Table S1. PubMed Search Strategy 12.04.2019.

Search	Query	Results
#10	#9 Filters: Publication date from 1999/04/10 to 2019/04/10	443
#9	#7 OR #8	650
#8	#5 AND #6	360
#7	#1 AND #2 AND #3 AND #4	440
#6	((("Enteral Nutrition)" [MeSH:NoExp]) OR "Parenteral Nutrition"[MeSH:NoExp]) OR "Parenteral Nutrition, Total"[MeSH:NoExp]	37188
#5	("Hyperglycemia" [MeSH]) OR ("Diabetes Mellitus" [MeSH])	415262
#4	(Blood glucose* OR Glycaemi* OR Glycemi* OR glucose control* OR glucose monitoring* OR glucose management* OR closed loop* OR closed-loop)	224471
#3	(Inpatient* OR "patients" [tiab] OR Hospitalization OR Hospitalisation OR hospitalized OR hospitalized)	5478370
#2	(hyperglycemia OR hyperglycaemia OR diabetic OR hyperglycemic)	292983
#1	(nutrition support* OR medical nutrition therap* OR artificial feeding* OR tube feeding* OR gastric feeding* OR enteral nutrition* OR parenteral nutrition* OR parenteral feeding* OR intravenous feeding* OR parenteral hyperalimentation*)	51508

Table S2. Embase Search Strategy 10.04.2019.

Search	Query	Results
#6	#5 AND [embase]/lim NOT ([embase]/lim AND [medline]/lim)	99
#5	#1 AND #2 AND #3 AND #4	238
#4	'glucose blood level'/exp OR 'blood glucose':ti,ab,kw OR 'glycaemi*':ti,ab,kw OR 'glycemi*':ti,ab,kw OR 'glucose control':ti,ab,kw OR 'glucose management':ti,ab,kw OR 'glucose monitoring':ti,ab,kw OR 'closed loop':ti,ab,kw OR 'closed-loop':ti,ab,kw	326057
#3	'hospital patient'/exp OR 'hospital patient':ti,ab,kw OR 'inpatient':ti,ab,kw OR 'hospitalisation':ti,ab,kw OR 'hospitalization':ti,ab,kw OR 'hospitalised':ti,ab,kw OR 'hospitalized':ti,ab,kw	481450
#2	'enteric feeding'/de OR 'enteric feeding':ti,ab,kw OR 'nose feeding'/de OR 'nose feeding':ti,ab,kw OR 'parenteral nutrition'/exp OR 'parenteral nutrition':ti,ab,kw OR 'nutrition supplement'/de OR 'nutrition support':ti,ab,kw OR 'medical nutrition therap*':ti,ab,kw OR 'artificial feeding':ti,ab,kw OR 'tube feeding':ti,ab,kw OR 'enteral nutrition':ti,ab,kw OR 'gastric feeding':ti,ab,kw OR 'parenteral nutrition'/de OR 'total parenteral nutrition'/de OR 'parenteral feeding':ti,ab,kw OR 'intravenous feeding':ti,ab,kw OR 'intragastric feeding':ti,ab,kw OR 'parenteral hyperalimentation':ti,ab,kw	84264
#1	'hyperglycemia'/de OR 'hyperglycemia':ti,ab,kw OR 'hyperglycaemia':ti,ab,kw OR 'hyperglucemia':ti,ab,kw OR 'diabetes mellitus'/de OR 'diabetes mellitus':ti,ab,kw OR diabetic:ti,ab,kw	863713

Table S3. Cochrane Central Register of Controlled Trials Search Strategy 10.04.2019.

