Electronic Supplementary Material (ESI) for Food & Function.

Effects of low FODMAPs diet on the symptoms management of patients with irritable bowel syndrome: An umbrella systematic review with meta-analysis of clinical trials

Supplementary data including 18 Tables and 2 Figures

The following databases were searched:

- PubMed/Medline
- Scopus
- ISI Web of Science

Table S1. Search strategies including the key terms and the queries for each database.

1.Pubmed

	(“FODMAP*” [Title/Abstract] OR “fermentable oligosaccharides, disaccharides, monosaccharides and polyols” [Title/Abstract] OR saccharides [Mesh terms] OR saccharides [Title/Abstract] OR oligosaccharide [Mesh terms] OR oligosaccharide [Title/Abstract] OR disaccharide [Mesh terms] OR disaccharide [Title/Abstract] OR monosaccharide [Mesh terms] OR monosaccharide [Title/Abstract] OR polyol*[Title/Abstract] OR galactic-oligosaccharides [Title/Abstract] OR fructans [Mesh terms] OR fructi* [Title/Abstract] OR fructose [Mesh terms] OR fructose [Title/Abstract] OR galactans [Mesh terms] OR galactans [Title/Abstract] OR lactose [Mesh terms] OR lactose [Title/Abstract] OR sorbitol [Mesh terms] OR sorbitol[Title/Abstract] OR manitol [Title/Abstract] OR xylitol [Mesh terms] OR xylitol [Title/Abstract] OR manitol [Mesh terms] OR sweetener [Mesh terms] OR sweetener*[Title/Abstract] OR sweeteners [Mesh terms] OR sweetening agent [Mesh terms] OR "Fermentable Oligo-, Di-, Mono-saccharides And Polyols" [Title/Abstract] OR “low FODMAP diet” [Title/Abstract] OR short-chain carbohydrate [Title/Abstract] OR oligo-saccharide[Title/Abstract] OR di-saccharide[Title/Abstract] OR mono-saccharide [Title/Abstract] OR “fructooligosaccharide” [Title/Abstract] OR “fructo-oligosaccharide” [Title/Abstract] OR galactooligosaccharide [Title/Abstract] “galacto-oligosaccharide” [Title/Abstract] OR “Sugar Alcohols”[Mesh terms] OR “Sugar)
AND	
	(“Irritable Bowel Syndrome “[Mesh terms] OR “Irritable Bowel Syndrome” [Title/Abstract] OR “Irritable Colon” [Title/Abstract] OR “Mucous Colitis” [Title/Abstract] OR “IBS” [Title/Abstract] OR “irritable bowel”[Title/Abstract] OR “functional gastrointestinal”[Title/Abstract] OR “functional bowel” [Title/Abstract] OR “spastic colon”[Title/Abstract] OR “Colonic Diseases, Functional” [Mesh terms])
AND	
	("systematic review" [Title/Abstract] OR "meta-analysis"[Title/Abstract] OR “review” [Title/Abstract])
2.Scopus	
	TITLE-ABS (“FODMAP*”) OR TITLE-ABS (“fermentable oligosaccharides, disaccharides, monosaccharides and polyols”) OR TITLE-ABS (saccharides) OR TITLE-ABS (oligosaccharide) OR TITLE-ABS (disaccharide) OR TITLE-ABS (monosaccharide) OR TITLE-ABS (polyol*) OR TITLE-ABS (galacto-oligosaccharides) OR TITLE-ABS (fructan*) OR TITLE-ABS (fructose) OR TITLE-ABS (galactans) OR TITLE-ABS (lactose) OR TITLE-ABS (sorbitol) OR TITLE-ABS (mannitol) OR TITLE-ABS (xylitol) OR TITLE-ABS (manitol) OR TITLE-ABS (sweetener*) OR TITLE-ABS ("Fermentable Oligo-, Di-, Mono-saccharides And Polyols") OR TITLE-ABS (“low FODMAP diet”) OR TITLE-ABS (short-chain carbohydrate) OR TITLE-ABS (oligo-saccharide) OR TITLE-ABS (di-saccharide) OR TITLE-ABS (mono-saccharide) OR TITLE-ABS (“fructooligosaccharide”) OR TITLE-ABS (“fructo-oligosaccharide”) OR TITLE-ABS (galactooligosaccharide) OR TITLE-ABS (“galacto-oligosaccharide”) OR TITLE-ABS (“Sugar Alcohols”)
AND	
	TITLE-ABS (“irritable bowel syndrome”) OR TITLE-ABS (“Irritable Colon”) OR TITLE-ABS (“Mucous Colitis”) OR TITLE-ABS (“IBS”) OR TITLE-ABS (“irritable bowel”) OR TITLE-ABS (“Colonic Functional Diseases”) OR TITLE-ABS (“functional gastrointestinal”) OR TITLE-ABS (“functional bowel”) OR TITLE-ABS (“spastic colon”)
AND	

TITLE-ABS ("systematic review") OR TITLE-ABS (meta-analysis) OR TITLE-ABS (review)

3. ISI WOS

TI=(“FODMAP*”) OR TI=(“fermentable oligosaccharides, disaccharides, monosaccharides and polyols”) OR TI=(saccharides) OR TI=(oligosaccharide) OR TI=(disaccharide) OR TI=(monosaccharide) OR TI=(polyol*) OR TI=(galacto-oligosaccharides) OR TI=(fructan*) OR TI=(fructose) OR TI=(galactans) OR TI=(lactose) OR TI=(sorbitol) OR TI=(mannitol) OR TI=(xylitol) OR TI=(manitol) OR TI=(sweetener*) OR TI=("Fermentable Oligo-, Di-, Mono-saccharides And Polyols") OR TI=(“low FODMAP diet”) OR TI=(short-chain carbohydrate) OR TI=(oligo-saccharide) OR TI=(di-saccharide) OR TI=(mono-saccharide) OR TI=(“fructooligosaccharide”) OR TI=(“fructo?oligosaccharide”) OR TI=(galactooligosaccharide) OR TI=(“galacto?oligosaccharide”) OR TI=(“Sugar Alcohols”) OR AB=(“FODMAP*”) OR AB=(“fermentable oligosaccharides, disaccharides, monosaccharides and polyols”) OR AB=(saccharides) OR AB=(oligosaccharide) OR AB=(disaccharide) OR AB=(monosaccharide) OR AB=(polyol*) OR AB=(galacto-oligosaccharides) OR AB=(fructan*) OR AB=(fructose) OR AB=(galactans) OR AB=(lactose) OR AB=(sorbitol) OR AB=(mannitol) OR AB=(xylitol) OR AB=(manitol) OR AB=(sweetener*) OR AB=("Fermentable Oligo-, Di-, Mono-saccharides And Polyols") OR AB=(“low FODMAP diet”) OR AB=(short-chain carbohydrate) OR AB=(oligo-saccharide) OR AB=(di-saccharide) OR AB=(mono-saccharide) OR AB=(“fructooligosaccharide”) OR AB=(“fructo-oligosaccharide”) OR AB=(galactooligosaccharide) OR AB=(“galacto-oligosaccharide”) OR AB=(“Sugar Alcohols”)

AND

TI=(“Irritable Bowel Syndrome”) OR TI=(“Irritable Colon”) OR TI=(“Mucous Colitis”) OR TI=(“IBS”) OR TI=(“irritable bowel”) OR TI=(“Colonic Functional Diseases”) OR TI=(“functional gastrointestinal”) OR TI=(“functional bowel”) OR TI=(“spastic colon”) OR AB=(“Irritable Bowel Syndrome”) OR AB=(“Irritable Colon”) OR AB=(“Mucous Colitis”) OR AB=(“IBS”) OR AB=(“irritable bowel”) OR AB=(“Colonic Functional Diseases”) OR AB=(“functional gastrointestinal”) OR AB=(“functional bowel”) OR AB=(“spastic colon”)

AND

TI= ("systematic review") OR AB=("systematic review") OR TI=(meta-analysis) OR AB=(meta-analysis) OR TI=(review) OR AB=(review)

Table S2. Meta-analysis and systematic review excluded from study and reasons for exclusion**.**

Study title	Author; year (Ref)	Reason of exclusion
Low FODMAP Diet for Irritable Bowel Syndrome Comes of Age: A Systematic Review and Meta-Analysis	(Khan et al. 2015)	Conference abstract
Large Effects of a Low FODMAPs Diet in Patients with Irritable Bowel Syndrome: A Systematic Review and Meta-Analysis	(Lonshteyn, Chandar, and Falck-Ytter 2014)	Conference abstract
Does a low fodmap diet reduce symptoms associated with functional gastrointestinal disorders? - A meta-analysis	(Marsh, Eslick, and Eslick 2015)	Conference abstract
A systematic review and meta-analysis on the prevalence of non-malignant, organic gastrointestinal disorders misdiagnosed as irritable bowel syndrome	(Poon et al. 2022)	Not relevant
Literature Review: Dietary Intervention Adherence and Adherence Barriers in Functional Gastrointestinal Disorder Studies	(Alfaro-Cruz et al. 2020)	Systematic review without meta-analysis
FODMAPs restricted diet as a treatment option in irritable bowel syndrome: Systematic review	(Andrade et al. 2015)	Systematic review without meta-analysis
Irritable bowel syndrome: dietary interventions	(Ford and Vandvik 2015)	Systematic review without meta-analysis
Dietary interventions for recurrent abdominal pain (RAP) and irritable bowel syndrome (IBS) in childhood	(Huertas-Ceballos et al. 2009)	Systematic review without meta-analysis
Dietary interventions for recurrent abdominal pain (RAP) and irritable bowel syndrome (IBS) in childhood	(Huertas-Ceballos et al. 2014)	Systematic review without meta-analysis
Systematic review: quality of trials on the symptomatic effects of the low FODMAP diet for irritable bowel syndrome	(Krogsgaard, Lyngesen, and Bytzer 2017)	Systematic review without meta-analysis
A Systematic Review of the Effects of Polyols on Gastrointestinal Health and Irritable Bowel Syndrome	(Lenhart and Chey 2017)	Systematic review without meta-analysis
British Dietetic Association evidence-based guidelines for the dietary management of irritable bowel syndrome in adults	(McKenzie et al. 2012)	Systematic review without meta-analysis
British Dietetic Association systematic review and evidence-based practice guidelines for the dietary management of irritable bowel syndrome in adults (2016 update)	(McKenzie et al. 2016)	Systematic review without meta-analysis
Review article: implementation of a diet low in FODMAPs for patients with irritable bowel syndrome-directions for future research	(Mitchell et al. 2019)	Systematic review without meta-analysis
The Effect of Dietary Intervention on Irritable Bowel Syndrome: A Systematic Review	(Moayyedi et al. 2015)	Systematic review without meta-analysis
Consumption of a Low Fermentable Oligo-, Di-,	(Pourmand and	Systematic review without meta-

Mono-saccharides, and Polyols Diet and Irritable Bowel Syndrome: A Systematic Review	Esmaillzadeh 2017)	analysis
Systematic review: Dietary fibre and FODMAP-restricted diet in the management of constipation and irritable bowel syndrome	(Rao, Yu, and Fedewa 2015)	Systematic review without meta-analysis
Clinical application of dietary therapies in irritable bowel syndrome	(A. Rej et al. 2018)	Systematic review without meta-analysis
The Role of Diet in the Treatment of Irritable Bowel Syndrome: A Systematic Review	(Singh et al. 2018)	Systematic review without meta-analysis
Effects of Low-FODMAPS Diet on Irritable Bowel Syndrome Symptoms and Gut Microbiome	(Su et al. 2019)	Systematic review without meta-analysis
Does a low FODMAPs diet reduce symptoms of functional abdominal pain disorders? A systematic review in adult and paediatric population, on behalf of Italian Society of Pediatrics	(Turco et al. 2018)	Systematic review without meta-analysis
Effects of low and high FODMAP diets on human gastrointestinal microbiota composition in adults with intestinal diseases: A systematic review	(Vandeputte and Joossens 2020)	Systematic review without meta-analysis
Low FODMAP Diet and Probiotics in Irritable Bowel Syndrome: A Systematic Review With Network Meta-analysis	(Xie et al. 2022)	Network meta-analysis does not have the necessary data for analysis
Efficacy of a Restrictive Diet in Irritable Bowel Syndrome: A Systematic Review and Network Meta-analysis	(Yu, Lee, Gung, Kim, Kim, Kwon, Kim, Koo, Shin, Jee, Lee, Kim, and Park 2022)	Network meta-analysis does not have the necessary data for analysis

Table S3. Characteristics of the eligible meta-analyses reported investigating the effects of low FODMAP diet vs other diet on different outcomes.

