

Mapping the characteristics of network meta-analyses on antithrombotic therapies: an overview

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INTRODUCTION

A large number of systematic reviews with network meta-analysis (NMAs) have evaluated the efficacy and safety of antithrombotics in cardiac disease, venous thrombosis, and cardiac surgery procedure^{1,2}. However, an updated synthesis of this evidence in order to support decision-making in clinical practice is not available in the literature.

OBJECTIVE

We aimed to map and critical appraise NMAs on antithrombotic therapies used as treatment or prophylaxis of cardiac diseases and cardiac surgical procedures.

METHODS

A systematic review of systematic reviews with meta-analysis was conducted following Cochrane Collaboration and Joanna Briggs recommendations (PROSPERO-CRD2020166468). Searches to identify NMAs meeting the eligibility criteria of this study were performed in PubMed and Scopus (Jan-2022). NMAs characteristics including metadata, statistical models' description and main pooled results were collected. The methodological quality of NMAs was evaluated using PRISMA-NMA checklist and AMSTAR-2 tools. Descriptive statistical analyses with categorical variables reported as frequencies and continuous variables as median and interquartile range (IQR) were performed (SPSS-v.25.0).

RESULTS

Overall, n=88 NMAs published between 2007-2022 were identified - **Figure 1**. The most evaluated clinical condition was atrial fibrillation (n=57; 64.8%); around one third of studies (38.6%) assessed cardiac surgical procedures. **Table 1** depicts the characteristics of the evaluated NMA. Fifty NMAs (56.8%) were published by authors from one single country being China the most frequent. Only 28.4% NMAs had a registered study protocol. A median of 14 primary studies (IQR 5-20.75) (mostly randomized clinical trials) were included per NMA. A median of 40 (IQR 24-84.25) indirect meta-analyses per study was found. At least one network diagram for a given outcome was provided by 68 (77.2%) studies, yet only 22 (25.6%) performed a treatment ranking analyses. Conflict of interest declarations and study's funding were informed by 34 (38.6%) and 38(43.2%) NMAs, respectively. **Figures 2 and 3** present the pilot methodological quality results (n=60 evaluated studies) - PRISMA-NMA and AMSTAR-2.