Search	Query	Results
#15	Not listed in PubMed or Embase	62
#14	Filtered for years 1999-2019 and Trials	550
#13	#9 OR #12	774
#12	#10 AND #11	58
#11	#7 OR #8	27862
#10	#5 OR #6	2381
#9	#1 AND #2 AND #3 AND #4	756
#8	MeSH descriptor: [Diabetes Mellitus] explode all trees	26838
#7	MeSH descriptor: [Hyperglycemia] explode all trees	2602
#6	MeSH descriptor: [Hyperglycemia] explode all trees	760
#5	MeSH descriptor: [Enteral Nutrition] explode all trees	1713
#4	Blood glucose* OR Glycaemi* OR Glycemi* OR glucose control* OR glucose monitoring* OR glucose management* OR closed loop* OR closed-loop	62566
#3	(Inpatient* OR patients OR Hospitalization OR Hospitalisation OR hospitalized OR hospitalised)	824802
#2	(hyperglycemia OR hyperglycaemia OR diabetic OR hyperglycemic)	38420
#1	(nutrition support* OR medical nutrition therap* OR artificial feeding* OR tube feeding* OR gastric feeding* OR enteral nutrition* OR parenteral nutrition* OR parenteral feeding* OR intravenous feeding* OR parenteral hyperalimentation*)	30100

Table S4. ClinicalTrials.gov Search Strategy 10.04.2019.

Search	Query	Results
#1	Glucose AND (parenteral OR enteral Nutrition)	141

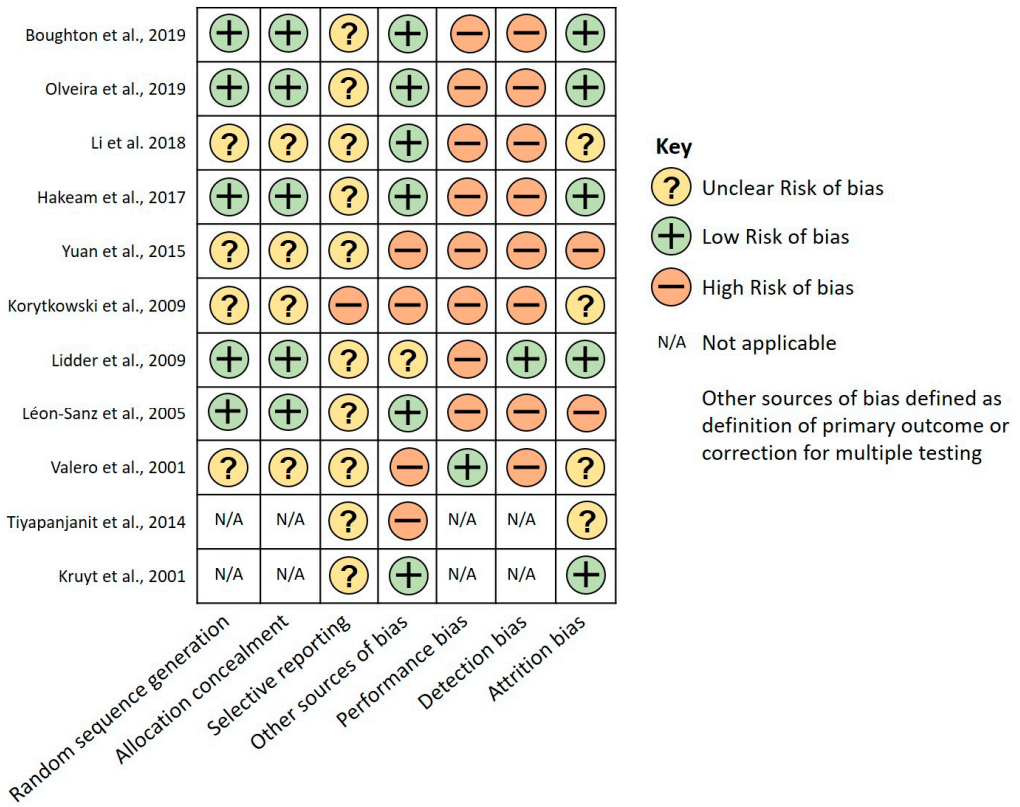

Figure S1. Quality assessment of clinical trials according to modified Cochrane Risk of Bias tool [30].

Table S5. PRISMA 2009 checklist [28].