Outcome	Author; year (Ref)	Num of trials extracted from meta study	Num of trials excluded from Meta study	Reason (Ref)	Trials that data were manually extracted from	Total RCT in systematic review and main analysis
Clinical improvement in IBS-SSS	(Wang et al. 2021) (main)	7	-	-	-	13
	(Hahn, Choi, and Chang 2021)	4	-	-	-	
	(Marsh, Eslick, and Eslick 2016)	2	-	-	-	
Total Symptoms	(Hahn, Choi, and Chang 2021) (main)	13	2	Int: Low FODMAP rye bread (just restricted one item in diet) (Laatikainen et al. 2016)/Duration: less than 2 weeks (Pirkola et al. 2018)	4	19
	(Altobelli et al. 2017)	1	1	Duration: less than 2 weeks (Ong et al. 2010)	0	
	(van Lanen, de Bree, and Greyling 2021)	3	0	-	0	
	(So, Loughman, and Staudacher 2022)	0	0	-	1	
	(Marsh, Eslick, and Eslick 2016)	0	2	Int: Equal FODMAP restriction in both groups (Biesiekierski et al. 2013)/ Age: On children (Chumpitazi et al. 2015)	0	
	(Yu, Lee, Gung, Kim,	0	3	Int: Elimination diet (Atkinson et al. 2004)/ Int: just restricted starch and sucrose (Nilholm, Roth,	0	

	Kim, Kwon, Kim, Koo, Shin, Jee, Lee, Kim, et al. 2022)			and Ohlsson 2019)/ Int: Gluten free diet (Shahbazkhani et al. 2015)		
	(Dionne et al. 2018)	0	2	Int: Gluten free diet (Biesiekierski et al. 2011)/ Duration: less than 2 weeks (Hustoft et al. 2017)	0	
	(Xie et al. 2022)	0	1	Int: intervention with almonds (Darvishmoghadam et al. 2019)	0	
	(Wang et al. 2021)	0	1	Language: Spanish (Huaman et al. 2014)	0	
	(Black, Staudacher, and Ford 2022)	0	1	Participant: IBD patients (Pedersen et al. 2017)	0	
Abdominal pain intensity	(Hahn, Choi, and Chang 2021) (main)	8	1	Duration: less than 2 weeks (Pirkola et al. 2018)	4	19
	(Schumann, Klose, et al. 2018)	5	-	-	0	
	(So, Loughman, and Staudacher 2022)	0	-	-	1	
	(Black, Staudacher, and Ford 2022)	0	1	Participant: IBD patients (Pedersen et al. 2017)	1	
	(Marsh, Eslick, and Eslick 2016)	0	2	Int: Equal FODMAP restriction in both groups (Biesiekierski et al. 2013)/ Age: On children (Chumpitazi et al. 2015)	0	

	(Altobelli et al. 2017)	0	1	Duration: less than 2 weeks (Ong et al. 2010)	0	
Abdominal pain frequency	(Hahn, Choi, and Chang 2021) (main)	7	1	Duration: less than 2 weeks (Pirkola et al. 2018)	8	11
	(Black, Staudacher, and Ford 2022)	1	1	Participant: IBD patients (Pedersen et al. 2017)	2	
	(So, Loughman, and Staudacher 2022)	0	-	-	1	
Abdominal distension	(Hahn, Choi, and Chang 2021) (main)	8	1	Int: Low FODMAP rye bread (just restricted one item in diet) (Laatikainen et al. 2016)	9	11
	(Black, Staudacher, and Ford 2022)	0	1	Participant: IBD patients (Pedersen et al. 2017)	1	
	(So, Loughman, and Staudacher 2022)	0	-	-	1	
	(Marsh, Eslick, and Eslick 2016)	0	1	Age: On children (Chumpitazi et al. 2015)	0	
	(Altobelli et al. 2017)	0	1	Duration: less than 2 weeks (Ong et al. 2010)	0	
Dissatisfaction of bowel habit	(Hahn, Choi, and Chang 2021) (main)	8	1	Int: Low FODMAP rye bread (just restricted one item in diet) (Laatikainen et al. 2016)	9	11

	(Altobelli et al. 2017)	0	-	-	1	
	(So, Loughman, and Staudacher 2022)	0	-	-	1	
	(Black, Staudacher, and Ford 2022)	0	1	Participant: IBD patients (Pedersen et al. 2017)	0	
Interference on life in general	(Wang et al. 2021) (main)	5	-	-	0	9
	(Hahn, Choi, and Chang 2021)	0	1	Int: Low FODMAP rye bread (just restricted one item in diet) (Laatikainen et al. 2016)	2	
	(Black, Staudacher, and Ford 2022)	0	1	Participant: IBD patients (Pedersen et al. 2017)	1	
	(So, Loughman, and Staudacher 2022)	0	-	-	1	
Urgency of defecation	(Black, Staudacher, and Ford 2022) (main)	0	-	-	4	6
	(Altobelli et al. 2017)	0	-	-	2	
	(Hahn, Choi, and Chang 2021)	0	1	Duration: less than 2 weeks (Pirkola et al. 2018)	0	

Bloating	(Altobelli et al. 2017) (main)	3	-	-	1	10
	(Black, Staudacher, and Ford 2022)	0	-	-	4	
	(Hahn, Choi, and Chang 2021)	0	1	Duration: less than 2 weeks (Pirkola et al. 2018)	2	
	(Marsh, Eslick, and Eslick 2016)	0	2	Int: Equal FODMAP restriction in both groups (Biesiekierski et al. 2013)/ Age: On children (Chumpitazi et al. 2015)	0	
Stool frequency	(Wang et al. 2021) (main)	6	-	-	0	9
	(Black, Staudacher, and Ford 2022)	0	-	-	2	
	(Hahn, Choi, and Chang 2021)	1	-	-	0	
	(Marsh, Eslick, and Eslick 2016)	0	1	Age: On children (Chumpitazi et al. 2015)	0	
Stool consistency	(Hahn, Choi, and Chang 2021) (main)	4	-	-	1	9
	(Wang et al. 2021)	2	-	-	0	
	(Altobelli et al. 2017)	1	-	-	0	
	(Black,	0	-	-	1	

	Staudacher, and Ford 2022) (Marsh, Eslick, and Eslick 2016)	0	2	Int: Equal FODMAP restriction in both groups (Biesiekierski et al. 2013)/ Age: On children (Chumpitazi et al. 2015)	0	
Diarrhea	(Black, Staudacher, and Ford 2022) (main)	0	-	-	2	4
	(Altobelli et al. 2017)	0	-	-	1	
	(Hahn, Choi, and Chang 2021)	0	-	-	1	
Constipation	(Black, Staudacher, and Ford 2022) (main)	0	-	-	2	4
	(Altobelli et al. 2017)	0	-	-	1	
	(Hahn, Choi, and Chang 2021)	0	-	-	1	
IBS-QoL	(Hahn, Choi, and Chang 2021) (main)	10	1	Int: Low FODMAP rye bread (just restricted one item in diet) (Laatikainen et al. 2016)	11	13
	(So, Loughman, and Staudacher 2022)	0	-	-	1	

	(Black, Staudacher, and Ford 2022)	0	1	Participant: IBD patients (Pedersen et al. 2017)	1	
	(Wang et al. 2021)	0	1	Language: Spanish (Huaman et al. 2014)	0	
HADs-Anxiety	(Hahn, Choi, and Chang 2021) (main)	0	-	-	4	5
	(So, Loughman, and Staudacher 2022)	0	-	-	1	
HADs-Depression	(Hahn, Choi, and Chang 2021) (main)	0	-	-	4	5
	(So, Loughman, and Staudacher 2022)	0	-	-	1	
Flatulence	(Black, Staudacher, and Ford 2022) (main)	0	-	-	3	5
	(Altobelli et al. 2017)	0	1	Duration: less than 2 weeks (Ong et al. 2010)	1	
	(Hahn, Choi, and Chang 2021)	0	1	Duration: less than 2 weeks (Pirkola et al. 2018)	1	
	(Marsh, Eslick, and Eslick	0	2	Int: Equal FODMAP restriction in both groups (Biesiekierski et al. 2013)/ Age: On children	0	

	2016)			(Chumpitazi et al. 2015)		
Lethargy	(Black, Staudacher, and Ford 2022) (main)	0	-	-	2	3
	(Altobelli et al. 2017)	0	1	Duration: less than 2 weeks (Ong et al. 2010)	1	
	(Marsh, Eslick, and Eslick 2016)	0	1	Int: Equal FODMAP restriction in both groups (Biesiekierski et al. 2013)	0	
Incomplete defecation	(Black, Staudacher, and Ford 2022) (main)	0	-	-	3	4
	(Altobelli et al. 2017)	0	-	-	1	
Borborygmus	(Black, Staudacher, and Ford 2022) (main)	0	-	-	2	3
	(Altobelli et al. 2017)	0	-	-	1	
Belching	(Black, Staudacher, and Ford 2022) (main)	0	-	-	3	3
Heartburn	(Black, Staudacher, and Ford 2022)	0	-	-	2	3

(main) (Altobelli et al. 2017)	0	1	Duration: less than 2 weeks (Ong et al. 2010)	1
(Marsh, Eslick, and Eslick 2016)	0	1	Age: On children (Chumpitazi et al. 2015)	0
(Hahn, Choi, and Chang 2021)	0	1	Duration: less than 2 weeks (Pirkola et al. 2018)	0

Table S4. Characteristic of randomized controlled trials that evaluated the effect of the low FODMAP diet on different outcome of irritable bowel syndrome patients and were eligible to be included in systematic review

