

AMSTAR Checklist
 Article Name:

AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or nonrandomised studies of healthcare interventions, or both

1. Did the research questions and inclusion criteria for the review include the components of PICO?

For Yes:	Optional (recommended)	
<input checked="" type="checkbox"/> Population	<input type="checkbox"/> Timeframe for follow up	<input checked="" type="checkbox"/> Yes
<input checked="" type="checkbox"/> Intervention		<input type="checkbox"/> No
<input checked="" type="checkbox"/> Comparator group		
<input checked="" type="checkbox"/> Outcome		

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?

For Partial Yes:	For Yes:	
The authors state that they had a written protocol or guide that included ALL the following:	As for partial yes, plus the protocol should be registered and should also have specified:	
<input checked="" type="checkbox"/> review question(s)	<input checked="" type="checkbox"/> a meta-analysis/synthesis plan, if appropriate, <i>and</i>	<input type="checkbox"/> Yes
<input checked="" type="checkbox"/> a search strategy	<input type="checkbox"/> a plan for investigating causes of heterogeneity	<input type="checkbox"/> Partial Yes
<input checked="" type="checkbox"/> inclusion/exclusion criteria	<input type="checkbox"/> a plan for investigating causes of heterogeneity	<input type="checkbox"/> No
<input checked="" type="checkbox"/> a risk of bias assessment		

3. Did the review authors explain their selection of the study designs for inclusion in the review?

For Yes, the review should satisfy ONE of the following:

<input checked="" type="checkbox"/> <i>Explanation for including only RCTs</i>	<input checked="" type="checkbox"/> Yes
<input type="checkbox"/> OR <i>Explanation for including only NRSI</i>	<input type="checkbox"/> No
<input type="checkbox"/> OR <i>Explanation for including both RCTs and NRSI</i>	

4. Did the review authors use a comprehensive literature search strategy?

For Partial Yes (all the following):	For Yes, should also have (all the following):	
<input checked="" type="checkbox"/> searched at least 2 databases (relevant to research question)	<input checked="" type="checkbox"/> searched the reference lists / bibliographies of included studies	<input checked="" type="checkbox"/> Yes
<input checked="" type="checkbox"/> provided key word and/or search strategy	<input checked="" type="checkbox"/> searched trial/study registries	<input type="checkbox"/> Partial Yes
<input checked="" type="checkbox"/> justified publication restrictions (e.g. language)	<input type="checkbox"/> included/consulted content experts in the field	<input type="checkbox"/> No
	<input checked="" type="checkbox"/> where relevant, searched for grey literature	
	<input checked="" type="checkbox"/> conducted search within 24 months of completion of the review	

5. Did the review authors perform study selection in duplicate?

For Yes, either ONE of the following:

<input checked="" type="checkbox"/> at least two reviewers independently agreed on selection of eligible studies and achieved consensus on which studies to include	<input checked="" type="checkbox"/> Yes
<input type="checkbox"/> OR two reviewers selected a sample of eligible studies <u>and</u> achieved good agreement (at least 80 percent), with the remainder selected by one reviewer.	<input type="checkbox"/> No

6. Did the review authors perform data extraction in duplicate?

For Yes, either ONE of the following:

<input checked="" type="checkbox"/> at least two reviewers achieved consensus on which data to extract from included studies	<input checked="" type="checkbox"/> Yes
<input type="checkbox"/> OR two reviewers extracted data from a sample of eligible studies <u>and</u> achieved good agreement (at least 80 percent), with the remainder extracted by one reviewer.	<input type="checkbox"/> No

7. Did the review authors provide a list of excluded studies and justify the exclusions?

For Partial Yes:

For Yes, must also have:

provided a list of all potentially relevant studies that were read in full-text form but excluded from the review

Justified the exclusion from the review of each potentially relevant study

Yes

Partial Yes

No

8. Did the review authors describe the included studies in adequate detail?

For Partial Yes (ALL the following):

For Yes, should also have ALL the following:

described populations

described population in detail

Yes

described interventions

described intervention in detail (including doses where relevant)

Partial Yes

described comparators

described comparator in detail (including doses where relevant)

No

described outcomes

described study's setting

described research designs

timeframe for follow-up

9. Did the review authors use a satisfactory technique for assessing the risk of bias (RoB) in individual studies that were included in the review?