RESULTS

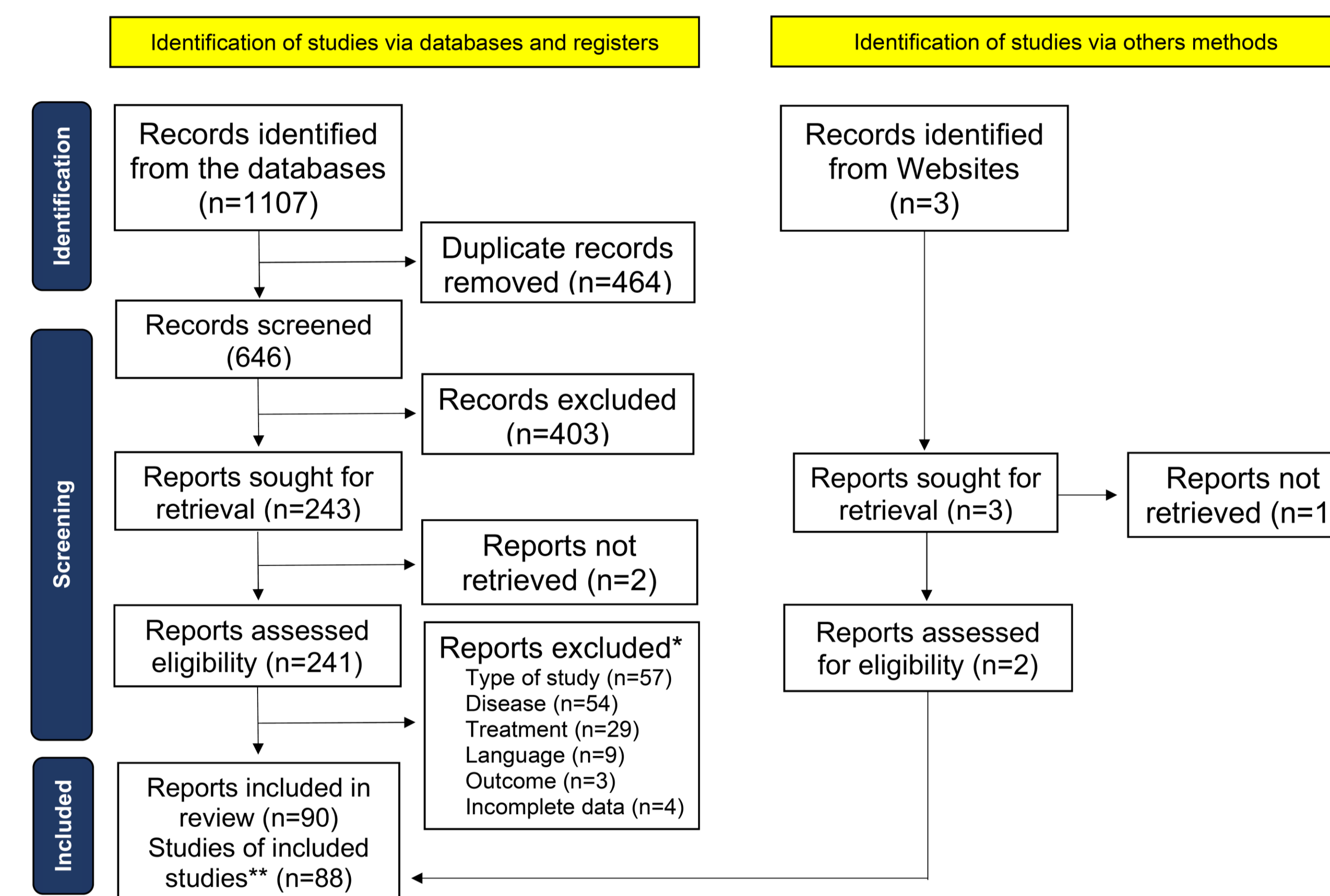


Figure 1. Flowchart of the systematic review (n=88 studies selected for evaluation)

*Total of 153 registers excluded (registers could be excluded by more than one reason). **Two studies updated their results in later publications; the most recent register was considered for data extraction

