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ORIGINAL RESEARCH

Including conference abstracts rarely changed systematic review conclusions: a case study from a living network meta-analysis of COVID-19 treatments

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Abstract

Background and Objectives: Including conference abstracts (CAs) in systematic reviews (SRs) helps reduce publication bias but raises concerns about reporting quality and reliability. While discrepancies with full publications are known, excluding CAs may overlook relevant early evidence. To evaluate the reporting quality of CAs, their consistency with full-text publications, and the impact of including them on effect estimates and the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) framework in a living systematic review and network meta-analysis (SRNMA) of COVID-19 drug treatments.

Study Design and Setting: We conducted a retrospective methodological study of all CAs included in the COVID-19 SRNMA until May 19, 2024. We assessed trial characteristics, reporting quality using Consolidated Standards of Reporting Trials (CONSORT)-A, and consistency with full-text publications. We also compared meta-analyses with and without CAs at predefined time points for mortality and hospital length of stay, evaluating changes in effect and GRADE domains.

Results: We included 105 CAs; 53% (56/105) were linked to a full publication. Only 7% met high reporting standards. Average consistency with full-text publications across key methodological items was 67.6%, often due to missing details in both sources. CAs enabled meta-analyses that would not have been possible at 14% of time points. Their inclusion did not affect conclusions when using the null threshold but changed the effect estimate in 55.6% and imprecision ratings in 16% of cases when using minimally important differences (MIDs). In a few instances, CAs also influenced risk of bias and inconsistency assessments.

Conclusion: CAs can fill evidence gaps when data are limited or emerging. Although they rarely change conclusions based on the null threshold, their inclusion has a greater impact when using MID. Reviewers should assess their inclusion case by case and promote better reporting practices to enhance their contribution to SRs.

Keywords: Evidence synthesis; CA; Reporting quality

1. Introduction

Systematic reviews (SRs) summarize all available evidence to answer relevant clinical questions [1−3]. The inclusion of conference abstracts (CAs) is highly desirable to minimize the risk of publication bias in SRs [4]. Inadequate reporting of methodology in gray literature might, however, reduce the credibility of the evidence included

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What is new?

Key findings

- Fewer than 10% of CAs met high CONSORT-A standards, indicating persistently low reporting quality.
- Consistency between CAs and full publications was generally moderate to high, often due to missing information in both.
- CAs can help fill evidence gaps when data are limited or emerging, but their inclusion rarely changed SR conclusions.

What this adds to what is known?

- To our knowledge, this is the first study to jointly assess CA reporting quality, consistency with full publications, and their impact on effect estimates and GRADE domains.

What is the implication and what should change now?

- Reporting quality must improve to make CAs more reliable for evidence synthesis.
- Reviewers should evaluate the inclusion of CAs on a case-by-case basis, especially when the certainty of evidence is low or very low, or in emerging research areas.
- There is no universally right or wrong approach, but reviewers should carefully assess, discuss, and justify their decision based on the context.
- Linking CAs to full-text publications is essential to avoid data duplication. Key details, such as trial registration, trial status, and author contact, must be reported.

[5−8]. Although in 2008, the Consolidated Standards of Reporting Trials (CONSORT) statement published an extension to improve the quality of the reports of CAs [9], researchers observed only 24% adherence more than 10 years later [7].

The value of including a CA in an SR remains a trade-off. The reliability of their results has been questioned because of discrepancies between CAs and final publications [10,11]. On the other hand, CAs with "positive" results are more likely to be published as full articles; therefore, excluding CAs may increase the risk of publication bias [6].

Authors reported that approximately 68% of randomized controlled trials (RCTs) first presented as CAs become full publications within the next 10 years after a presentation [6]. In 2009, the median time to publication was 21 months (range: 13-32) [12]. This makes it challenging to decide whether to wait for the full text or use data from the CAs.

Understanding the reporting quality of CAs, their consistency with final publications, and their impact on SR conclusions has important implications. This study addresses these questions in the context of living SR and network meta-analyses (SRNMA) of drug treatments for COVID-19, with the following objectives:

1. To evaluate the compliance of CAs with reporting standards.
2. To evaluate consistency between the reported key methods in the CAs and the final publication.
3. To evaluate the impact of including CAs on effect and the certainty of evidence (CoE) of a SR.