Author, Year (ref)	Country	Sex, Age	Population characteristics	Num of participants (Int, Cont)	Diagnosis Method	Study Design	Randomization and Blinding	Study duration (Week)	Type of diet in Int group (Grams of FODMAPs)	Type of diet in Cont group (Grams of FODMAPs)	Adherence	adverse effect	Tool	Outcome Result
(Bennet et al. 2018)	Sweden	Both, 42.5	IBS-D, IBS-C, IBS-M (moderate to severe)	67 (33, 34)	ROME III	Parallel	Randomized Single-Blind	4	Low FODMAP diet (3.8 gr)	Traditional dietary IBS advice (13.5 gr)	Good adherence	NM	Microbial diversity	Cont Diet: unaltered bacterial profiles Int Diet: reduced abundance of some bacteria
(Böhn et al. 2015)	Sweden	Both, 42.5	IBS-D, IBS-C, IBS-M (moderate to severe)	75 (38, 37)	ROME III	Parallel	Randomized Single-Blind	4	Low FODMAP diet (3.8 gr)	Traditional dietary IBS advice (13.5 gr)	Good adherence	NM	IBS-SSS	Reduced in both groups (not significant between groups)
													BSF	Stool frequency improved in Int group. Stool consistency remained unaltered in both groups
(Catinean et al. 2019)	Romania	Both, 39	non-constipation IBS (mild to severe)	60 (30, 30)	ROME III	Parallel	Randomized No-Blinding	3.4	Rifaximin+Low FODMAP diet (NM)	Rifaximin+Nutraceutical (NM)	NM	NM	IBS-SSS	There was an overall statistically significant difference between groups.
													IBS-QoL	There was an overall statistically significant mean difference between groups.
(S.L. Eswaran et al. 2016)	USA	Both, 43	IBS-D (NM)	84 (45, 39)	ROME III	Parallel	Randomized Double-Blind	4	Low FODMAP diet (39.18 gr)	The Standard Diet based on NICE guidelines (63.26 gr)	NM	NM	VAS	52% of the LFD group vs. 41% of the mNICE group reported adequate relief of their symptoms.
													BSF	A LFD reported improvement in stool consistency compared with of mNICE subjects
(S. Eswaran et al. 2017)	USA	Both, 43	IBS-D (NM)	84 (45, 39)	ROME III	Parallel	Randomized Double-Blind	4	Low FODMAP diet (39.18 gr)	The Standard Diet based on NICE guidelines (63.26 gr)	NM	NM	IBS-QoL	QoL improved significantly in both groups, but

													HADs	the magnitude of improvement was significantly greater in the LFD Anxiety and Depression scores improved significantly for subjects on the LFD.
(Goyal et al. 2021)	India	Both, 42	IBS-D (moderate to severe)	101 (52, 49)	ROME IV	Parallel	Randomized No-Blinding	4	Low FODMAP diet (4.6 gr)	Traditional dietary IBS advice (20.87 gr)	No adherence	NM	IBS-SSS	The mean IBS-SSS in LFD group was significantly lower than TDA group.
													IBS-QoL	The reduction in IBS-QoL was significantly higher in LFD group compared with TDA group.
													BSF	Stool frequency and consistency showed significant improvement in LFD group only.
(Guerreiro, Sousa Guerreiro, and Cravo 2019)	Portugal	Both, 49	IBS-D, IBS-C, IBS-M (NM)	70 (47, 23)	ROME IV	Parallel	No-Randomization No-Blinding	4	Low FODMAP diet (3.9 gr)	The Standard Diet based on NICE guidelines (10.3 gr)	Good adherence	NM	BISS	The LFD proved to be more effective in relation to the SD in reducing pain and diarrhea.
													IBS-QoL	The overall score for QoL ↑ significantly in both groups, with no statistically significant difference between groups.
(Halmos et al. 2014)	Australia	Both, 43	IBS-D, IBS-C, IBS-M, IBS-U (NM)	30 (30, 30)	ROME III	Cross-Over	Randomized Double-Blind	3	Low FODMAP diet (3.05 gr)	Typical Australian diet (23.7 gr)	Good adherence	NM	VAS	At the end, overall GI symptoms between the diets was statistically significant.
													Fecal frequency (KSC)	The only significant differences in fecal characteristics were a lower KSC

														score and reduced stool frequency on the low FODMAP diet compared with the typical Australian diet in IBS-D subtype. No other differences were observed.
(Halmos et al. 2015)	Australia	Both, 43	IBS-D, IBS-C, IBS-M, IBS-U (NM)	27 (27, 27)	ROME III	Cross-Over	Randomized Double-Blind	3	Low FODMAP diet (3.05 gr)	Typical Australian diet (23.7 gr)	Good adherence	NM	Stool SCFA Microbial diversity	No differences were seen in total or specific fecal SCFA. The LFD had a lower total bacterial load compared with Cont diets. The abundance of the butyrate-producing bacteria, the prebiotic bacteria, Bifidobacteria spp and the mucus-associated bacterium, A. muciniphila, was greater on the typical Australian diet.
(Harvie et al. 2017)	New Zealand	Both, 41	IBS-D, IBS-C, IBS-M (moderate)	50 (23, 27)	ROME III	Parallel	Randomized No-Blinding	12	Low FODMAP diet (12 gr)	Habitual diet (28 gr)	NM	NM	IBS-SSS IBS-QoL	The change in IBS-SSS from baseline to 3 mo was statistically significantly larger in Int group than Cont group. At 3 mo there was a clinically (≥ 10 units) and statistically significant greater improvement in IBS-QoL in Int group vs Cont group.

													Microbial diversity	There was no change seen in the intestinal microbiome when participants adopted a low FODMAP diet.
(Krieger-Grübel et al. 2020)	Switzerland	Both, 30	NM (mild to severe)	29 (29, 29)	ROME IV	Cross-Over	Randomized No-Blinding	3	Low FODMAP diet (NM)	Low lactose diet (NM)	NM	NM	IBS-SSS	The total IBS-SSS score was significantly reduced after both diets and there was no significant difference between the two dietary intervention phases.
													BSF	The LFD slightly reduced the frequency of loose stool compared with baseline (but not washout) and increased the frequency of days with no stool. The LLD appeared to have no effect on stool frequency.
(McIntosh et al. 2017)	Canada	Both, 50	IBS-D, IBS-C, IBS-M, IBS-U (mild to severe)	37 (19, 18)	ROME III	Parallel	Randomized Single-Blind	3	Low FODMAP diet (NM)	High FODMAP diet (NM)	NM	NM	IBS-SSS	Significant symptoms improvement in LFD group and compared Cont group.
													Lactulose breath test	Small differences in H2 AUC were observed in the post in the high FODMAP group compared with the low FODMAP group. No differences were observed in the methane measurements between the two

														diet groups.
(Paduano et al. 2019)	Italy	Both, 28	IBS-D, IBS-C, IBS-M (mild to severe)	92 (34, 58)	ROME IV	Parallel	No-Randomization No-Blinding	4	Low FODMAP diet (NM)	Gluten-free diet (NM) Balanced diet (NM)	Good adherence	NM	IBS-SSS,	↓ IBS-SSS in both groups. Not significant between groups.
													IBS-QoL	The LFD did not show greater efficacy in improving the QoL
													BSF	The difference was statistically significant showing the efficacy of a LFD intake in normalizing stool solidity. No statistically significant difference in stool solidity was observed after the gluten-free and balanced diets.
Patcharatrakul et al. 2019)	Thailand	Both, 51	IBS-D, IBS-C, IBS-M (mild to severe)	62 (30, 32)	ROME III	Parallel	Randomized No-Blinding	4	Low FODMAP diet (9.6 gr)	Brief advice on a commonly recommended diet (15.4 gr)	No adherence	NM	VAS	Global IBS symptom severity score in the LFD group was significantly lower in than the BRD group.
													BSF	Stool frequency was significantly improved in constipation patients in both groups but there was no differences between groups.
(Pedersen et al. 2014)	Denmark	Both, 37	IBS-D, IBS-C, IBS-M (mild to severe)	82 (42, 40)	ROME III	Parallel	Randomized No-Blinding	6	Low FODMAP diet (NM)	Habitual diet (NM)	Not evaluated	NM	IBS-SSS,	There was a significant reduction of IBS-SSS in each treatment group.
													IBS-QoL	No statistically

														significant improvement in IBS-QOL was observed in LFD as compared to the Cont group.
													HADs	No statistically significant differences concerning either anxiety or depression in each groups.
(Peters et al. 2016)	Australia	Both, 35	IBS-D, IBS-C, IBS-M (mild to severe)	49 (24, 25)	ROME III	Parallel	Randomized No-Blinding	6	Low FODMAP diet (NM)	Habitual diet + Gut-directed hypnotherapy (NM)	Good adherence	NM	VAS,	Overall GI symptoms from baseline for both treatments but no significant differences across groups.
													IBS-QoL	IBS-QoL was significantly improved in both groups but there was no difference in the change across the groups.
													HADs	HADs-A and HADs-D reduced in Int group and HADs-A in Cont group.
(Anupam Rej et al. 2022)	UK	Both, 37	IBS-D, IBS-M (mild to severe)	102 (33, 69)	ROME IV	Parallel	Randomized No-Blinding	4	Low FODMAP diet (7.6 gr)	Traditional dietary IBS advice (15.2 gr) Gluten-free diet (22.4 gr)	No adherence	NM	IBS-SSS,	Significant total symptoms reduction was seen in each group but difference across groups did not differ across groups.
													IBS-QoL	IBS-QOL did not differ across groups.
													Stool dysbiosis index	Changes in DI did not differ across groups.

(Schumann, Langhorst, et al. 2018)	Germany	Both, 55	IBS-D, IBS-C, IBS-M (mild to severe)	59 (29, 30)	ROME III	Parallel	Randomized Single-Blind	12 & 24	Low FODMAP diet (NM)	Habitual diet + Yoga (NM)	No adherence	NM	IBS-SSS,	IBS-SSS total score decreased in both groups, however, no statistically significant group differences at week 12 or 24.
													IBS-QoL	No significant differences in IBS-QoL between groups.
													HADs	↓HADS-A in yoga group, ↔ HADS-D between-group
(H. Staudacher et al. 2012)	UK	Both, 35	IBS-D, IBS-C, IBS-M (mild to severe)	41 (22, 19)	ROME III	Parallel	Randomized No-Blinding	4	Low FODMAP diet (17.7 gr)	Habitual diet (29.6 gr)	NM	NM	VAS	More patients in the Int group reported adequate symptom relief compared with the Cont group.
													BSF,	The Int group reported lower stool frequency than the Cont group and a greater proportion of stools with normal consistency.
													Fecal microbiota	↓Bifidobacteria in LFD group. There was no difference in total or individual fecal SCFA between groups
(H.M. Staudacher et al. 2017)	UK	Both, 35	IBS-D, IBS-M, IBS-U (mild to severe)	104 (51, 53)	ROME III	Parallel	Randomized Double-Blind	4	Low FODMAP diet (9.9 gr)	Sham diet (17.4 gr)	Good adherence	NM	IBS-SSS, GSRS,	More reduction in total symptoms was seen in LFD.
													IBS-QoL	There were no differences between groups in total score for QoL.
													BSF	Stool consistency improved in LFD but stool frequency did not have

														significant differences between goups.
(H.M. Staudacher et al. 2021)	UK	Both, 35	IBS-D, IBS-M, IBS-U (mild to severe)	95 (47, 48)	ROME III	Parallel	Randomized No-Blinding	4	Low FODMAP diet (8.7 gr)	Sham diet (16.2 gr)	Good adherence	NM	Microbial diversity	The LFD group had lower abundance of Bifidobacterium, an unclassified genus in the Ruminococcaceae family, and higher abundance of Bacteroides genus.
(Wilson et al. 2020)	UK	Both, 35	IBS-D, IBS-M, IBS-U (mild to severe)	45 (22, 23)	ROME III	Parallel	Randomized No-Blinding	4	Low FODMAP diet (9.7 gr)	Sham diet (15.3 gr)	Good adherence	NM	IBS-SSS, GSRS IBS-QoL BSF	Symptoms relived in both groups. no differences between the groups in the IBS-QoL Stool frequency and consistancy improved in LFD group, Microbiota diversity did not differ between the groups, Significant increase of SCFA in the LFD group
(Zahedi, Behrouz, and Azimi 2018)	Iran	Both, 37	IBS-D (mild to severe)	101 (50, 51)	ROME III	Parallel	Randomized Single-Blind	6	Low FODMAP diet (Less than 0.5 gr per meal)	The general dietary advice (NM)	Good adherence	NM	IBS-SSS, IBS-QoL BSF	Improved in both groups. Improved in both groups.
(Zhang et al. 2021)	China	Both, 42	IBS-D (mild to severe)	100 (51, 49)	ROME III	Parallel	Randomized No-Blinding	3	Low FODMAP diet (1.89 gr)	Traditional dietary IBS advice (7.70 gr)	Good adherence	NM	VAS, BSF, IBS-QoL	All symptoms, except stool consistency, showed significant improvement with the LFD. Abdominal pain, stool consistency, excessive wind, and urgency improved with TDA. IBS-QoL improved in both groups.

