Characteristics of studies

Characteristics of included studies

Akita et al. 2019

Methods	prospective randomized control study
Participants	62 patients randomly assigned to either a nutrition intervention (NI) group (n = 31) or a normal diet (ND) group (n =31)
Interventions	eicosapentaenoic acid (EPA)
Outcomes	the pre-to-post ratios (post/pre) of skeletal muscle mass and PMA, the post/pre ratios of other nutritional parameters (serum pre-albumin, serum albumin, BMI, and lymphocyte count, and the severity of treatment-related toxicity)
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	stratified by the severity of diabetes mellitus and Glasgow Prognostic Score
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	31 patients in the treatment arm

Barber et al. 1999

Methods	clinical trial
Participants	20 patients
Interventions	eicosapentaenoic acid (EPA)

Outcomes	weight gain (weight, body composition, dietary intake, resting energy expenditure (REE) and performance status)
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	no randomization
Allocation concealment (selection bias)	Low risk	patients with unresectable pancreatic adenocarcinoma
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	20 patients included

Bayram et al. 2009

Methods	prospective, randomized, single-center, open label study
Participants	52 pediatric patients
Interventions	eicosapentaenoic acid (EPA)
Outcomes	body weight, body mass index, and weight percentile
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	2:1 randomization scheme
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label

Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	33 patients in the treatment arm

Berk et al. 2008

Methods	randomized, double-blind, placebo-controlled trial
Participants	472 patients
Interventions	3 g of HMB, 14 g arginine, and 14 g of glutamine or placebo - an isonitrogenous, isocaloric mixture to the HMB/Arg/Gln containing 7.72 g l-alanine, 4.28 g glycine, 2.96 g l-serine, 1.23 g l-glutamic acid, and 30.52 g gelatin taken twice a day for 8 weeks
Outcomes	the percent of change in lean body mass, body plethysmography, weight, the Schwartz Fatigue Scale, and the Spitzer Quality of Life Scale
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Low risk	double blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	Unclear risk	235 patients in the treatment arm

Bruera et al. 2003

Methods	randomized, double-blind, placebo-controlled trial
Participants	91 patients
Interventions	180 mg of eicosapentaenoic acid (EPA), 120 mg of docosahexaenoic acid [DHA], and 1 mg of vitamin E or placebo - olive oil

Outcomes	Appetite, tiredness, nausea, well-being, caloric intake, nutritional status, and function
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Low risk	double blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	46 patients in the treatment arm

Burden et al. 2017

Methods	single-blind randomized controlled trial
Participants	101 patients
Interventions	Intervention group was given 250 mL/day oral nutrition supplements (10.1 KJ and 0.096 g protein per mL) and dietary advice. Control group received dietary advice alone
Outcomes	patients with one or more surgical site infection (SSI) or chest infection; secondary outcomes included percentage weight loss, total complications, and body composition measurements
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	1:1 ratio by using blocks of two ensuring equal numbers in each group
Allocation concealment (selection bias)	Low risk	sequentially numbered opaque sealed envelopes

Blinding of participants and personnel (performance bias)	Low risk	The research team was blind to the intervention, but the participants were not
Blinding of outcome assessment (detection bias)	Low risk	double blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	Unclear risk	55 patients in the treatment arm

Candela et al. 2011

Methods	randomized placebo-controlled trial
Participants	61 patients
Interventions	an oral powder supplement enriched with eicosapentaenoic acid (EPA) compared to a standard liquid supplement
Outcomes	the Patient-Generated Subjective Global Assessment (pg-SGA), anthropometric measurements (skin folds, circumferences and bioimpedance), dietary parameters (3-day food record), biochemical and inflammatory parameters (basic biochemistry, cytokines, prealbumin and Reactive C Protein)
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	16 patients in the treatment arm

Engelen et al. 2015

Methods	randomized double blind cross-over design
Participants	24 patients
Interventions	14 g of free EAA with high leucine levels (EAA/leucine) versus a balanced amino acid mixture containing both EAA and non-EAA as present in whey protein
Outcomes	Body weight, height, fat, and fat-free mass (FFM), respiratory muscle function, handgrip strength, and endurance. Protein anabolism
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Low risk	double blind cross-over design
Blinding of outcome assessment (detection bias)	Low risk	double blind cross-over design
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	13 patients in the treatment arm

Hanai et al. 2018

Methods	prospective randomized controlled study
Participants	28 patients
Interventions	EPA-enriched oral nutritional supplement (Prosure®) or no dietary intervention
Outcomes	the postoperative nutritional status (weight, lean body mass, albumin, prealbumin), while the secondary endpoints included inflammatory marker levels (CRP, IL6, white blood cell count, body temperature), compliance with the Prosure® dosage, and the occurrence of postoperative complications.
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	14 patients in the treatment arm