2. Methods

We retrospectively reviewed the CAs included in a living SRNMA of treatments for COVID-19 launched in July 2020 [13−15].

We describe methods specific to this substudy. Details of the SRNMA project—such as search strategies, data extraction, and analysis procedures—are available in the main publication [13−15] and Appendix 1. Additional methodological details on our approach are available in Appendix 2.

2.1. Search

This study used the search strategy of the SRNMAs of COVID-19. See Appendix 3.

2.2. Eligibility criteria and abstracts selection

The SRNMAs include RCTs comparing drug treatments with placebo, standard care, or each other in patients with COVID-19, regardless of publication status. Study selection follows standard SR methods. For this study, we included the trials published as CAs up to May 19, 2024.

We did not apply restrictions based on the language of publication.

2.3. Identification of full-text publications associated with CAs

When possible, we linked CAs to full-text publications using trial registration numbers, author names, treatments, trial names, and recruitment periods. We contacted trial authors when the linkage was unclear.

2.4. Data collection

We used data from the SRNMA database when available, and pairs of reviewers extracted additional data as needed. We provide details below.

2.4.1. All CAs: characteristics and adherence to reporting standards

We collected information on trial characteristics, including year of publication, number of patients enrolled, country, setting, trial registration, and trial status.

To evaluate the compliance with reporting standards, we used the CONSORT extension for CAs (CONSORT-A) [9], a checklist with 17 items. We divided two double-barreled items into separate items and evaluated 19 items. We split the item ''participants'' into participant criteria and setting criteria, and the item ''outcome'' into results by group and effect size with precision.

We extracted outcomes reported in the CAs to identify the most frequently reported ones.

2.4.2. CAs with linked full-text publication: key methods aspects

To evaluate consistency between CAs and full texts, we extracted key methodological aspects relevant to risk of bias: randomization, allocation concealment, balance of co-interventions, follow-up completeness, blinding, and analysis according to a prespecified plan. These were selected based on CONSORT-A standards and our prior work on preprints [16].

2.4.3. All trials: risk of bias and outcome data

We used risk of bias assessments and outcome data from the living SRNMA only for interventions deemed of interest by a panel of clinicians (see Appendix 4 for the full list of drugs) and for those where at least one CA reported results. We focused on the two most frequently reported outcomes—one dichotomous (mortality) and one continuous (length of hospital stay [LoS]). For LoS, we used the sample size, central tendency, and dispersion; for mortality, the number of participants and events per trial arm.

2.5. Data synthesis and analysis

2.5.1. Objective 1 (reporting quality of CAs)

We described the general characteristics of the trials reported in the CAs. Additionally, we calculated reporting compliance as the percentage of CONSORT-A items reported out of the total and categorized it as very low (0%−25%), low (26%−50%), moderate (51%−75%), and high (more than 75%). We also reported the proportion of compliance with each CONSORT-A item across trials.

2.5.2. Objective 2 (discrepancies in key methods)

For each key methodological aspect, we assessed whether reporting was consistent or inconsistent between the CA and full-text publication. For consistent cases, we determined whether the method remained unchanged or was not reported in both sources. For inconsistent cases, we classified them as discrepant reporting or additional information provided. We reported the proportion of trials in each of these four categories.

2.5.3. Objective 3 (impact of including CAs in conclusions)

We assessed the impact of including CAs on effect estimates and Grading of Recommendations, Assessment, Development and Evaluations (GRADE) certainty for mortality and LoS. To reflect different time frames, we conducted meta-analyses at 6, 12, 24, and >24 months after the first journal publication on each drug. At time points with available abstracts, we ran two pairwise frequentist meta-analyses comparing the drug to standard care—with and without the CAs. We did not conduct a new meta-analysis when no additional studies were available since the previous time point.