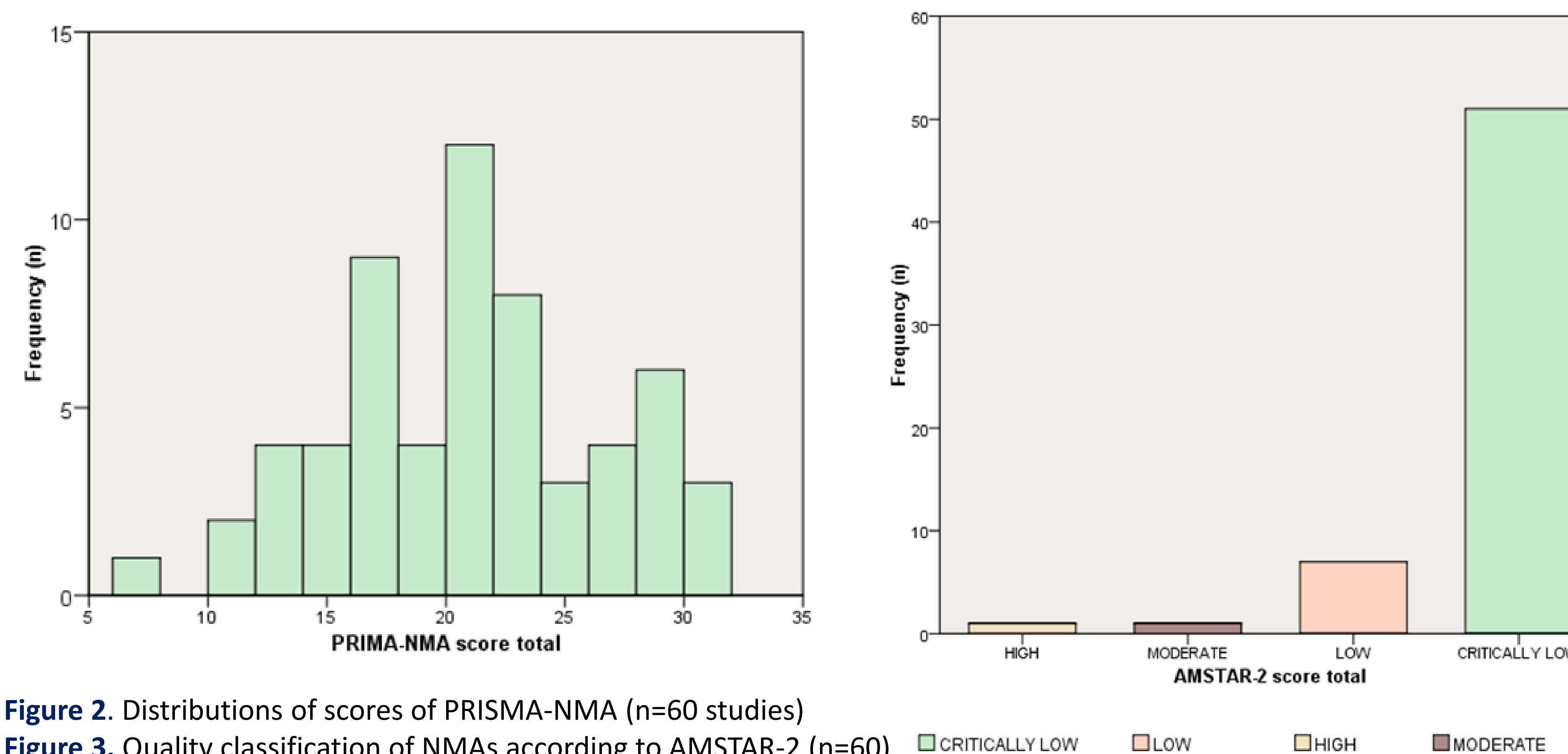


Figure 2. Distributions of scores of PRISMA-NMA (n=60 studies)

Figure 3. Quality classification of NMAs according to AMSTAR-2 (n=60)

Table 1. Overall characteristics of the NMA on antithrombotic therapy

Characteristics (N=88)	N (%)
International collaboration	
Yes	38 (43.2)
No	50 (56.8)
Most productive countries (number of publications)	
China	25 (28.4)
USA	22 (25.0)
Italy	6 (6.8)
Protocol register (PROSPERO or other)	
Yes	25 (28.4)
No	63 (71.6)
Cardiac surgical procedures	
Yes	34 (38.6)
No	54 (61.4)
Clinical condition	
Atrial fibrillation	57 (64.8)
Acute coronary syndromes	15 (17.5)
Surgical cardiac	13 (14.8)
Number of primary studies (median – IQR)	
	14 (5.0 – 20.75)
Primary study design	
Randomized controlled trials	65 (73.9)
Observational studies	6 (80.7)
Both	17 (19.3)
Number of indirect comparisons (median – IQR)	
	40 (24.0 – 84.25)
Presents a network diagram	
Yes	68 (77.9)
No	20 (22.7)
Performed ranking or SUCRA analysis	
Yes	22 (25.0)
No	66 (75.0)
Conflict of interest	
Yes	34 (38.6)
No	50 (56.8)
Not reported	4 (4.5)
Financial support	
Yes	38 (43.2)
No	21 (23.9)
Not reported	29 (33.0)

IQR: interquartile range (25-75); SUCRA: surface under the cumulative curve analysis

CONCLUSIONS

Although there is a wide spread of NMA-type studies assessing different antithrombotic agents for different cardiac conditions, the lack of standardized conduction and reporting of NMAs (poor-moderate methodological quality) may limit their comparison and results implementation into clinical practice.

REFERENCES

[1] Tonin FS et al. Int J Epidemiol. 2019 Apr 1;48(2):620-632; [2] Li T et al. Adv Exp Med Biol. 2020;1177:101-131