

# A Comparison of AMSTAR and ROBIS Tools for Methodological Quality Assessment of Systematic Reviews of Alzheimer's Disease

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## INTRODUCTION

- Alzheimer's disease (AD) is a chronic neurodegenerative disease affecting nearly 35 million people globally,<sup>1</sup> and as per the prediction of Alzheimer's Disease International, this count would rise up to 125 million by 2050.
- With the advancement in medical technologies, a vast literature on the AD is emerging rapidly, which is being collected, summarized and critically analyzed through systematic reviews (SRs).
- SRs are widely used for obtaining the "bottom line" in order to keep up with the literature, clinical guidelines and healthcare decisions.
- SRs are often considered the most reliable source of evidence to guide the decision-makers and evaluate the efficacy of a particular intervention.<sup>2</sup> However, the assessment of the quality of these SRs is very important as a substandard SRs can be misleading and harmful.
- In addition, the emerging evidence-based healthcare warrants the assessment of the quality of these large numbers of SRs to create good quality evidence.<sup>3</sup>
- A Measurement Tool to Assess systematic Review (AMSTAR) is widely used for the quality assessment of SRs,<sup>4</sup> while the Risk of Bias In Systematic reviews (ROBIS) tool was recently launched to specifically assess the risk of bias (RoB) in SRs.<sup>5</sup>

## WHAT IS AMSTAR?

- AMSTAR is one of the most acceptable and recommended tools for the quality assessment of SRs and meta-analysis.<sup>4</sup>
- The other subsidiary tools include National Institute for Health and Care Excellence checklists and the tools developed by Joanna Briggs Institute, Australia and Critical Appraisal Skill Programme, UK.<sup>4</sup>
- AMSTAR is an 11-item questionnaire that asks reviewers to answer 'yes', 'no', 'can't answer' or 'not applicable'.<sup>6</sup>

## WHAT IS ROBIS ?

- ROBIS is the first tool developed using a rigorous methodology that currently aims at four broad categories of reviews mainly within healthcare settings, i.e., interventions, diagnosis, prognosis and aetiology.<sup>5</sup>
- The tool can be processed in three different phases (I, II and III) as shown in Fig. 1

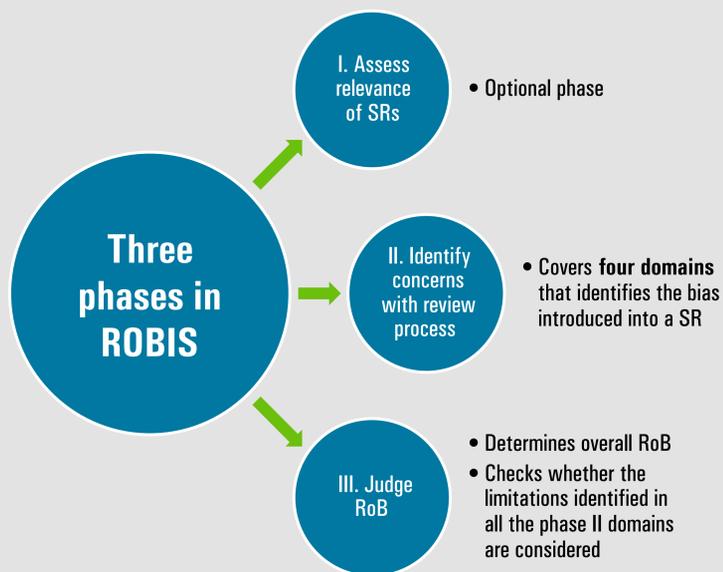


Fig. 1 Three different phases in ROBIS and their characteristics

- Signalling questionnaire is included in phase II domains (Fig. 2) and phase III helps to judge concerns with the review process and to assess the overall RoB in the review process, results and conclusion.
- The questionnaire asks reviewers to answer 'yes', 'probably yes', 'no information', 'probably no', or 'no'.

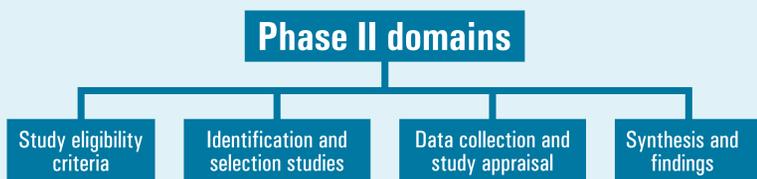


Fig. 2 Phase II domains of ROBIS tool

## OBJECTIVE

Comparing AMSTAR and ROBIS tools meticulously to determine the methodological quality of the included SRs published on the Alzheimer's Disease.

## METHODS

- PubMed was searched for relevant literature from inception until July 2017.
- The reference lists of the included studies were also hand-searched.
- All the reviews included investigations on AD patients receiving usual treatments, interventions to compare with placebo, or waitlist controls with cognitive function and behavioral outcomes.