We used a random-effects model with inverse variance weighting, applying risk ratios (RRs) or risk differences (RDs) for mortality, and mean differences (MDs) for LoS. For absolute mortality effects, we used baseline risks from control groups in the included trials.

We classified effects as trivial, beneficial (favoring the intervention), or harmful (favoring the control group) using two targets of certainty: (1) a nonzero effect, with the null as a threshold, and (2) an important difference, with the minimally important difference (MID) as the threshold. We used the SRNMA-defined MID [13]: 10 per 1000 for mortality and 1 day for LoS. Effects within these thresholds were classified as trivial; those beyond were considered beneficial or harmful based on direction. Reductions in mortality or LoS indicated benefit, while increases indicated harm. We then compared analyses with and without CAs and reported the proportion of cases where classifications changed or remained the same. See Figure 1.

GRADE assesses the CoE across five domains, including risk of bias, imprecision, and inconsistency. Because adding a CA can increase sample size and narrow confidence intervals, we first evaluated its impact on imprecision—rated as no serious, serious, or very serious—using the null and MID thresholds. We compared judgments in meta-analyses with and without the abstract (see Fig 1). When a CA changed imprecision, we also assessed its effect on risk of bias and inconsistency.

3. Results

3.1. Identification of the CAs, comparisons, and time points for analysis

The flowchart in Figure 2 illustrates the search and selection of CAs included in the analyses for each objective.

3.2. Characteristics of the CAs

Of the total CAs, 53% (56/105) were linked to a full-text publication, 40% (42/105) were unique records, and 7% (7/105) were multiple CAs from the same study. In addition, 55% (57/105) did not report trial status, and 69% (72/

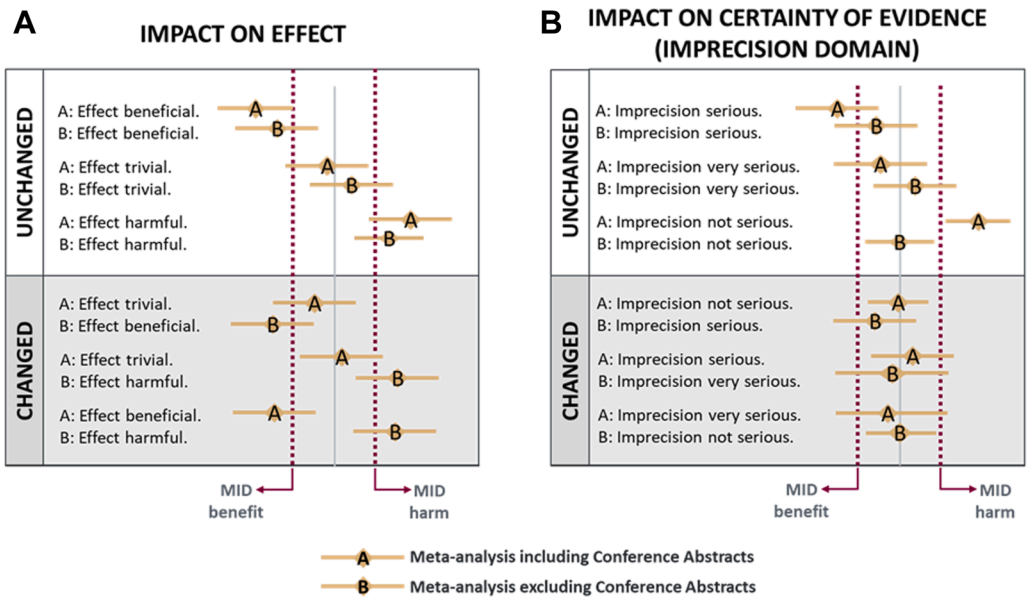

Figure 1. Impact of including CAs in systematic reviews on effect and certainty of evidence (imprecision domain), A, Impact on effect. B, Impact on imprecision. CAs, conference abstracts; MID, minimally important difference.

105) focused on hospitalized patients. Table 1 presents details on study setting and trial status.