	Fecal SCFAs, Microbial diversity	LFD: ↓ n-butyric acid, ↑ i-butyric and i-valeric acids, ↔ acetic acid, propionic acid, n-butyric acid, i-butyric acid, n-valeric acid, and i-valeric acid. The microbial community structures were similar after both interventions.

BRD: Brief recommended diet; **BSF:** Bristol stool form**; BISS:** Birmingham IBS Symptom Score; **FODMAP:** Fermentable oligosaccharides, disaccharides, monosaccharides and polyols**; GSRS:** Gastrointestinal symptom rating scale; **HADs:** Hospital anxiety and depression scale**; KSC:** King's Stool Chart**; LFD:** Low FODMAP diet**; NM:** not mentioned**; IBS-D:** Irritable bowel syndrome diarrhea predominant**; IBS-C:** IBS constipation predominant**; IBS-M:** IBS mix diarrhea and constipation**; IBS-U:** IBS unsub-type; **IBS-SSS:** IBS severity symptoms score**; IBS-QoL:** IBS quality of life**; SCFA**: short chain fatty acid**; TDA:** traditional dietary advice**; VAS:** visual analog scale**.**

Table S5. Methodological quality of included systematic reviews using AMSTAR 2.

Author, year (ref.)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Quality of evidence
(Altobelli et al. 2017)	Yes	PY	Yes	PY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Black, Staudacher, and Ford 2022)	Yes	Yes	Yes	PY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
(Dionne et al. 2018)	Yes	Yes	Yes	PY	Yes	Yes	PY	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Moderate
(Hahn, Choi, and Chang 2021)	Yes	PY	Yes	PY	Yes	Yes	PY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Low
(Marsh, Eslick, and Eslick 2016)	Yes	No	Yes	PY	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	No	Critically low
(Schumann, Klose, et al. 2018)	Yes	No	Yes	PY	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Critically low
(So, Loughman, and Staudacher 2022)	Yes	No	Yes	PY	Yes	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	Yes	Critically low
(van Lanen, de Bree, and Greyling 2021)	Yes	No	Yes	PY	Yes	Yes	PY	PY	No	Yes	Yes	No	No	Yes	Yes	Yes	Critically low
(Wang et al. 2021)	Yes	No	Yes	PY	Yes	Yes	PY	PY	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Low
(Xie et al. 2022)	Yes	No	Yes	PY	Yes	Yes	Yes	No	No	No	Yes	No	No	Yes	No	No	Critically low
(Yu, Lee, Gung, Kim, Kim, Kwon, Kim, Koo, Shin, Jee, Lee, Kim, et al. 2022)	Yes	Yes	Yes	PY	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High

ref, reference; PY, partially yes. Q1: Did the research questions and inclusion criteria for the review include the components of PICO?, Q2: 2. Did the report of the review contain an explicit statement that the review methods were established prior to the conduct of the review and did the report justify any significant deviations from the protocol?; Q3, Did the review authors explain their selection of the study designs for inclusion in the review?; Q4, Did the review authors use a comprehensive literature search strategy?; Q5, Did the review authors perform study selection in duplicate?; Q6, Did the review authors perform data extraction in duplicate?; Q7, Did the review authors provide a list of excluded studies and justify the exclusions?; Q8, Did the review authors describe the included studies in adequate detail?; Q9, Did the review authors use a satisfactory technique for assessing the risk of bias?; Q10, Did the review authors report on the sources of funding?; Q11, Did the review authors use appropriate methods for statistical combination of results?; Q12, Did the review authors assess the potential impact of RoB in individual studies on the results?; Q13, Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?; Q14, Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity?; Q15, Did the review authors carry out an adequate investigation of publication bias?; Q16, Did the review authors report any potential sources of conflict of interest?

Table S6. Study quality and risk of bias assessment using Cochrane collaboration tool.

Author	Year	Random sequence generation	Allocation concealment	Blinding of participants and personal	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Overall quality
Bennet	2017	Low	Unclear	Unclear	High	Low	Low	Poor
Böhn	2015	Low	Low	Low	High	Low	Unclear	Fair
Catinean	2019	Unclear	Unclear	High	High	Low	Low	Poor
Eswaran	2017	Low	Unclear	Low	High	Low	Low	Poor
Eswaran	2016	Low	Unclear	Low	High	Low	Low	Poor
Goyal	2021	Low	Low	Low	High	Low	Low	Good
Guerreiro	2020	Unclear	Low	High	High	High	Low	Poor
Halmos	2015	Low	Unclear	Low	High	Low	Low	Poor
Halmos	2017	Low	Unclear	Low	High	Low	Low	Poor
Harvie	2017	Low	Low	High	High	High	Low	Poor
Krieger-Grübel	2020	Low	Unclear	High	High	Low	Low	Poor
McIntosh	2016	Low	Low	Low	Low	Low	Low	Good
Paduano	2019	High	High	High	High	High	Unclear	Poor

Patcharatrakul	2019	Unclear	Unclear	Low	High	Low	Unclear	Poor
Pedersen	2014	Low	Low	High	High	High	Unclear	Poor
Peters	2016	Unclear	Unclear	High	High	Low	Low	Poor
Rej	2022	Unclear	Unclear	Unclear	Unclear	High	Unclear	Poor
Schumann	2017	Low	Low	High	Low	Low	Low	Fair
Staudacher	2021	Low	Low	Low	High	Low	Low	Fair
Staudacher	2017	Low	Low	Low	High	Low	Low	Fair
Staudacher	2012	Low	Low	Unclear	Unclear	Low	Unclear	Poor
Wilson	2020	Low	Low	Low	Low	Low	Low	Good
Zahedi	2018	Unclear	Unclear	Low	High	Low	Low	Poor
Zhang	2021	Low	Low	Unclear	Low	Low	Low	Fair

Table S7. GRADE evidence for the effect of the low FODMAP diet on different outcome of irritable bowel syndrome patients.

Certainty assessment							Certainty
№ of studies	**№ of participants**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	
Clinical improvement in IBS-SSS							
13	804	Serious [a]	Serious [b]	not serious	not serious	none	⊕⊕◯◯ Low
Total symptom (Hedges'g as effect size)							
19	1214	Serious [c]	not serious	not serious	Serious [d]	none	⊕⊕◯◯ Low
Total symptom (WMD as effect size)							
13	854	Serious [e]	Serious [f]	not serious	Serious [g]	none	⊕◯◯◯ Very low
Abdominal pain intensity							
19	1257	Serious [h]	Not serious [i]	not serious	Not serious [j]	none	⊕⊕⊕◯ Moderate
Abdominal pain frequency							
11	785	Serious [k]	not serious	not serious	Serious [l]	none	⊕⊕◯◯ Low
Abdominal distension							
11	785	Serious [m]	not serious	not serious	Serious [l]	none	⊕⊕◯◯ Low
Dissatisfaction of bowel habit							
11	709	Serious [n]	not serious	not serious	Serious [l]	none	⊕⊕◯◯ Low

Table S7. GRADE evidence for the effect of the low FODMAP diet on different outcome of irritable bowel syndrome patients.

Certainty assessment							Certainty
№ of studies	**№ of participants**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	
Interference on life in general							
9	676	Serious [o]	Serious [p]	not serious	Serious [l]	none	⨁◯◯◯ Very low
Urgency of defecation							
6	444	Serious [q]	Serious [r]	not serious	Serious [l]	none	⨁◯◯◯ Very low
Bloating							
8	687	Serious [s]	Serious [t]	not serious	Serious [l]	none	⨁◯◯◯ Very low
Stool frequency							
9	668	Serious [u]	Serious [v]	not serious	Serious [l]	none	⨁◯◯◯ Very low
Stool consistency (Hedges'g as effect size)							
9	655	Serious [w]	Serious [x]	not serious	Serious [l]	none	⨁◯◯◯ Very low
Stool consistency (WMD as effect size)							
8	606	Serious [y]	Serious [z]	not serious	Serious [l]	none	⨁◯◯◯ Very low
Diarrhea							
4	260	Serious [aa]	not serious	Serious [bb]	Serious [l]	none	⨁◯◯◯ Very low
Constipation							

Table S7. GRADE evidence for the effect of the low FODMAP diet on different outcome of irritable bowel syndrome patients.

Certainty assessment							Certainty
№ of studies	**№ of participants**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	
3	190	Serious [cc]	not serious	Serious [bb]	Serious [l]	none	⊕◯◯◯ Very low
IBS- Quality of life							
11	1047	Serious [dd]	not serious	not serious	not serious [ee]	none	⊕⊕⊕◯ Moderate
HADs- Anxiety							
5	377	Serious [ff]	not serious	Serious [bb]	Serious [l]	none	⊕◯◯◯ Very low
HADs- Depression							
5	377	Serious [gg]	Serious [hh]	Serious [bb]	Serious [l]	none	⊕◯◯◯ Very low
Flatulence							
5	347	Serious [ii]	not serious	Serious [bb]	Serious [l]	none	⊕◯◯◯ Very low
Lethargy							
3	190	Serious [jj]	Serious [kk]	Serious [bb]	Serious [l]	none	⊕◯◯◯ Very low
Incomplete defecation							
4	298	Serious [ll]	Serious [mm]	Serious [bb]	Serious [l]	none	⊕◯◯◯ Very low
Borborygmus							

Table S7. GRADE evidence for the effect of the low FODMAP diet on different outcome of irritable bowel syndrome patients.

