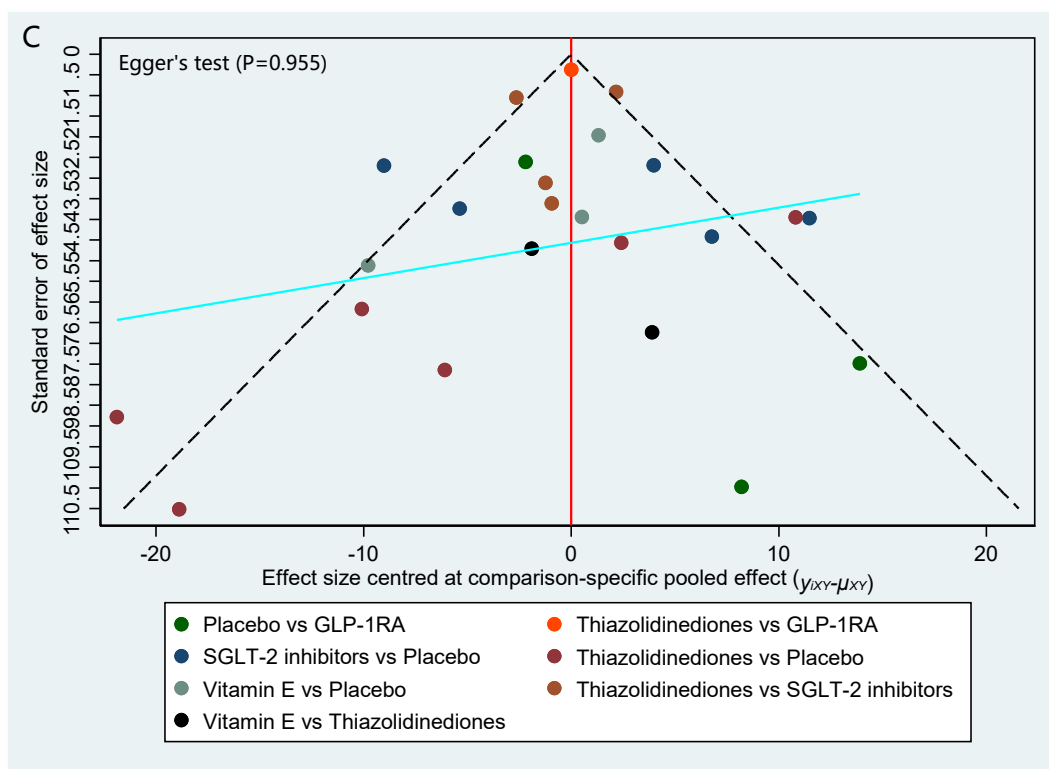
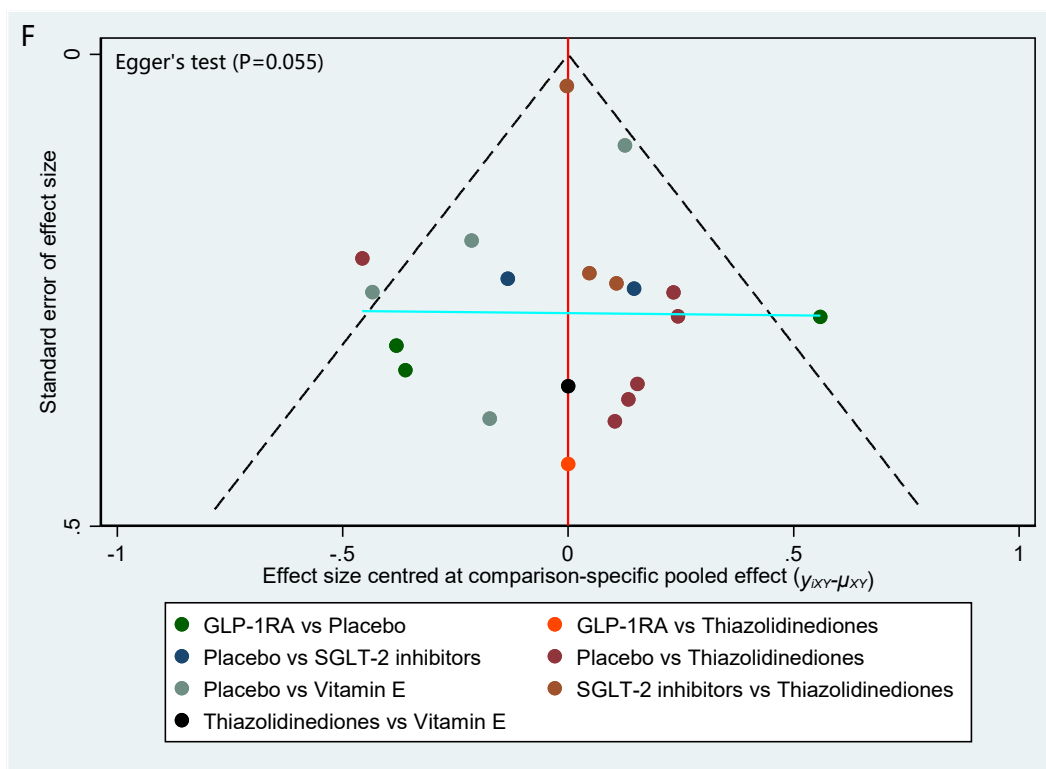
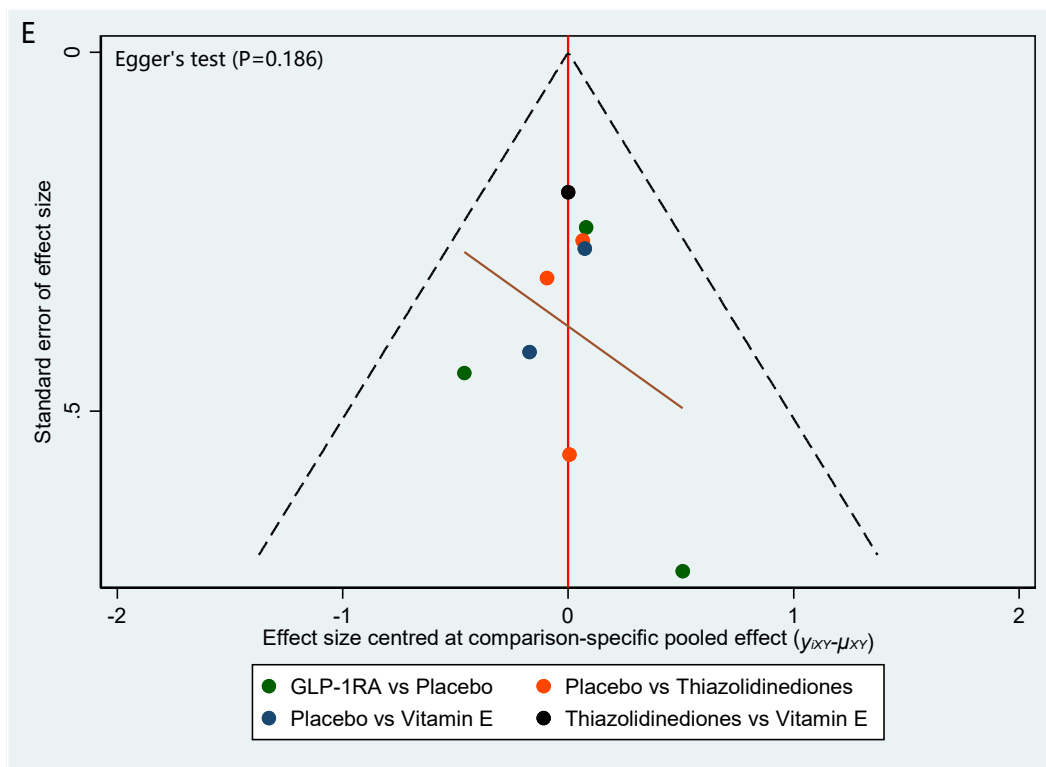
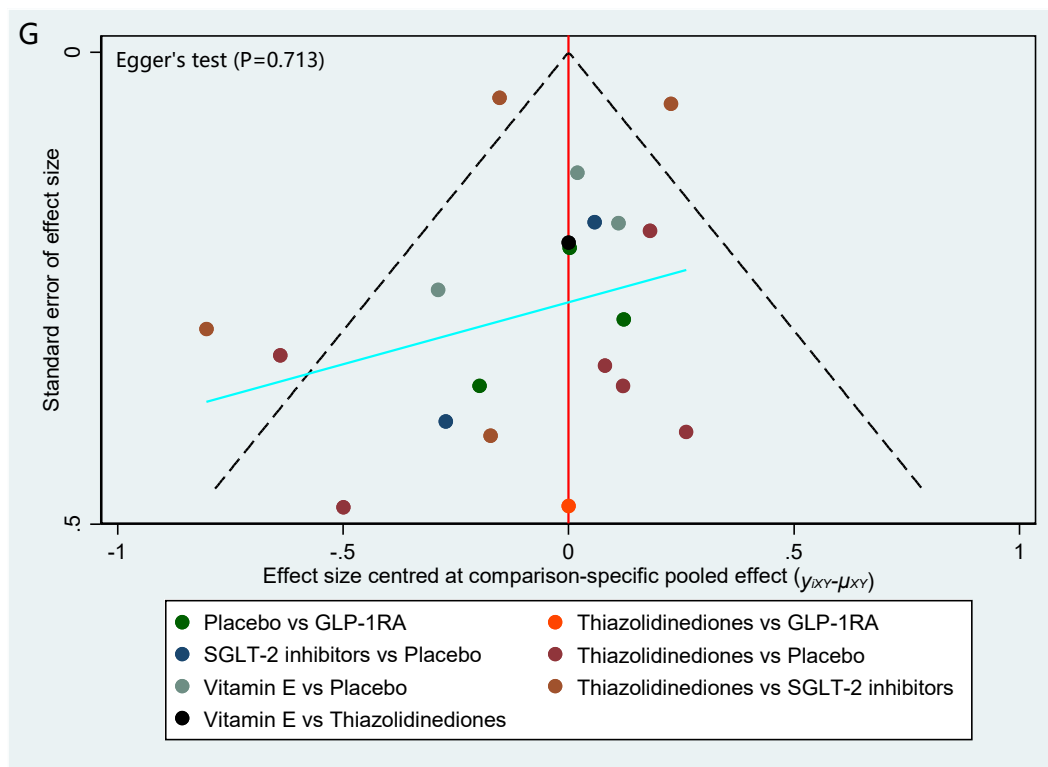


Figure S5 Comparison-adjusted funnel plots and Egger's test









Funnel plots and egger's test for main outcomes. The all results did not show significant publication bias.
 A. BMI; B. WC; C. ALT; D. AST; E. Resolution of NASH; F. TC; G. TG.