Sixty-eight percent (71/105) of the CAs assessed the effect of a drug considered of interest. Among them, mortality was the most frequently reported outcome in 54.9% (39/71), while viral clearance was the least reported, mentioned in only 3 CAs. Among CAs that stated they would evaluate a specific outcome, an average of 79.8% provided data usable for meta-analysis. See Table 2 for more details.

3.3. Objective 1: quality of reporting in CAs

Considering the 19 CONSORT-A items, the median compliance score was 10.6 (range: 5 to 17). Overall compliance was rated as high in 7% (7/105) of the CAs, moderate in 63% (66/105), low in 30% (31/105), and very low in 1% (1/105). In other words, 70% (73/105) of the CAs reported adequately between 51% and 100% of the criteria.

The reporting quality of CAs varied across different CONSORT-A checklist items. While most CAs mentioned randomization, only 6% (6/105) detailed how it was implemented. Population and intervention characteristics, objectives, main outcomes, and blinding were frequently reported. Conversely, 10% (11/105) included author contact information, 20% (21/105) described the trial design, and only about a third (34/105) reported trial registration. Recruitment details and funding disclosures were also infrequent (Fig 3).

3.4. Objective 2: consistency of reported key methods

Across the key methods, the average consistency in reporting between CAs and full-text publications was 67.6%. Randomization was highly consistent, as most CAs included general statements sufficient to infer proper randomization. Blinding of participants, personnel, and third-party evaluators also showed high consistency (91% [51/56], 93% [53/56], and 77% [43/56], respectively); however, much of this consistency stemmed from missing information in both sources.

Most inconsistencies arose from additional details in the full-text publication, particularly on allocation concealment and loss to follow-up. Table 3 provides details.

3.5. Objective 3: impact of including CAs on effect and CoE

For mortality, a CA was the sole evidence source in 12% of time points (2/17), enabling a meta-analysis that would not have been possible otherwise.

Using the null, the effect remained unchanged in 100% of cases (15/15), while using the MID, including CAs changed the effect from beneficial to trivial in 19% of cases (3/15) and from trivial to beneficial in 40% of cases (6/15).

When using the null, including CAs changed imprecision judgments from very serious to not serious in 6.3% of cases (1/16). When using the MID, the judgment changed from very serious to serious in 12.5% of cases (2/16). CAs did not affect risk of bias and had minimal impact on inconsistency (1/17) (Appendixes 5-6).

For LoS, a CA was the sole evidence source in 25% of time points (1/4), enabling a meta-analysis that would not have been possible otherwise.

Using the null, the effect shifted from harmful to beneficial in 33.3% (1/3). When using the MID, the effect changed from harmful to trivial in 33.3% (1/3) of cases.

When using the null, including at least one CA did not impact imprecision judgments, while using the MID, the