Certainty assessment							Certainty
№ of studies	**№ of participants**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	
3	190	Serious [nn]	Not serious	Serious [bb]	Serious [l]	none	⨁◯◯◯ Very low
Belching							
3	211	Serious [oo]	not serious	Serious [bb]	Serious [l]	none	⨁◯◯◯ Very low
Heartburn							
3	190	Serious [pp]	not serious	Serious [bb]	Serious [l]	none	⨁◯◯◯ Very low

Explanations

a. Most of trials (10 of 13) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
b. I^2=66.1, P heterogeneity< 0.001. The predefined subgroups and sensitivity analysis did not explain the source of heterogeneity. Downgraded.
c. Most of trials (16 of 19) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
d. Despite >800 participants, the point estimate didn't surpass the MID (±0.06) and the 95% CI included clinically important improvement of symptoms. Downgraded.
e. Most of trials (11 of 13) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
f. I^2=85, P heterogeneity< 0.001. The predefined subgroups and sensitivity analysis did not explain the source of heterogeneity. Downgraded.
g. Despite >800 participants, the 95% of confidence interval was wide.
h. Most of trials (16 of 19) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
i. I^2=65.1, P heterogeneity< 0.001. The subgroup based on diagnosis tools explained the source of heterogeneity. (IBS-SSS: Hedges' g = -0.32; 95% CI: -0.48, -0.16, I^2=19.5, P heterogeneity=0.26). Not downgraded.
j. The point estimate didn't surpass the MID (±0.06) and the 95%CI excludes clinically important improvement of symptoms. Not downgraded.
k. Most of trials (8 of 11) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
l. The sample size did not reach the optimal information size (N ≤ 800). Downgraded.
m. Most of trials (8 of 11) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
n. Most of trials (8 of 11) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
o. Most of trials (6 of 9) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
p. I^2=90.8, P heterogeneity< 0.001. I^2=90.8, P heterogeneity< 0.001. The predefined subgroups and sensitivity analysis did not explain the source of heterogeneity. Downgraded.

q. Most of trials (5 of 6) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
r. I^2=89.4, P heterogeneity< 0.001. The sensitivity analysis did not explain the source of heterogeneity. Downgraded.
s. All of trials were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
t. I^2=75.4, P heterogeneity< 0.001. The predefined subgroups and sensitivity analysis did not explain the source of heterogeneity. Downgraded.
u. Most of trials (7 of 9) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
v. I^2=68.2, P heterogeneity< 0.001. The predefined subgroups and sensitivity analysis did not explain the source of heterogeneity. Downgraded.
w. Most of trials (7 of 9) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
x. I^2=85.4, P heterogeneity< 0.001. The predefined subgroups and sensitivity analysis did not explain the source of heterogeneity. Downgraded.
y. Most of trials (6 of 8) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
z. I^2=87, P heterogeneity< 0.001. The sensitivity analysis did not explain the source of heterogeneity. Downgraded.
aa. Most of trials (3 of 4) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
bb. The number of included trials were less or equal to 5. Downgraded.
cc. Most of trials (2 of 3) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
dd. Most of trials (10 of 11) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
ee. Point estimate did not surpass MID, and 95% CI excludes important benefit and harm (±10 points). Not Downgraded.
ff. All of trials were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
gg. All of trials were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
hh. I^2=61.9, P heterogeneity< 0.001. The sensitivity analysis did not explain the source of heterogeneity. Downgraded.
ii. Most of trials (4 of 5) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
jj. Most of trials (2 of 3) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
kk. I^2=70.1, P heterogeneity= 0.035. The sensitivity analysis did not explain the source of heterogeneity. Downgraded.
ll. Most of trials (3 of 4) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
mm. I^2=91.1, P heterogeneity< 0.001. The sensitivity analysis did not explain the source of heterogeneity. Downgraded.
nn. Most of trials (2 of 3) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
oo. Most of trials (2 of 3) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.
pp. Most of trials (2 of 3) were at fair and poor quality. Main trial limitations were lack of allocation concealment, and personnel and blinding of outcome assessment. Downgraded.

Table S8. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Clinical improvement in IBS-SSS*".

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		RR (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	13	1.42 (1.02, 1.97)	0.04	35.38	<0.001	66.1	
Study design							
Parallel	11	1.46 (0.98, 2.17)	0.06	34.70	<0.001	71.2	0.49
Cross-over	2	1.19 (0.78, 1.83)	0.42	0.0	0.97	0.0	
Study duration							
(≤ 4 weeks)	10	1.63 (1.28, 2.09)	<0.001	13.50	0.14	33.4	0.10
(> 4 weeks)	3	0.56 (0.16, 1.95)	0.36	9.90	0.007	79.8	
Control diet							
Regular diet	10	1.29 (0.86, 1.94)	0.21	29.3	0.001	69.3	
Traditional IBS dietary advice	2	1.52 (0.70, 3.32)	0.29	2.86	0.09	65	0.21
High FODMAP diet	1	3.25 (1.28, 8.27)	0.01	0.0	-	-	
Co-intervention with diet							
No	11	1.40 (0.97, 2.03)	0.07	35.02	<0.001	71.4	0.82
Yes	2	1.55 (0.71, 3.42)	0.28	0.30	0.58	0.0	
Population							
IBS-D	2	1.61 (0.87, 2.99)	0.13	1.89	0.17	47.1	
All IBS subtype	6	1.06 (0.56, 2.00)	0.85	25.67	<0.001	80.5	0.43
Not mentioned IBS subtype	5	1.78 (1.11, 2.83)	0.02	6.57	0.16	39.1	
Diagnosis Method							
ROME III	10	1.28 (0.89, 1.84)	0.20	30.04	<0.001	70	0.11
ROME IV	3	2.33 (1.24, 4.38)	0.008	2.23	0.33	10.3	
Study quality							
Poor	7	1.12 (0.62, 2.02)	0.72	25.31	<0.001	76.3	0.17
Fair	3	1.48 (1.05, 2.08)	0.03	2.64	0.27	24.3	
Good	3	2.24 (1.40, 3.59)	0.001	1.33	0.51	0.0	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; IBS-SSS: IBS severity score scale; RCT: randomized clinical trial; RR: relative risk.

Table S9. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Total symptoms"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		Hedges' g (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	19	-0.56 (-0.70, -0.41)	<0.001	29.01	0.05	38	
Study design							
Parallel	17	-0.53 (-0.68, -0.38)	<0.001	24.78	0.07	35.4	0.28
Cross-over	2	-0.79 (-1.24, -0.34)	0.001	1.62	0.20	38.1	
Study duration							
(≤ 4 weeks)	14	-0.55 (-0.69, -0.40)	<0.001	16.71	0.21	22.2	0.87
(> 4 weeks)	5	-0.58 (-0.97, -0.19)	0.004	12.17	0.02	67.1	
Control diet							
Regular diet	14	-0.56 (-0.73, -0.38)	<0.001	22.83	0.04	43	
Traditional IBS dietary advice	3	-0.40 (-0.78, -0.11	0.01	3.21	0.2	37.7	0.35
High FODMAP diet	1	-1.13 (-1.83, -0.43)	0.002	0.0	-	-	
Gluten free diet	1	-0.45 (-0.87, -0.03)	0.04	0.0	-	-	
Co-intervention with diet							
No	15	-0.62 (-0.77, -0.46)	<0.001	21.37	0.09	34.5	0.02
Yes	4	-0.24 (-0.52, 0.03)	0.08	2.6	0.46	0.0	
Tools							
IBS-SSS	13	-0.16 (-0.67, -0.36)	<0.001	15.94	0.19	24.7	0.61
VAS	6	-0.64 (-0.96, -0.32)	<0.001	11.77	0.04	57.5	
BISS	1	-0.35 (-0.85, 0.14)	0.16	0.0	-	-	
Population							
IBS-D	3	-0.60 (-0.84, -0.36)	<0.001	0.63	0.73	0.0	0.32
All IBS subtype	10	-0.47 (-0.70, -0.24)	<0.001	19.53	0.02	53.9	
Not mentioned IBS subtype	6	-0.72 (-0.93, -0.50)	<0.001	5.02	0.41	0.50	
Diagnosis Method							
ROME III	14	-0.61 (-0.80, -0.42)	<0.001	25.94	0.02	49.9	0.19
ROME IV	5	-0.43 (-0.63, -0.22)	<0.001	0.91	0.92	0.0	
Study quality							
Poor	13	-0.60 (-0.78, -0.42)	<0.001	21.79	0.04	44.9	0.36
Fair	3	-0.37 (-0.64, -0.11)	0.006	1.87	0.39	0.0	
Good	3	-0.59 (-0.99, -0.20)	0.003	3.14	0.21	36.3	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial.

Table S10. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Abdominal pain intensity"*

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		Hedges' g (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	19	-0.32 (-051, -0.13)	0.001	51.53	<0.001	65.1	
Study design							
Parallel	17	-0.27 (-0.44, -0.09)	0.003	33.74	0.006	52.6	0.34
Cross-over	2	-0.63 (-1.35, 0.09)	0.08	4.86	0.03	79.4	
Study duration							
(≤ 4 weeks)	14	-0.32 (-0.56, -0.08)	0.009	49.43	<0.001	73.7	0.89
(> 4 weeks)	5	-0.34 (-0.58, -0.10)	0.005	2.1	0.72	0.0	
Control diet							
Regular diet	13	-0.35 (-0.59, -0.12)	0.003	34.51	0.001	65.2	
Traditional IBS dietary advice	5	-0.12 (-0.37, 0.12)	0.32	6.09	0.19	34.3	0.05
High FODMAP diet	1	-1.12 (-1.82, -0.42)	0.002	0.0	-	-	
Gluten free diet	1	-0.47 (-0.95, 0.01)	0.06	0.0	-	-	
Co-intervention with diet							
No	16	-0.34 (-0.55, -0.14)	0.001	49.71	<0.001	69.8	0.28
Yes	3	-0.10 (-0.49, 0.30)	0.63	0.34	0.84	0.0	
Tools							
IBS-SSS	11	-0.32 (-0.48, -0.16)	<0.001	12.41	0.26	19.5	0.001
VAS	7	-0.44 (-0.79, -0.08)	0.02	21.29	0.002	71.8	
BISS	1	0.67 (0.16, 1.17)	0.01	0.0	-	-	
Population							
IBS-D	4	-0.19 (-0.48, 0.10)	0.21	6.54	0.09	54.1	0.62
All IBS subtype	9	-0.36 (-0.56, -0.17)	<0.001	10.44	0.23	23.4	
Not mentioned IBS subtype	6	-0.32 (-0.83, 0.18)	0.21	30.67	<0.001	83.7	
Diagnosis Method							
ROME III	14	-0.39 (-0.60, -0.18)	<0.001	32.32	0.002	59.8	0.28
ROME IV	5	-0.14 (-0.54, 0.27)	0.50	15.71	0.003	74.5	
Study quality							
Poor	12	-0.39 (-0.63, -0.15)	0.001	30.84	0.001	64.3	0.03
Fair	4	-0.004 (-0.22, 0.21)	0.97	1.53	0.67	0.0	
Good	3	-0.53 (-1.13, 0.07)	0.08	7.05	0.03	71.6	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial; VAS: visual analog scale.

Table S11. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Abdominal pain frequency"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		Hedges' g (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	11	-0.27 (-0.45, -0.08)	0.005	18.75	0.04	46.7	
Study design							
Parallel	10	-0.31 (-0.50, -0.11)	0.002	16.09	.06	44.1	0.11
Cross-over	1	0.02 (-0.33, 0.37)	0.91	0.0	-	-	
Study duration							
(≤ 4 weeks)	8	-0.24 (-0.47, -0.007)	0.04	16.04	0.02	56.4	0.66
(> 4 weeks)	4	-0.31 (-0.54, -0.08)	0.007	2.26	0.52	0.0	
Control diet							
Regular diet	7	-8.99 (-14.42, -3.56)	0.001	5.15	0.53	0.0	
Traditional IBS dietary advice	2	-0.52 (-17.19, 16.15)	0.95	4.7	0.03	78.7	0.05
High FODMAP diet	1	-32.10 (-51.32, -12.89)	0.001	0.0	-	-	
Gluten free diet	1	-2.51 (-13.40, 8.39)	0.65	0	-	-	
Co-intervention with diet							
No	9	-9.22 (-15.56, -2.88)	0.004	16.67	0.03	52	0.18
Yes	2	-0.07 (-11.70, 11.56)	0.99	0.01	0.90	0.0	
Population							
IBS-D	2	-0.37 (-0.64, -0.09)	0.009	0.06	0.81	0.0	0.42
All IBS subtype	7	-0.29 (-0.58, -0.001)	0.049	15.61	0.02	61.6	
Not mentioned IBS subtype	2	-0.09 (-0.41, 0.24)	0.60	1.1	0.29	9.2	
Diagnosis Method							
ROME III	8	-0.33 (-0.57, -0.08)	0.01	14.86	0.04	52.9	0.33
ROME IV	3	-0.15 (-0.40, 0.10)	0.24	2.57	0.28	22.1	
Study quality							
Poor	5	-0.22 (-0.42, -0.03)	0.02	4.37	0.36	8.5	0.26
Fair	3	-0.08 (-0.57, 0.40)	0.74	7.13	0.03	71.9	
Good	3	-0.54 (-0.92, -0.16)	0.006	3.10	0.21	35.5	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial.