Section/Topic	#	Checklist Item	Reported on Page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	1
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	1–3
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	3
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	3
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Supplementary Tables S1–S4
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	3–4
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	4
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	4
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	4
Section/topic	#	Checklist item	Reported on page #
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	N/A
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I2) for each meta-analysis.	N/A
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	5
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	4–5

Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	5–8
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Supplementary Figure S1
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Tables 1 and 2
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Supplementary Figure S1
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression).	N/A
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	12–13
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	12–13
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	13
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	14

Table S6. MOOSE checklist [29].

	Criteria	Brief Description of How the Criteria were Handled in the Systematic Review
	Reporting of Background should Include	
√	Problem definition	Hyperglycaemia is frequently encountered in patients receiving artificial nutrition, and optimal glucose management is challenging.
√	Hypothesis statement	None.
√	Description of study outcomes	Outcomes concerning glucose management such as mean glucose values.
√	Type of exposure or intervention used	Pharmacological or nutritional strategies used to manage hyperglycaemia.
√	Type of study designs used	We included clinical trials and observational studies comparing two different interventions.
√	Study population	Adult individuals from the general population with hyperglycaemia, with or without diabetes.
	Reporting of search strategy should include	
√	Qualifications of searchers	The credentials of the investigators are indicated in the authors list.
√	Search strategy, including time period included in the synthesis and keywords	Search strategy and time periods are described in page 3 of the manuscript and in Supplementary Tables S1–S4.
√	Databases and registries searched	Embase.com, PubMed, Cochrane Central Register of Controlled Clinical Trials and ClinicalTrials.gov
√	Search software used, name and version, including special features	We did not employ any search software. EndNote was used to merge retrieved citations.
√	Use of hand searching	We did not hand-search bibliographies of retrieved papers.
√	List of citations located and those excluded, including justifications	Details of the literature search and selection process are outlined in the flow chart on page 4. Citations for the included studies are enclosed in the Table 1 and 2. The citation list for excluded studies is available upon request.
√	Method of addressing articles published in languages other than English	We included records published or registered exclusively in English.
√	Method of handling abstracts and unpublished studies	Abstracts were excluded, unpublished studies were screened, one of them fit the inclusion criteria. Since there are no results available, this study was not included in Table 1 or Table 2.
√	Description of any contact with authors	None.
	Reporting of methods should include	
√	Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	Detailed inclusion and exclusion criteria are described in the Methods section.
√	Rationale for the selection and coding of data	Data extracted from each of the studies were relevant to the population characteristics, study design, glucose management strategy, sample size and primary outcome as well as main results deemed relevant.
√	Assessment of confounding	This review included clinical trials. Since retrospective publications have an inherently high risk of bias in confounding, we refrained them from a quality evaluation.
√	Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results	Clinical trials quality was assessed using the Cochrane risk of bias tool.
√	Assessment of heterogeneity	We did not perform any test of heterogeneity.
√	Description of statistical methods in sufficient detail to be replicated	We did not perform statistical analyses.
√	Provision of appropriate tables and graphics	We included 2 main tables.
	Reporting of results should include	
√	Graph summarizing individual study estimates and overall estimate	N/A
√	Table giving descriptive information for each study included	Table 1 and Table 2.
√	Results of sensitivity testing	N/A
√	Indication of statistical uncertainty of findings	N/A.

	Reporting of discussion should include	
√	Quantitative assessment of bias	We did not perform a quantitative assessment of bias.
√	Justification for exclusion	We excluded studies that did not compare the same exposure or outcome assessment in both groups.
√	Assessment of quality of included studies	Study quality was assessed using the Cochrane risk of bias tool. Retrospective studies were refrained from quality evaluation.
	Reporting of conclusions should include	
√	Consideration of alternative explanations for observed results	We discussed that multiple testing might be an alternative explanation for the observed outcomes, as not all studies corrected for this or defined primary outcome.
√	Generalization of the conclusions	The generalizability of our findings has been limited by the small sample sizes of the included trials. Also, the findings are not generalizable to children as the included trials only comprised the adult population.
√	Guidelines for future research	Future studies are required to determine the best management option for glucose control in larger populations.
√	Disclosure of funding source	No separate funding was necessary for the undertaking of this systematic review.