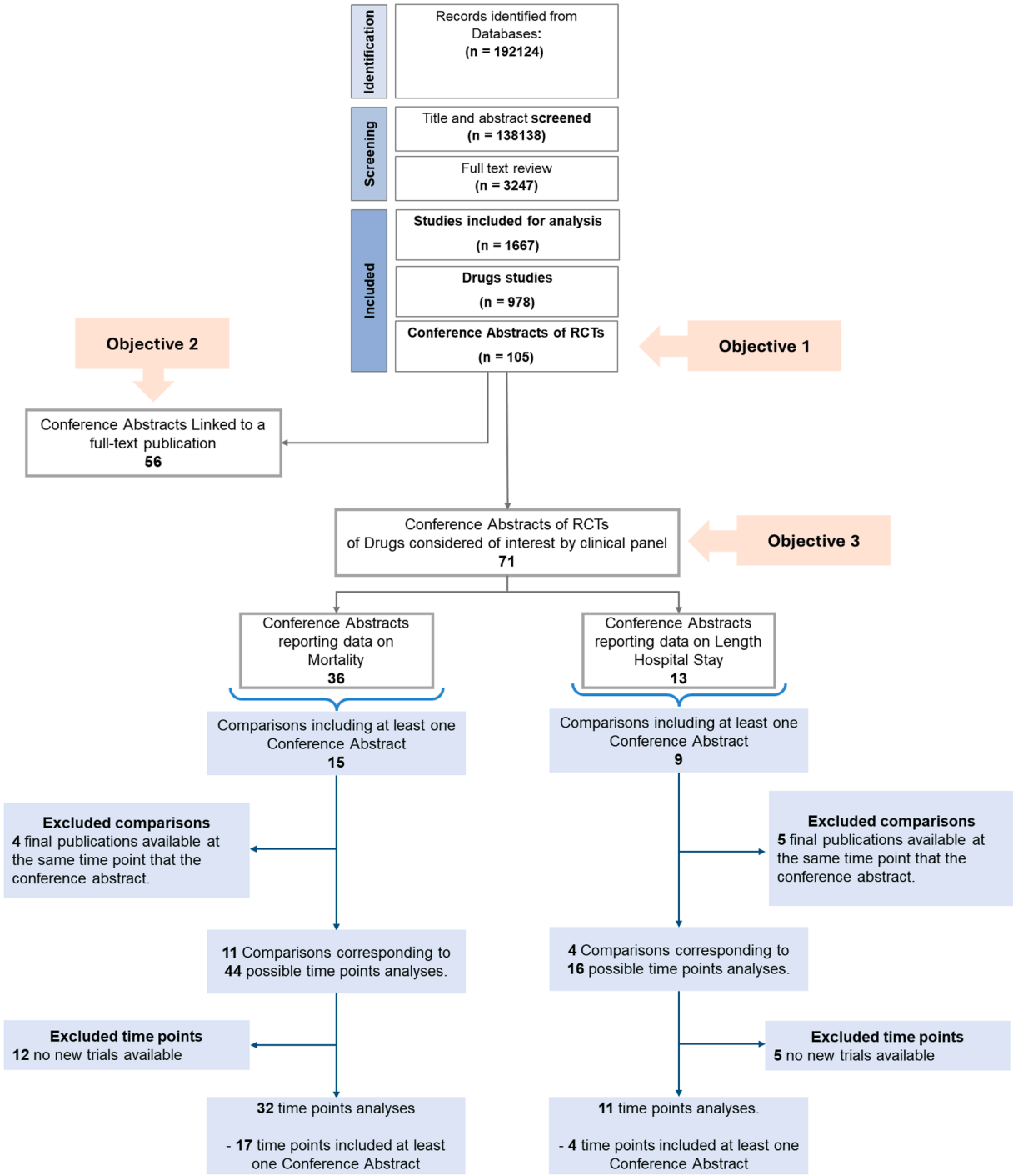

Figure 2. Flowchart, CAs included in the analyses for each objective. CAs, conference abstracts; RCTs, randomized controlled trials.

judgment changed from serious to very serious in 33.3% of cases (1/3). Including a CA changed both risk of bias and the inconsistency judgment from not serious to serious at this time point. At the other three time points (3/4), it had no effect on either domain (Appendixes 7-8).

Overall, the impact on CoE was minimal: out of 21 analyses, inclusion of CAs would have led to rating up by one level in 4.8% (1/21) and down by two levels in 4.8% (1/21). Using the MID, inclusion would have led to rating up by one level in 9.5% (2/21), down by one level in 4.8% (1/21), and down by two levels in 4.8% (1/21) (Appendix 9). CAs that changed the effect or imprecision judgment tended to have greater weight in the meta-analysis and contributed a higher proportion of patients and events

Table 1. Characteristics of the CAs

Study characteristic	Summary statistic
Number of patients enrolled, median, (IQR)	180 (70.5–385)
Trial status	
Ongoing trial, % (n/N)	13% (14/105)
Finished trial, % (n/N)	31% (33/105)
Not specified, % (n/N)	55% (58/105)
Study setting	
Inpatient, % (n/N)	68.6% (72/105)
Outpatient, % (n/N)	18,1% (19/105)
Mixed, % (n/N)	2% (2/105)
Not specified, % (n/N)	11.3% (12/105)

CAs, conference abstracts; IQR, interquartile range.

compared to those that did not change the results (Appendix 10).