Table S12. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Abdominal distension"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		WMD (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	11	-11.63 (-15.89, -7.37)	<0.001	12.42	0.26	19.5	
Study design							
Parallel	10	-11.76 (-16.28, -7.24)	<0.001	12.36	0.19	27.2	0.06
Cross-over	1	-8.54 (-33.30, 16.22)	0.50	0.0	-	-	
Study duration							
(≤ 4 weeks)	8	-8.80 (-13.48, -4.12)	<0.001	8.27	0.31	15.4	0.09
(> 4 weeks)	4	-15.42 (-21.61, -9.23)	<0.001	2.05	0.56	0.0	
Control diet							
Regular diet	7	-12.03 (-16.74, -7.32)	<0.001	6.09	0.41	1.5	
Traditional IBS dietary advice	3	-8.97 (-21.6, 3.71)	0.17	6.20	0.05	67.7	0.52
High FODMAP diet	1	-18.50 (-35.48, -1.52)	0.03	0.0	-	-	
Gluten free diet	1	-4.00 (-16.42, 8.42)	0.53	0.0	-	-	
Co-intervention with diet							
No	9	-10.55 (-14.95, -6.12)	<0.001	9.43	0.31	15.2	0.15
Yes	2	-18.95 (-29.56, -8.35)	<0.001	0.83	0.36	0.0	
Population							
IBS-D	2	-14.89 (-22.11, -7.67)	<0.001	0.72	0.39	0.0	
All IBS subtype	7	-12.06 (-17.83, -6.29)	<0.001	8.30	0.22	27.7	0.20
Not mentioned IBS subtype	2	-3.15 (-13.89, 7.60)	0.57	0.22	0.64	0.0	
Diagnosis Method							
ROME III	8	-12.39 (-16.70, -8.07)	<0.001	6.60	0.47	0.0	0.66
ROME IV	3	-9.26 (-22.55, 4.02)	0.17	5.20	0.07	61.5	
Study quality							
Poor	5	-9.18 (-15.47, -2.87)	0.004	4.40	0.35	9.0	0.58
Fair	3	-13.99 (-20.65, -7.32)	<0.001	2.14	0.34	6.7	
Good	3	-12.56 (-24.23, -0.89)	0.035	4.65	0.09	57	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial.

Table S13. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Dissatisfaction of bowel habit"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		Hedges' g (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	11	-0.46 (-0.62, -0.30)	<0.001	12.49	0.25	19.9	
Study design							
Parallel	9	-0.44 (-0.60, -0.28)	<0.001	8.82	0.36	9.3	0.71
Cross-over	2	-0.58 (-1.30, 0.14)	0.11	3.21	0.07	68.8	
Study duration							
(≤ 4 weeks)	8	-0.45 (-0.66, -0.24)	<0.001	10.12	0.18	30.8	0.74
(> 4 weeks)	3	-0.50 (-0.78, -0.23)	<0.001	2.21	0.33	9.5	
Control diet							
Regular diet	6	-0.53 (-0.71, -0.34)	<0.001	5.65	0.46	0.0	
Traditional IBS dietary advice	3	-0.28 (-0.65, 0.09)	0.14	4.06	0.13	50.8	0.56
High FODMAP diet	1	-0.75 (-1.42, -0.08)	0.03	0.0	-	-	
Gluten free diet	1	-0.43 (-0.91, 0.05)	0.08	0.0	-	-	
Co-intervention with diet							
No	9	-0.50 (-0.68, -0.31)	<0.001	11.2	0.19	28.6	0.27
Yes	2	-0.25 (-0.65, 0.15)	0.21	0.04	0.84	0.0	
Tools							
IBS-SSS	10	-0.43 (-0.58, -0.28)	<0.001	9.41	0.40	4.4	0.08
VAS	1	-0.94 (-1.50, -0.39)	0.001	0.0	-	-	
Population							
IBS-D	2	-0.62 (-0.91, -0.34)	<0.001	0.63	0.43	0.0	
All IBS subtype	6	-0.37 (-0.57, -0.15)	0.01	6.03	0.30	17.1	0.34
Not mentioned IBS subtype	3	-0.54 (-0.97, -0.10)	0.02	3.41	0.18	41.3	
Diagnosis Method							
ROME III	8	-0.48 (-0.71, -0.26)	<0.001	11.60	0.11	39.7	0.69
ROME IV	3	-0.46 (-0.62, -0.30)	0.002	0.70	0.71	0.0	
Study quality							
Poor	5	-0.54 (-0.77, -0.31)	<0.001	5.05	0.28	20.9	0.44
Fair	3	-0.26 (-0.65, 0.14)	0.20	4.30	0.12	53.5	
Good	3	-0.54 (-0.83, -0.24)	<0.001	0.53	0.77	0.0	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial.

Table S14. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Interference on life in general"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		WMD (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	9	-10.70 (-19.78, -1.61)	0.02	87.02	<0.001	90.8	
Study design							
Parallel	8	-12.79 (-22.25, -3.33)	0.008	72.89	<0.001	90.4	0.009
Cross-over	1	5.09 (-4.29, 14.47)	0.29	0.0	-	-	
Study duration							
(≤ 4 weeks)	7	-12.87 (-24.04, -1.69)	0.02	81.22	<0.001	92.6	0.38
(> 4 weeks)	2	-1.51 (-24.01, 20.98)	0.89	4.42	0.04	77.4	
Control diet							
Regular diet	5	-5.49 (-12.72, 1.75)	0.14	18.6	0.001	78.5	
Traditional IBS dietary advice	3	-21.07 (-53.52, 11.39)	0.20	48.56	<0.001	95.9	0.53
High FODMAP diet	1	-8.60 (-21.08, 3.88)	0.18	0.0	-	-	
Gluten free diet	1	-15.00 (-27.93, 2.07)	0.02	0.0	-	-	
Co-intervention with diet							
No	8	-12.79 (-22.25, -3.33)	0.008	72.89	<0.001	90.4	0.009
Yes	1	5.09 (-4.30, 14.48)	0.29	0.0	-	-	
Population							
IBS-D	2	-31.35 (-71.27, 8.56)	0.12	43.60	<0.001	97.7	
All IBS subtype	5	-6.34 (-11.78, -0.90)	0.02	4.46	0.35	10.3	0.46
Not mentioned IBS subtype	2	-4.40 (-21.79, 13.00)	0.62	12.73	<0.001	92.1	
Diagnosis Method							
ROME III	6	-8.88 (-13.43, -4.33)	<0.001	8.98	0.11	44.3	0.55
ROME IV	3	-19.41 (-53.53, 14.72)	0.26	71.45	<0.001	97.2	
Study quality							
Poor	4	-3.18 (-13.56, 7.20)	0.55	11.27	0.01	73.4	0.31
Fair	2	-5.89 (-12.68, 0.90)	0.09	0.30	0.59	0.0	
Good	3	-24.37 (-49.66, 0.93)	0.059	59.35	<0.001	96.6	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial.

Table S15. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Bloating"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		Hedges' g (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	8	-0.03 (-0.31, 0.24)	0.82	28.51	<0.001	75.4	
Study design							
Parallel	7	0.09 (-0.10, 0.28)	0.36	10.93	0.09	45.1	<0.001
Cross-over	1	-0.88 (-1.33, -0.44)	<0.001	0.0	-	-	
Study duration							
(≤ 4 weeks)	7	-0.03 (-0.33, 0.27)	0.85	28.40	<0.001	78.9	0.91
(> 4 weeks)	1	-0.06 (-0.62, 0.50)	0.82	0.0	-	-	
Control diet							
Regular diet	5	-0.13 (-0.61, 0.35)	0.59	24.22	<0.001	83.5	
Traditional IBS dietary advice	3	0.08 (-0.09, 0.23)	0.35	0.91	0.64	0.0	0.41
Co-intervention with diet							
No	7	-0.05 (-0.35, 0.24)	0.73	26.22	<0.001	77.1	0.97
Yes	1	-0.07 (-0.63, 0.50)	0.82	0.0	-	-	
Tools							
IBS-SSS	1	0.55 (0.00, 1.10)	0.05	0.0	-	-	0.04
VAS	7	-0.10 (-0.38, 0.19)	0.50	24.85	<0.001	75.9	
Population							
IBS-D	2	0.14 (-0.25, 0.53)	0.48	2.73	0.09	63.4	
All IBS subtype	3	0.02 (-0.563, 0.56)	0.95	6.84	0.03	70.7	0.66
Not mentioned IBS subtype	3	-0.20 (-0.83, 0.43)	0.53	16.6	<0.001	88.0	
Diagnosis Method							
ROME III	7	0.02 (-0.28, 0.31)	0.91	24.70	<0.001	75.7	0.14
ROME IV	1	-0.38 (-0.80, 0.05)	0.08	0.0	-	-	
Study quality							
Poor	6	-0.11 (-0.44, 0.23)	0.53	24.67	<0.001	79.7	0.39
Fair	2	0.20 (-0.41, 0.81)	0.52	3.42	0.06	70.7	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial.

Table S16. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Stool consistency"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		Hedges, g (95%CI)	P effect	Q statistic	P within	I^2 (%)	P between

					group		group
Overall	9	-0.48 (-0.84, -0.09)	0.02	54.93	<0.001	85.4	
Study duration							
(≤ 4 weeks)	7	-0.46 (-1.01, 0.08)	0.10	53	<0.001	88.7	0.84
(> 4 weeks)	2	-0.53 (-0.73, -0.32)	<0.001	0.67	0.41	0.0	
Control diet							
Regular diet	6	-0.46 (-0.61, -0.31)	<0.001	2.41	0.79	0.0	
Traditional IBS dietary advice	3	-0.66 (-2.06, 0.74)	0.36	38.04	<0.001	94.7	0.78
Co-intervention with diet							
No	8	-0.49 (-0.90, -0.07)	0.02	53.7	<0.001	87.0	0.62
Yes	1	-0.31 (-0.87, 0.24)	0..27	0.0	-	-	
Tools							
BSF	8	-0.48 (-0.90, -0.07)	0.02	53.70	<0.001	87.0	0.62
VAS	1	-0.31 (-0.87, 0.24)	0.27	0.0	-	-	
Population							
IBS-D	4	-0.84 (-1.43, -0.25)	0.006	30.33	<0.001	90.1	
All IBS subtype	3	-0.15 (-0.84, 0.29)	0.51	4.91	0.09	59.3	0.15
Not mentioned IBS subtype	2	-0.20 (-0.66, 0.26)	0.39	0.0	1.00	-	
Diagnosis Method							
ROME III	8	-0.34 (-0.54, -0.13)	0.001	10.80	0.15	35.2	<0.001
ROME IV	1	-1.53 (-1.83, -1.23)	<0.001	0.0	-	-	
Study quality							
Poor	4	-0.49 (-0.66, -0.32)	<0.001	1.52	0.68	0.0	0.47
Fair	3	-0.17 (-0.75, 0.41)	0.57	5.41	0.07	63	
Good	2	-0.89 (-2.20, 0.41)	0.18	14.32	<0.001	85.4	

*P-value < 0.05 was significant.
BSF: Bristol stool form; CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial; VAS: visual analog scale.