Jatoi et al. 2004

Methods	double-blinded, placebo-controlled trial
Participants	421 patients
Interventions	an EPA supplement 1.09 g administered bid plus placebo; MA liquid suspension 600 mg/d plus an isocaloric, isonitrogenous supplement administered twice a day; or both
Outcomes	a 10% weight gain above baseline
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	The stratification process used here was a minimization algorithm that balances the marginal distributions
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Low risk	double blind

Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	Low risk	more than 200 patients in the treatment arm

Kraft et al. 2012

Methods	prospective, multi-centre, placebo-controlled, randomized and double-blinded trial
Participants	72 patients
Interventions	oral L-Carnitine (4 g) or placebo for 12 weeks
Outcomes	adverse effects, quality of life, fatigue, BMI, body composition, survival time, changes in L-carnitine level, CRP, albumine, leucocytes, CA 19-9
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	sequential series of 4 per block
Allocation concealment (selection bias)	Low risk	computer generated randomization code, sealed envelopes
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Low risk	double blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	38 patients in the treatment arm

Kun-Yun Yeh et al 2013

Methods	prospective randomized placebo-controlled clinical trial
Participants	68 patients
Interventions	an Ethanwell/Ethanzyme (EE) regimen enriched with omega-3 fatty acids, micronutrients, and probiotics, or control (Isocal) for a 3-month period
Outcomes	body weight (BW) changes, serum albumin and prealbumin levels
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	1:1 ratio
Allocation concealment (selection bias)	Low risk	random allocation, sealed envelopes
Blinding of participants and personnel (performance bias)	Unclear risk	not specified
Blinding of outcome assessment (detection bias)	Unclear risk	not specified
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	31 patients in the treatment arm

Martinez et al. 2018

Methods	randomized single-blind placebo-controlled clinical trial
Participants	64 patients
Interventions	Eicosapentaenoic acid (EPA)
Outcomes	body composition by bioelectrical impedance analysis and determined IL-1b, IL-6, TNF-a and IFN-g, CRP, serum proteins, and blood count at baseline and at the end of the study
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Low risk	single blind
Blinding of outcome assessment (detection bias)	Unclear risk	single blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	32 patients in the treatment arm

May et al. 2002

Methods	randomized double-blind placebo-controlled clinical trial
Participants	49 patients
Interventions	oral supplementation with a combination of hydroxy--methylbutyrate, arginine, and glutamine or an isonitrogenous control mixture of nonessential amino acids
Outcomes	the change in body mass and fat-free mass (FFM)
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	computer-generated random numbers
Allocation concealment (selection bias)	Low risk	computer-generated random numbers prior to the start of the study in a doubleblind fashion
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Unclear risk	double blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	18 patients in the treatment arm

Palma et al. 2015

Methods	clinical trial (Simon model)
Participants	30 patients
Interventions	50 mg of the crude dry extract of guarana twice a day for 4 weeks
Outcomes	a positive response in the first phase to be at least 5% weight gain or a three-point improvement in the appetite scale in at least three of the first 18 evaluable patients
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	nonrandomized trial
Allocation concealment (selection bias)	Unclear risk	nonrandomized trial
Blinding of participants and personnel (performance bias)	Unclear risk	open label
Blinding of outcome assessment (detection bias)	Unclear risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	18 patients completed the protocol

Persson et al. 2005

Methods	a one-center, randomized, non-placebo controlled, open study
Participants	24 patients
Interventions	4.9 g of eicosapentaenoic acid and 3.2 g of docosahexanoic acid, or 18 mg/d of melatonin for 4 week
Outcomes	changes in tumor necrosis factor-alpha, interleukin-1beta, soluble interleukin-2 receptor, interleukin-6, and interleukin-8 and the fatty acids: eicosapentaenoic acid, docosahexanoic acid, arachidonic acid, and linoleic acid.
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation, non-placebo
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients

Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	13 patients in the fish-oil arm

Schmidt et al. 2019

Methods	non-randomized clinical trial
Participants	41 patients
Interventions	a nutritional drink with fish-oil compared to an equivalent dose of fish-oil administered as capsules
Outcomes	changes in whole blood n-3 LC PUFAs, weight, nutritional status, acceptability or side effects
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	non-randomized
Allocation concealment (selection bias)	Unclear risk	non-randomized
Blinding of participants and personnel (performance bias)	Unclear risk	open label
Blinding of outcome assessment (detection bias)	Unclear risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	13 patients included in the analysis

Storck et al. 2020

Methods	randomized controlled intervention trial
Participants	52 patients
Interventions	a leucine-rich supplement in combination with a nutrition and physical exercise program versus standard care
Outcomes	changes in physical function, physical performance tests, nutritional status, dietary intake, fatigue, quality of life (QoL) and clinical course

Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	a 1:1 ratio using block sizes of six by the data management program secuTrial®
Allocation concealment (selection bias)	Low risk	stratified according to the site of their primary tumor (lung cancer, upper or lower gastrointestinal tract cancer, other)
Blinding of participants and personnel (performance bias)	Unclear risk	not specified
Blinding of outcome assessment (detection bias)	Unclear risk	not specified
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	27 patients in the treatment arm