4. Discussion

4.1. Main findings

We found moderate adherence to CONSORT-A guidelines in CAs, with only 7% meeting high reporting standards. Consistency between abstracts and full-text publications was moderate to high, though true agreement is uncertain, as both often lacked details on the same items.

CAs were the only evidence in 14% of time points (3/21), enabling meta-analyses that would not have been possible otherwise. Including CAs changed the effect in 6% and imprecision in 5% of cases using the null. With MID, the effect changed in 55.6% and imprecision in 16% of cases. Additionally, their inclusion in meta-analyses had minimal impact on risk of bias (1/21) and affected inconsistency in 9.5% of cases (2/21).

4.2. Implications

Our findings are relevant for systematic reviewers and guideline developers deciding whether to include CAs in evidence synthesis. They are also important for clinical trial researchers, editors, and scientific committees, as they need to recognize the importance of accurate and comprehensive reporting to ensure their usefulness in evidence synthesis. For example, strict word limits (typically 250–300 words) may hinder adequate detail, limiting their usefulness.

The decision to include CAs may differ depending on the context, requiring a case-by-case judgment. For instance, we included them in the COVID-19 SRNMA to address an urgent public health need and inform clinical practice recommendations. We acknowledged that the rapid pace of research during the pandemic meant that perhaps not all studies were published as full texts in time, with some only being disseminated through conferences. In this context, we deemed the additional effort worthwhile.

We encourage evidence synthesis developers to consider context and the following factors when deciding on including CAs. In emerging fields, where evidence is still developing, CAs can sometimes fill gaps (14%) when full-text publications are unavailable, and when this is the case reviewers should make use of them. Conversely, when the volume of data contributed by CAs is low, reflected in a small proportion of patients, meta-analysis weight, or events, their added value to the meta-analysis may be limited. Such instances are easily identified when abstracts add only a relatively small proportion of evidence. Second, CAs may be more valuable when the CoE is low or very low. In these situations, evidence is already limited or uncertain, and the inclusion of even small additional data can influence judgments about key GRADE domains. We found that including CAs changed imprecision ratings in 12.5% of cases for mortality and 33% for LoS when using

Table 2. Outcomes reported in CAs of drugs of interest: frequency and proportion with data usable for meta-analysis

Outcome	Outcome mentioned in the objective	Results reported by arm	Estimated effect reported	Rate of usable data for meta-analysis[a]
Mortality, % (n/N)	56.3% (39/71)	48.9% (34/71)	18.3% (13/71)	92.3% (36/39)
Mechanical ventilation, % (n/N)	26.8% (19/71)	18.9% (13/71)	8.5% (6/71)	68.4% (13/19)
Adverse events, % (n/N)	22.5% (16/71)	16.9% (12/71)	7% (5/71)	75% (12/16)
Admission to hospital, % (n/N)	8.5% (6/71)	7% (5/71)	0% (0/71)	83.3% (5/6)
Viral clearance, % (n/N)	4.2% (3/71)	4.2% (3/71)	0% (0/71)	100% (3/3)
Hospital length of stay, % (n/N)	23.9% (17/71)	18.3% (13/71)	1.4% (1/71)	76.5% (13/17)
Length of stay in ICU, % (n/N)	4.2% (3/71)	2.8% (2/71)	0% (0/71)	100% (3/3)
Duration of mechanical ventilation, % (n/N)	5.6% (4/71)	1.4% (1/71)	0% (0/71)	25% (1/4)
Time to symptom resolution, % (n/N)	21.1% (15/71)	12.7% (9/71)	8.5% (6/71)	80% (12/15)
Days free from MV, % (n/N)	7% (5/71)	5.6% (4/71)	1.4% (1/71)	80% (4/5)
Time to viral clearance, % (n/N)	2.8% (2/71)	2.8% (2/71)	1.4% (1/71)	100% (2/2)

CAs, conference abstracts; ICU, intensive care unit; MV, mechanical ventilation.

[a] Percentage of CAs that provided data usable for a meta-analysis among those reporting the outcome.