Table S17. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"Stool frequency"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		WMD (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	9	-0.36 (-0.61, -0.10)	0.006	25.12	0.001	68.2	
Study duration							
(≤ 4 weeks)	8	-0.30 (-0.56, -0.04)	0.02	18.66	0.009	62.5	0.06
(> 4 weeks)	1	-0.69 (-1.00, -0.38)	<0.001	0.0	-	-	
Control diet							
Regular diet	5	-0.36 (-0.67, -0.05)	0.03	10.49	0.03	61.9	
Traditional IBS dietary advice	4	-0.40 (-0.89, 0.09)	0.11	12.86	0.005	76.7	0.88
Population							
IBS-D	4	-0.61 (-1.02, -0.19)	0.004	11.90	0.008	74.8	
All IBS subtype	2	0.05 (-0.20, 0.31)	0.68	0.34	0.56	0.0	0.008
Not mentioned IBS subtype	3	-0.40 (-0.66, -0.14)	0.003	1.25	0.53	0.0	
Diagnosis Method							
ROME III	8	-0.27 (-0.50, -0.05)	0.02	16.51	0.02	57.6	0.005
ROME IV	1	-1.14 (-1.70, -0.58)	<0.001	0.0	-	-	
Study quality							
Poor	4	-0.58 (-0.79, -0.39)	<0.001	1.33	0.72	0.0	0.002
Fair	3	-0.07 (-0.26, 0.12)	0.49	2.27	0.32	12.1	
Good	2	-0.66 (-1.58, 0.26)	0.16	6.02	0.01	83.4	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; RCT: randomized clinical trial.

Table S18. Subgroup analyses of the RCTs on the effect of low FODMAPs diet on *"IBS-QoL"*.

Study group	Number of Studies	Meta-analysis		Heterogeneity			
		WMD (95%CI)	P effect	Q statistic	P within group	I^2 (%)	P between group
Overall	11	3.53 (0.50, 6.55)	0.02	18.58	0.04	46.2	
Study duration							
(≤ 4 weeks)	6	2.59 (-0.52, 5.71)	0.10	1.68	0.89	0.0	0.51
(> 4 weeks)	5	4.89 (-1.25, 11.02)	0.12	16.86	0.002	76.3	
Control diet							
Regular diet	8	4.45 (0.21, 8.68)	0.04	17.25	0.02	59.4	
Traditional IBS dietary advice	4	1.95 (-1.96, 5.85)	0.33	1.52	0.47	0.0	0.66
Gluten free diet	1	5.00 (-6.62, 16.62)	0.40	0.0	-	-	
Co-intervention with diet							
No	9	3.77 (0.08, 7.47)	0.05	18.09	0.02	55.8	0.95
Yes	2	3.58 (-1.54, 8.70)	0.17	0.23	0.63	0.0	
Population							
IBS-D	4	-0.71 (-3.40, 1.99)	0.61	1.66	0.65	0.0	
All IBS subtype	6	6.38 (2.99, 9.77)	<0.001	5.72	0.33	12.5	0.006
Not mentioned IBS subtype	1	3.70 (-4.94, 12.34)	0.40	0.0	-	-	
Diagnosis Method							
ROME III	7	3.92 (-1.19, 9.03)	0.13	17.53	0.008	65.8	0.81
ROME IV	4	3.16 (-0.19, 6.50)	0.06	0.72	0.87	0.0	
Study quality							
Poor	8	4.75 (0.13, 9.36)	0.04	17.43	0.01	59.8	0.66
Fair	2	2.43 (-2.58, 7.45)	0.34	1.09	0.30	7.8	
Good	1	1.80 (-3.06, 6.66)	0.47	0.0	-	-	

*P-value < 0.05 was significant.
CI: confidence interval; FODMAP: fermentable oligosaccharides, disaccharides, monosaccharides, and polyols; IBS: irritable bowel syndrome; IBS-QoL: IBS quality of life; RCT: randomized clinical trial.

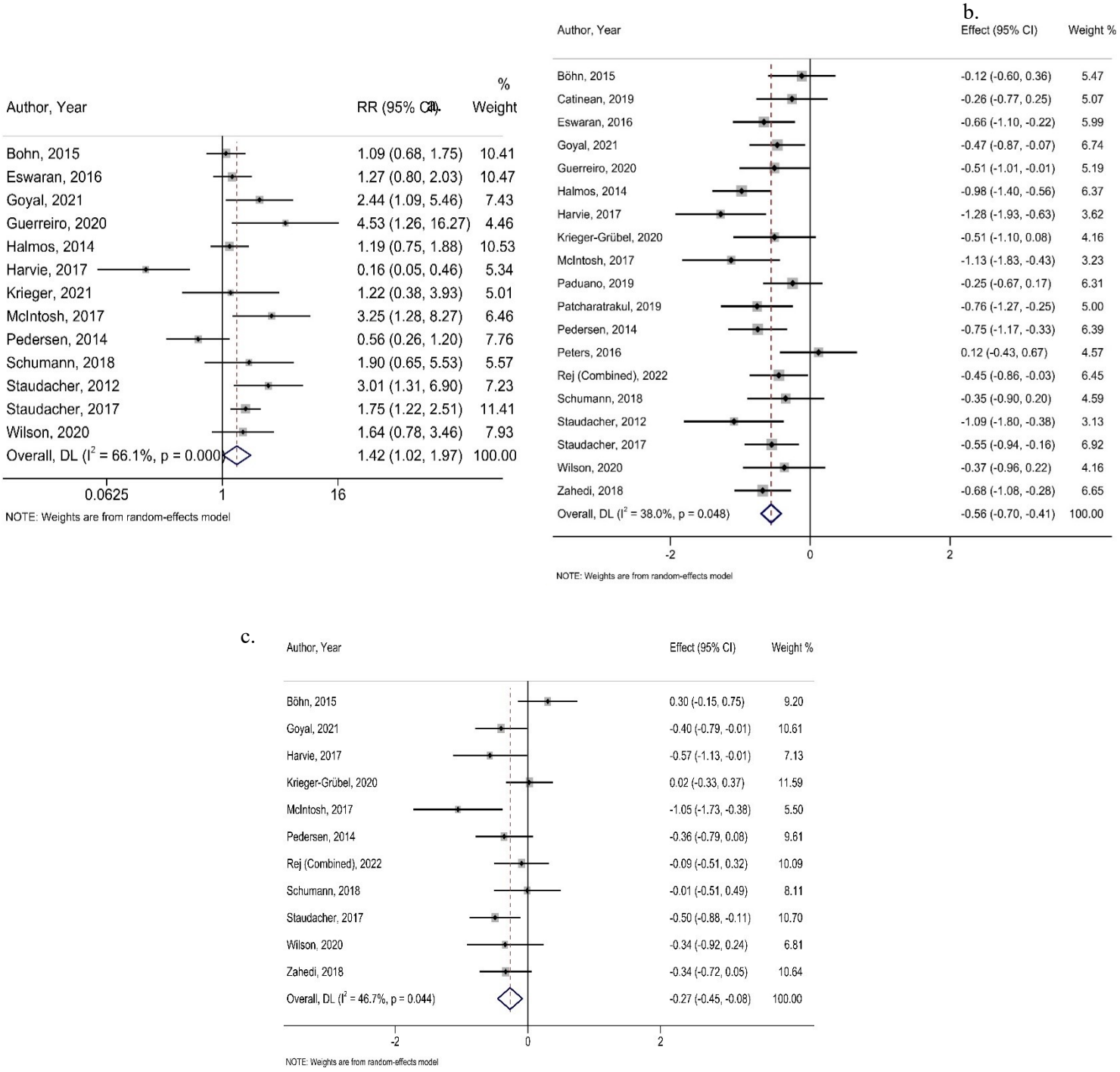
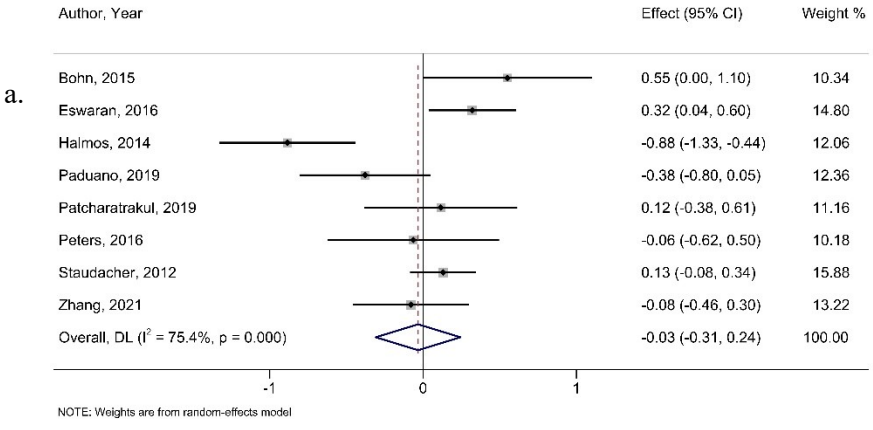


Figure S1. Forest plot of randomized controlled clinical trials illustrating weighted mean difference in a. "Clinical improve in IBS-SSS", b. "Total Symptom (Hedges G)", and c. "Abdominal pain frequency (Hedges G)" between the low FODMAPs diet and control groups for all eligible studies in overall analysis. Analysis was conducted using random effects model.



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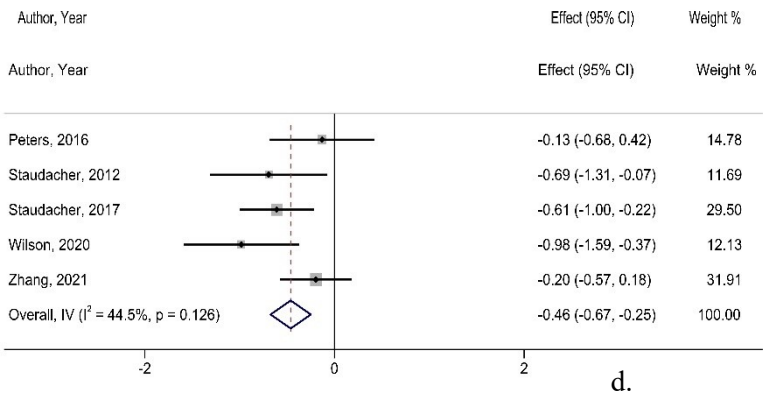

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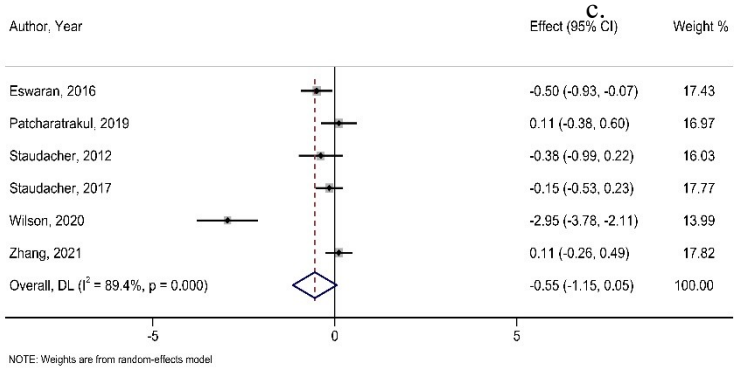


d.

e.