RCTs

For Partial Yes, must have assessed RoB from

For Yes, must also have assessed RoB from:

unconcealed allocation, *and*

allocation sequence that was not truly random, *and*

Yes

lack of blinding of patients and assessors when assessing outcomes (unnecessary for objective outcomes such as all-cause mortality)

selection of the reported result from among multiple measurements or analyses of a specified outcome

Partial Yes

No

NRSI

Includes only NRSI

For Partial Yes, must have assessed RoB:

For Yes, must also have assessed RoB:

from confounding, *and*

methods used to ascertain exposures and outcomes, *and*

Yes

from selection bias

selection of the reported result from among multiple measurements or analyses of a specified outcome

Partial Yes

No

Includes only NRSI

10. Did the review authors report on the sources of funding for the studies included in the review?

For Yes

Must have reported on the sources of funding for individual studies included in the review. Note: Reporting that the reviewers looked for this information but it was not reported by study authors also qualifies

Yes

No

11. If meta-analysis was performed did the review authors use appropriate methods for statistical combination of results?

RCTs

For Yes:

The authors justified combining the data in a meta-analysis

Yes

AND they used an appropriate weighted technique to combine study results and adjusted for heterogeneity if present.

No

AND investigated the causes of any heterogeneity

No meta-analysis conducted

For NRSI

For Yes:

The authors justified combining the data in a meta-analysis

Yes

AND they used an appropriate weighted technique to combine study results, adjusting for heterogeneity if present

No

- AND they statistically combined effect estimates from NRSI that were adjusted for confounding, rather than combining raw data, or justified combining raw data when adjusted effect estimates were not available
- AND they reported separate summary estimates for RCTs and NRSI separately when both were included in the review
- No meta-analysis conducted

12. If meta-analysis was performed, did the review authors assess the potential impact of RoB in individual studies on the results of the meta-analysis or other evidence synthesis?

For Yes:

- included only low risk of bias RCTs
- OR, if the pooled estimate was based on RCTs and/or NRSI at variable RoB, the authors performed analyses to investigate possible impact of RoB on summary estimates of effect.
- Yes
- No
- No meta-analysis conducted

13. Did the review authors account for RoB in individual studies when interpreting/ discussing the results of the review?

For Yes:

- included only low risk of bias RCTs
- OR, if RCTs with moderate or high RoB, or NRSI were included the review provided a discussion of the likely impact of RoB on the results
- Yes
- No

14. Did the review authors provide a satisfactory explanation for, and discussion of, any heterogeneity observed in the results of the review?

For Yes:

- There was no significant heterogeneity in the results
- OR if heterogeneity was present the authors performed an investigation of sources of any heterogeneity in the results and discussed the impact of this on the results of the review
- Yes
- No

15. If they performed quantitative synthesis did the review authors carry out an adequate investigation of publication bias (small study bias) and discuss its likely impact on the results of the review?

For Yes:

- performed graphical or statistical tests for publication bias and discussed the likelihood and magnitude of impact of publication bias
- Yes
- No
- No meta-analysis conducted

16. Did the review authors report any potential sources of conflict of interest, including any funding they received for conducting the review?

For Yes:

- The authors reported no competing interests OR
- The authors described their funding sources and how they managed potential conflicts of interest
- Yes
- No

To cite this tool: Shea BJ, Reeves BC, Wells G, Thuku M, Hamel C, Moran J, Moher D, Tugwell P, Welch V, Kristjansson E, Henry DA. AMSTAR 2: a critical appraisal tool for systematic reviews that include randomised or non-randomised studies of healthcare interventions, or both. *BMJ*. 2017 Sep 21;358:j4008.