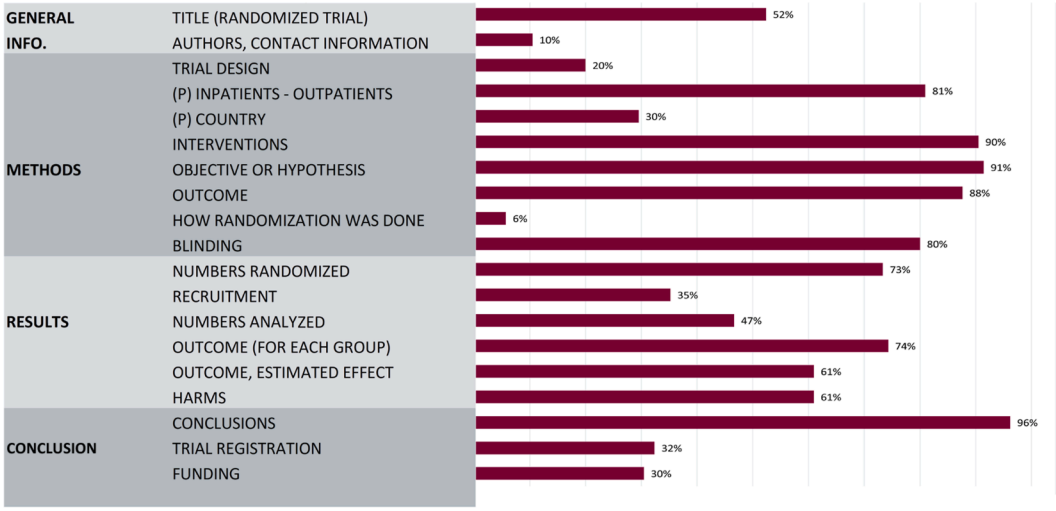

Figure 3. Percentage of compliance with each CONSORT-A items. CONSORT, Consolidated Standards of Reporting Trials.

the MID. Third, when the decision is particularly challenging, conducting sensitivity analyses excluding CAs can provide useful insight to explore their impact in specific contexts. Finally, when reviewers choose to include CAs, they should implement mechanisms to link them with full-text publications to prevent data duplication. Reviewers should transparently report when and how they include or exclude CAs and clarify under what conditions those decisions may change as new information emerges.

To implement these suggestions and given the resource-intensive nature of including CAs, a practical approach might be to label CAs as such during the inclusion stage. Then, revisit or transition them to the data extraction phase once you have a clearer view of the body of evidence from full-text publications.

Clinical trial authors and scientific committees should promote proper reporting aligned with journal standards. Including key details—such as author contact, trial names, and registration numbers—helps prevent data duplication and strengthens the contribution of CAs to the body of evidence. Our findings show that 53% of the CAs were linked to full-text publications, highlighting the importance of establishing clear connections between formats. Moreover, among the CAs that stated they would evaluate a specific outcome, 79.8% provided data usable for meta-analysis. This highlights how complete and accurate reporting supports better risk of bias assessment and strengthens the value of CAs in evidence synthesis.

4.3. Relation of the study's findings to previous work

Our findings align with previous research on the trade-offs of including CAs in SRs. Reporting quality using CONSORT-A has improved compared with earlier reports

Table 3. Consistency of reported key methods

Key methods aspect that might affect the assessment of risk of bias	Inconsistent reporting			Consistent reporting		
	% (n/N)	Discrepant reporting % (n/N)	Additional reporting % (n/N)	% (n/N)	Unchanged % (n/N)	Unchanged, NR % (n/N)
Randomization	0% (0/56)	0% (0/56)	0% (0/56)	100% (56/56)	100% (56/56)	0% (0/56)
Concealment	64% (36/56)	0% (0/56)	64% (36/56)	36% (20/56)	2% (1/56)	34% (19/56)
Cointerventions at the time of randomization	48% (27/56)	0% (0/56)	48% (27/56)	51% (29/56)	5% (3/56)	46 (26/56)
Follow-up	69% (39/56)	5% (3/56)	64% (36/56)	30% (17/56)	30% (17/56)	0% (0/56)
Blinding-general statement	20% (11/56)	4% (2/56)	16% (9/56)	81% (45/56)	79% (44/56)	2% (1/56)
Blinding of participants	0% (0/56)	0% (0/56)	9% (5/56)	91% (51/56)	91% (51/56)	0% (0/56)
Blinding personnel	7% (4/56)	0% (0/56)	7% (4/56)	93% (52/56)	91% (51/56)	2% (1/56)
Blinding of third-party evaluator	23% (13/56)	0% (0/56)	23% (13/56)	77% (43/56)	30% (17/56)	46% (26/56)
Results analyzed and reported according to a prespecified plan	50% (28/56)	4% (2/56)	46% (26/56)	50% (28/56)	43% (24/56)	7% (4/56)

