PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Line 2
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Line 24
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Lines 48-77
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Line 98
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Line 109
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Line133
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Line 138
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Line 151
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Line 157
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Line 109
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Line 157
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Line 164
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Line 181
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Line 174
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Line 174
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Line 174
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Line 174
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Line 174
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Line 174
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Line 170
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Line 195

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RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Line 227
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Line 237
Study characteristics	17	Cite each included study and present its characteristics.	Table 1
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Line 317
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Lines 227-277
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Lines 239-316
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Lines 239-316
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Lines 239-316
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Lines 239-316
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Line 288
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Line 288
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Lines 330-397
	23b	Discuss any limitations of the evidence included in the review.	Lines 330-397
	23c	Discuss any limitations of the review processes used.	Lines 330-397
	23d	Discuss implications of the results for practice, policy, and future research.	Lines 330-397
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Line 108
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Line 108
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Line 109
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Line 415
Competing interests	26	Declare any competing interests of review authors.	Line 425

Section and Topic	Item #	Checklist item	Location where item is reported
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	Line 424

From: [14] Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

Table S1: PRISMA 2020 Checklist

File S1: PRISMA 2020 checklist for this systematic review

The search strategy combined controlled vocabulary (MeSH and Emtree terms) and free-text keywords related to pain, pediatric populations, and non-invasive neuromodulation techniques. Boolean operators (AND/OR) were used consistently across databases.

The exact search strings were as follows:

PubMed/MEDLINE

('pain'/exp OR pain OR analgesia OR 'pain intensity')
AND
(child* OR adolescent* OR pediatric*)
AND
('transcutaneous electrical nerve stimulation'/exp OR TENS
OR 'auricular vagus nerve stimulation' OR taVNS
OR 'percutaneous electrical nerve field stimulation' OR PENFS
OR 'transcranial magnetic stimulation'/exp OR rTMS
OR 'transcranial direct current stimulation' OR tDCS
OR 'peripheral magnetic stimulation')
AND
('randomized controlled trial'/exp OR random*)

Embase (Emtree)

('pain'/exp OR pain OR analgesia OR 'pain intensity')
AND
(child* OR adolescent* OR pediatric*)
AND
('transcutaneous electrical nerve stimulation'/exp OR TENS
OR 'auricular vagus nerve stimulation' OR taVNS
OR 'percutaneous electrical nerve field stimulation' OR PENFS

OR 'transcranial magnetic stimulation'/exp OR rTMS
OR 'transcranial direct current stimulation' OR tDCS
OR 'peripheral magnetic stimulation')
AND
('randomized controlled trial'/exp OR random*)

Scopus / Web of Science / ScienceDirect
(pain OR analgesia OR "pain intensity" OR nociplastic)
AND
(child* OR adolescent* OR pediatric*)
AND
(TENS OR TEAS OR PENFS OR taVNS OR rTMS OR tDCS OR rPMS)
AND
(random* OR sham OR placebo)

Cochrane CENTRAL
(pain OR analgesia)
AND
(child* OR adolescent*)
AND
(TENS OR TEAS OR PENFS OR taVNS OR rTMS OR tDCS OR rPMS)