Strasser et al. 2006

Methods	a multicenter, phase III, randomized, double-Blind, placebo-controlled clinical trial
Participants	243 patients
Interventions	cannabis extract (CE), delta-9-tetrahydrocannabinol (THC), and placebo
Outcomes	appetite, mood, nausea and quality of life (QOL)
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Random assignment lists, stratified by center, were prepared by a naive statistician using SAS software
Allocation concealment (selection bias)	Low risk	study drug sets in multiples of five, together with matching sealed envelopes containing individual treatment assignments

Blinding of participants and personnel (performance bias)	Low risk	Investigators remained blinded until the study ended, with individual unblinding permitted only for safety reasons.
Blinding of outcome assessment (detection bias)	Low risk	The statistician and data manager who were managing random assignment, unblinding, and related decisions were naive to clinical evaluations and uninvolved in data management or analysis
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	Unclear risk	164 patients in the treatment arm

Szefel et al. 2012

Methods	randomized clinical trial
Participants	50 patients
Interventions	total parenteral nutrition (TPN) with long-chain triglycerides (LCTs), or LCTs plus medium-chain triglycerides (MCTs)
Outcomes	L-Carnitine distribution and the effects of parenteral lipid emulsions on plasma L-Carnitine levels and urinary excretion
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	50:50
Allocation concealment (selection bias)	Low risk	randomly divided into 2 groups according to the type of lipid emulsion they were administered: MCT/LCT vs. pure LCT.
Blinding of participants and personnel (performance bias)	Unclear risk	not specified
Blinding of outcome assessment (detection bias)	Unclear risk	not specified
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients

Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	25 patients in the treatment arm

Tayek et al.1986

Methods	A prospective randomized crossover trial
Participants	10 patients
Interventions	a conventional total parenteral nutrition (TPN) formula containing 19% branched chain amino acid (BCAA) and a BCAA-enriched TPN formula containing 50% of the amino acids as BCAA
Outcomes	changes in the whole body leucine kinetics and fractional rates of albumin synthesis
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Unclear risk	not specified
Blinding of outcome assessment (detection bias)	Unclear risk	not specified
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	10 patients included in the study

Taylor et al. 2009

Methods	clinical trial
Participants	31 patients
Interventions	marine phospholipids (1.5 g/day) as softgel capsules for a period of 6 weeks
Outcomes	compliance, changes in body weight, appetite, and quality of life, fatty acid profile in plasma and blood cells
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	non-randomized
Allocation concealment (selection bias)	Unclear risk	no selection
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	17 patients analyzed

Turcott et al. 2018

Methods	a randomized, double-blind, placebo-controlled clinical trial
Participants	47 patients
Interventions	Nabilone vs. placebo
Outcomes	appetite, nutritional status, and quality of life
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Low risk	double blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	9 patients in the treatmend arm finished the study

Werner et al. 2017

Methods	a randomized controlled double blind trial
Participants	60 patients
Interventions	marine phospholipids versus fish oil
Outcomes	compliance, quality of life, nutritional habits and changes in routine blood parameters, lipid profiles, body weight, and appetite
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	not specified
Allocation concealment (selection bias)	Low risk	Randomization and masking was performed with assignment envelopes containing the letter A or B, which were prepared by a non-involved external party (Membramed GmbH).
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Low risk	Assignment code was revealed at the end of the study by Membramed GmbH
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	31 patients in the treatment arm

Wigmore et al. 2000

Methods	clinical trial
Participants	26 patients
Interventions	EPA at 1 g/day for the first week, 2 g/day for the second week, 4 g/day for the third week, and 6 g/day thereafter.
Outcomes	overall survival, changes in weight, body composition, hematologic and clinical chemistry variables, acute- phase protein response, and performance status

Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	High risk	non-randomization
Allocation concealment (selection bias)	Unclear risk	non-randomization
Blinding of participants and personnel (performance bias)	High risk	open label
Blinding of outcome assessment (detection bias)	High risk	open label
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients
Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	26 patients in the study

Zuijdgeest-Van Leeuwen et al. 2000

Methods	double-blind, randomized trial
Participants	33 patients
Interventions	EPA-EE (6 g/d) or placebo (oleic acid (OA)-EE; 6 g/d) for seven days
Outcomes	whole-body lipolysis and palmitic acid release were measured in the overnight fasting state, changes in weight, plasma free fatty acids, triacylglycerols, CRP, albumin and prealbumin
Notes	

Risk of bias table

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	not specified
Allocation concealment (selection bias)	Low risk	random allocation
Blinding of participants and personnel (performance bias)	Low risk	double blind
Blinding of outcome assessment (detection bias)	Low risk	double blind
Incomplete outcome data (attrition bias)	Low risk	data is recorded for all patients

Selective reporting (reporting bias)	Low risk	all prespecified outcomes were reported
Other bias	High risk	17 patients in the treatment arm

Footnotes

Characteristics of excluded studies

Footnotes

Characteristics of studies awaiting classification

Footnotes

Characteristics of ongoing studies

Footnotes