## RESULTS

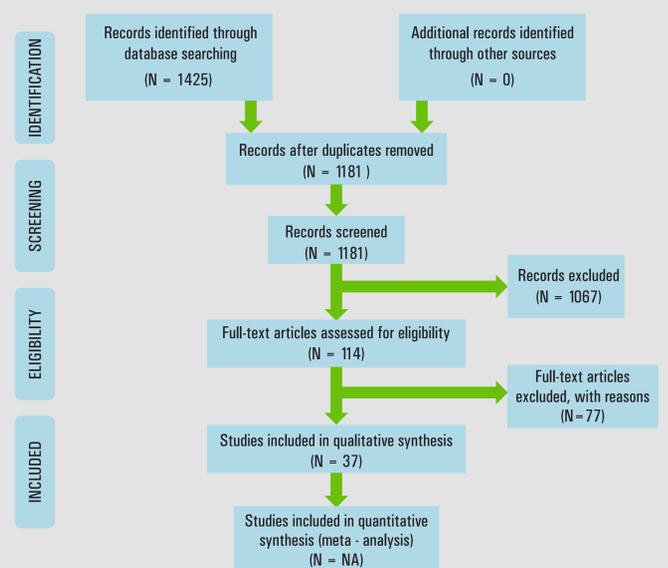
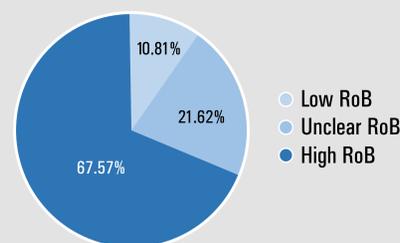


Fig. 3 PRISMA chart for inclusion of SRs in the current study

- A total of 37 SRs were identified that met our inclusion criteria.
- Using AMSTAR tool, 23 SRs scored between 9-10 indicating high quality, while only 7 SRs scored 6 indicating low quality of reviews.
- On the contrary, only 4 SRs were of high quality showing low RoB using ROBIS tool. Twenty five SRs were having high RoB, whereas the remaining 8 reviews belonged to unclear RoB category.
- The outcomes of methodological quality assessment of SRs on the AD using AMSTAR and ROBIS were dissimilar.

### Outcome of ROBIS'



### Outcome of AMSTAR'

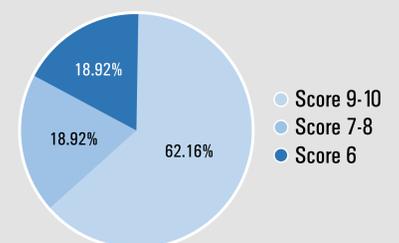


Fig. 4 Quality assessment of SRs on the AD using AMSTAR and ROBIS

## Interpretation of AMSTAR and ROBIS

### AMSTAR

- Ten out of 11-items in the questionnaire interpret the quality of SRs.
- The higher is the 'yes' score-count, the better is the quality of that SR.
- The score may range from 0-10.

### ROBIS

- ROBIS interprets the quality of SRs in a more complex way based on the response to the questionnaire (Fig. 5).
- The preference is given to high RoB > unclear RoB > low RoB during overall interpretation
- Even the presence of a single 'high RoB' in a domain/phase suggests that the complete domain/phase is at high RoB.

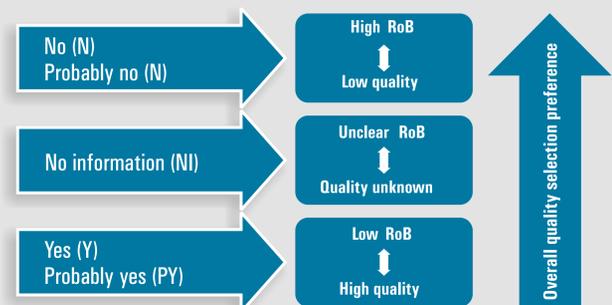


Fig. 5 Interpretation of responses to questionnaire in ROBIS

## DISCUSSION

- AMSTAR and ROBIS are frequently used to check for quality of Cochrane reviews, overviews, SRs and reviews that address questions of effectiveness that include randomised controlled trials.<sup>2,5</sup>
- However, AMSTAR does not cover some quality items, and each item is not weighted the same.<sup>2</sup>
- ROBIS is the first rigorously developed tool to assess the quality of SRs through RoB.<sup>5</sup>
- Generally, ROBIS assessment rates the Cochrane reviews better as the Cochrane reviews have more detailed information on the review methods which makes it easier to apply on ROBIS.<sup>6</sup>
- Difficulties in applying ROBIS are due to the limitations in reporting of reviews rather than difficulties in applying the tool itself.<sup>5</sup>

## CONCLUSION

- Our research suggests that ROBIS is more rigorous and reliable tool than AMSTAR in assessing the methodological quality of the included SRs.

## REFERENCES

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