[7,10]. Still, key items, such as status of the trial, trial registration, and random sequence generation and allocation concealment, remain poorly reported, limiting their utility in SRs [17]. Although average time to publication is around 10 years, our 3-year follow-up found that nearly 60% of CAs had been published as full texts [18]. This high rate may reflect the accelerated publication and review processes during the COVID-19 pandemic [19].

Consistent with earlier studies, we observed moderate to high consistency between CAs and full-text publications, particularly regarding reporting on randomization and blinding [20].

Regarding the impact of including CAs on pooled effect estimates, our findings align with previous studies. While including CAs is valuable for capturing emerging evidence, in the context of COVID-19, their inclusion only impact on effect when using the MID as the threshold, shifting the effect from beneficial to trivial in some cases and from trivial to beneficial in others. This is consistent with previous research, which suggests that the exclusion of unpublished or gray literature typically has only a small impact on the pooled estimates of treatment effects in SRs [17,21].

4.4. Strengths and limitations of the study

Our study benefits from a comprehensive search strategy and included both CAs and full-text COVID-19 papers. While prior research examined reporting quality, consistency, or impact separately, our integrated approach offers a more complete view to inform decisions on including CAs in SRs.

Although conducting this study during the COVID-19 pandemic was a strength because of the high volume of CAs relative to full-text publications, the relatively small sample size and pandemic-specific context may limit the generalizability of our findings.

The impact of the pandemic on research processes, including the quality and quantity of studies and the motivation for presenting results at conferences, is not fully understood [22,23]. The transition to online conference formats may have changed how research is disseminated and evaluated [23,24]. Additionally, the urgency of the pandemic likely led to faster study conduct and less comprehensive reporting [19,25], potentially affecting CA quality. How these factors differ from other research contexts remains unclear.

These limitations present opportunities to explore how similar factors affect evidence synthesis in non-COVID-19 contexts.

5. Conclusion

Systematic reviewers must carefully consider the value of including CAs in SRs. When there is limited or emerging evidence, CAs can help fill gaps, though their inclusion may not impact the conclusions of SRs when using the null. However, changes are more likely when applying MID, which are commonly used in evidence synthesis for guidelines. Researchers should strive for better adherence to reporting standards and provide more detailed data to enhance evidence synthesis. Ultimately, there is no one-size-fits-all answer to including CAs; researchers should recognize the complexities involved and adopt a nuanced approach to their inclusion.

CRediT authorship contribution statement

Maria Jose Oliveros: Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization. **Sara Ibrahim:** Writing – review & editing, Validation, Data curation. **Gonzalo Bravo-Soto:** Writing – review & editing, Validation, Data curation. **Natalia Chahin-Inostroza:** Writing – review & editing, Data curation. **Carlos Zaror:** Writing – review & editing, Data curation. **Constanza Ulloa-Lopez:** Writing – review & editing, Data curation. **Álvaro Sanhueza:** Writing – review & editing, Data curation. **Pamela Seron:** Writing – review & editing, Visualization, Validation. **Dena Zeraatkar:** Writing – review & editing, Methodology. **Gordon Guyatt:** Writing – review & editing, Methodology. **Nancy Santesso:** Writing – review & editing, Methodology. **Romina Brignardello-Petersen:** Writing – review & editing, Supervision, Methodology, Funding acquisition, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary data

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Data availability

Data will be made available on request.

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