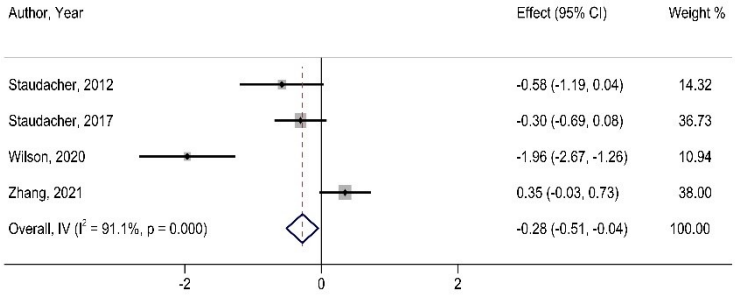
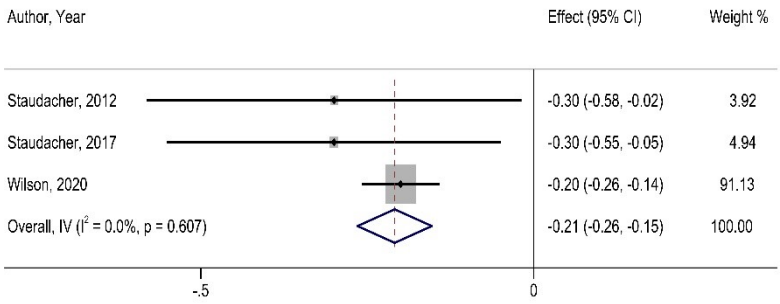
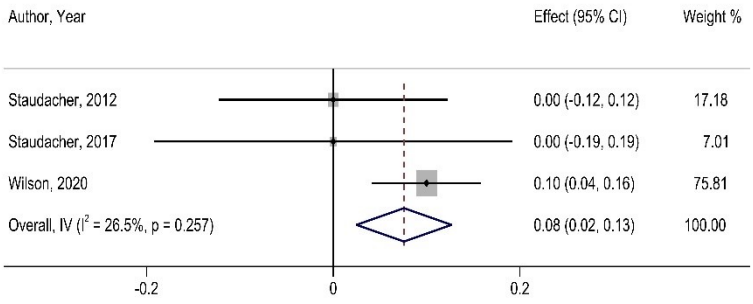


Figure S2. Forest plot of randomized controlled clinical trials illustrating weighted mean difference in a. "Bloating", b. "Belching", c. "Urgency of defecation", d. "Flatulence", e. "Incomplete defecation", f. "Borborygmus", g. "Heartburn" between the low FODMAPs diet and control groups for all eligible studies in overall analysis. Analysis was conducted using random effects model.

f.



g.



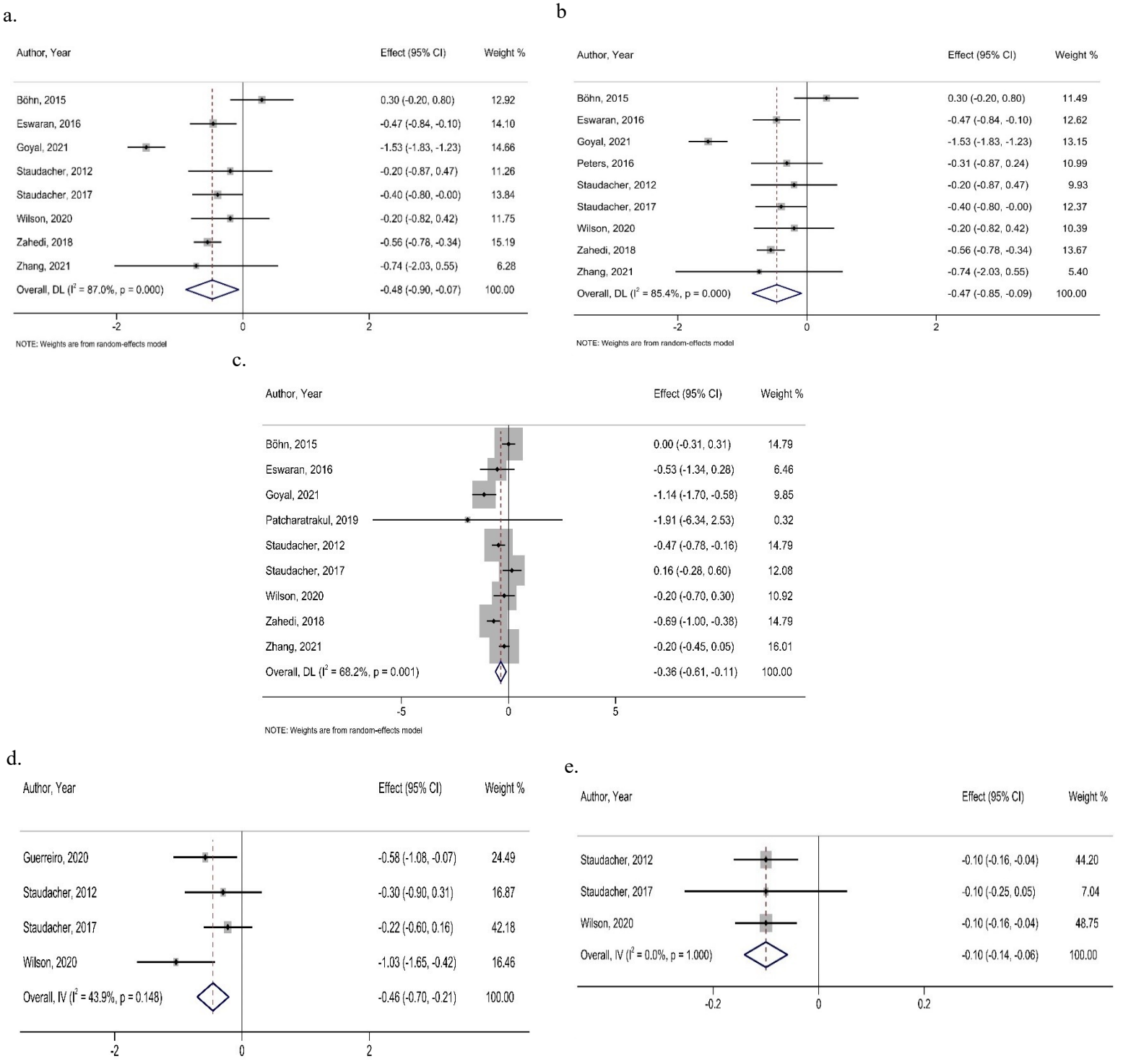


Figure S3. Forest plot of randomized controlled clinical trials illustrating weighted mean difference in a. "Stool consistency (WMD)", b. "Stool consistency (Hedges G)", c. "Stool frequency", d. "Diarrhea", and e. "Constipation", between the low FODMAPs diet and control groups for all eligible studies in overall analysis. Analysis was conducted using random effects model.

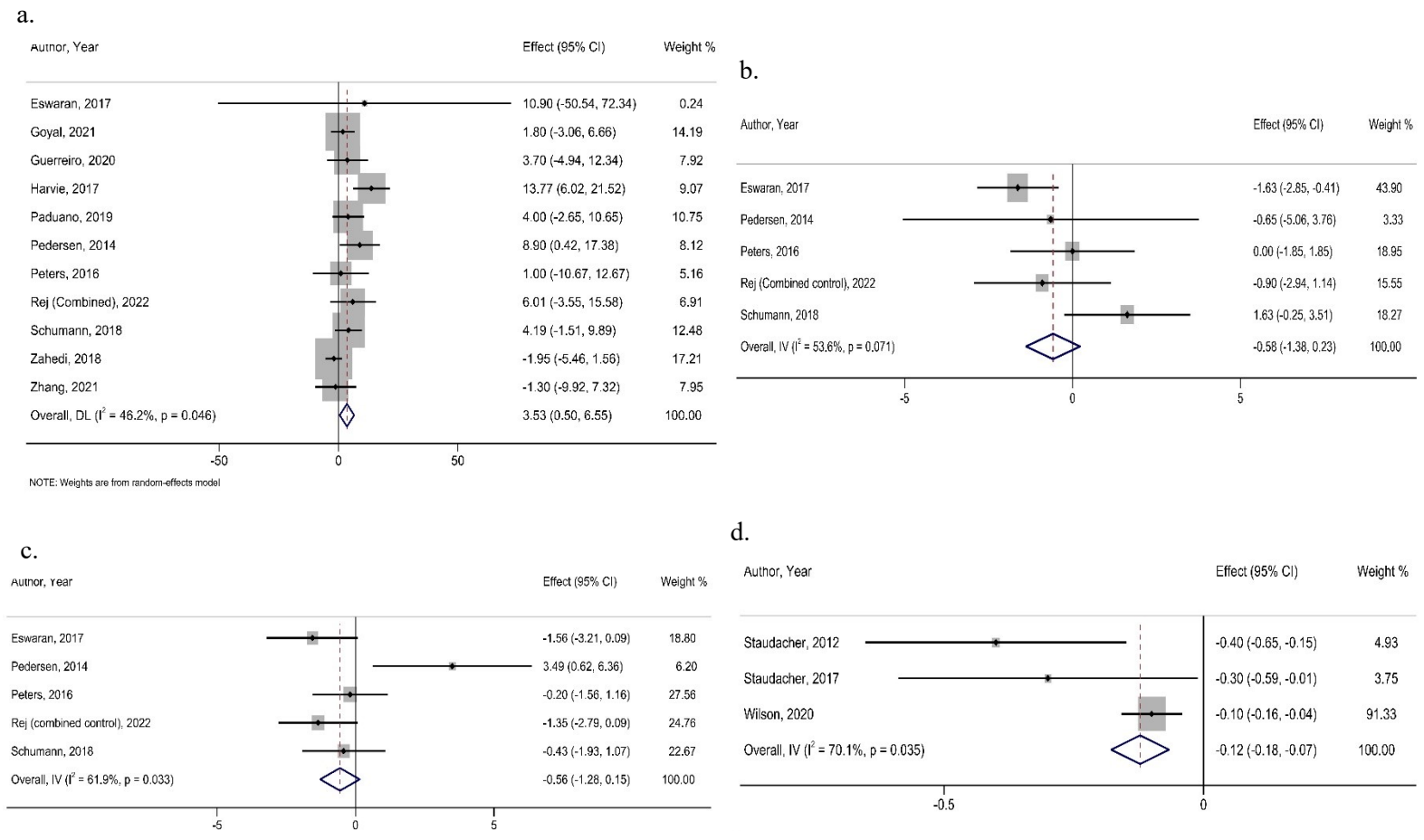


Figure S4. Forest plot of randomized controlled clinical trials illustrating weighted mean difference in a. " Quality of life", b. "HADs-Anxiety", c. "HADs-Depression", d. "Lethargy", between the low FODMAPs diet and control groups for all eligible studies in overall analysis. Analysis was conducted using random effects model.

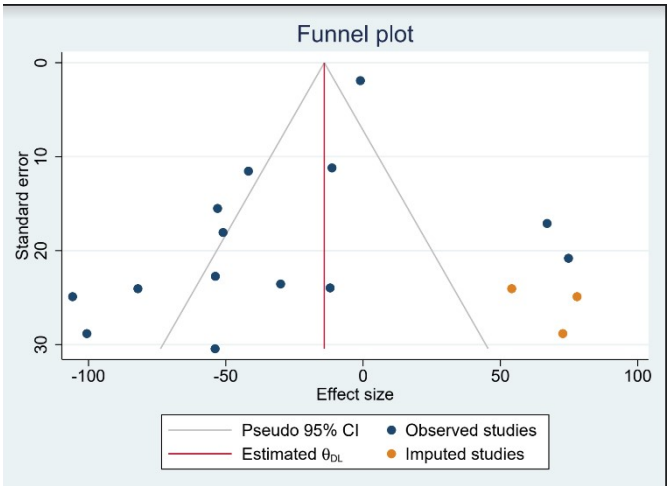


Figure S5. Funnel Plots for assessing probability of publication bias for "total symptoms".

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