Supplementary Material 2

Incidence and characteristics of adverse events in paediatric inpatient care: a systematic review and meta-analyses

Quality Assessment Tool for Global Trigger Tool, Trigger Tool or Harvard Medical Practice Study methodology studies

State your review question here and answer all signalling questions and judgements considering this review question.

Aim: The aim is to report incidence and characteristics of adverse events (AEs), in paediatric inpatient care, as detected with Global Trigger Tool (GTT), Trigger Tool or the Harvard Medical Practice Study methodology.

Tick the PICO that applies to the study report you aim to assess

□ PICO 1:

P Patient records to paediatric patients hospitalized to any paediatric ward with **normal level of inpatient care such as surgical, medicine or orthopaedic wards etc.**

I The manual retrospective record review (RRR) methods: GTT, a modified GTT version so called Trigger Tools (added/removed/modified triggers) or Harvard Medical Practice Study methodology.

C Not applicable.

O Incidence overall and by characteristics of AEs.

□ PICO 2:

P Patient records to paediatric patients hospitalized to any paediatric ward with **higher level of inpatient care such as paediatric intensive care units/neonatal intensive care units etc.**

I The manual retrospective record review (RRR) methods: GTT, a modified GTT version so called Trigger Tools (added/removed/modified triggers) or Harvard Medical Practice Study methodology.

C Not applicable.

O Incidence overall and by characteristics of AEs.

Dillner P, *et al. BMJ Qual Saf* 2022;0:1–17. doi: 10.1136/bmjqs-2022-015298

DOMAIN 1A: PATIENT SELECTION

Describe methods of patient selection:

Describe the rational for your judgement:

A. Risk of bias

Signaling questions:

1. ***Was a consecutive or random sample of patient records enrolled?***
   Yes / No / Unclear
   Reflect if all the subjects selected or recruited were from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants in a consecutive manner? If all accessible patient records were selected as sample or if the process of sampling was done with the method of random sampling, the question will be answered as "yes".

2. ***Are the selection criteria described in a way that the study population of interest is likely to be included?***
   Yes / No / Unclear
   This question will be answered with "no" when patients with different profiles are not considered. This typically occurs by exclusion at study entry. Such exclusions are likely to alter the estimates of incidence, potentially leading to over- or underestimations of the incidence of AEs. For example: exclusion of certain group of patients due to a long length of stay or with lots of transfers.

RoB judgement: Could the selection of patient records have introduced bias?
RISK: LOW / HIGH / UNCLEAR

B. Applicability:

If a study did not meet the patient population or setting as described in the review question, there will be a high concern regarding its applicability. In this specific review, we allow for a broad range of in-hospital specialities and care levels. If the case mix or types of specialties in the study do not fit the review question, this may result in a high concern of applicability. Only classify in *unclear* if the report does not specify the patient population.

Do not punish a study twice. If risk of bias is rated as high, applicability should be rated as high only if additional issues are raised.

Are there concerns that the included patients and setting do not match the review question?
CONCERN: LOW / HIGH / UNCLEAR

DOMAIN 1B: REVIEWER

State the determined number of reviewers:

Describe the reviewer characteristics (e.g., training, experience):

Describe the rational for your judgement:

A. Risk of bias
Signaling questions:

1. ***Were reviewers selected based on his/her relevant clinical background?***
   Yes / ***No*** / ***Unclear***
   The lack of experience of the reviewer(s) in the clinical setting may introduce bias. For reviewers with appropriate clinical background within pediatric care the bias might be lower.

2. ***Were reviewers trained on using trigger tool methodology and application?***
   Yes / ***No*** / ***Unclear***
   The lack of RRR training in applying the RRR may introduce bias. For reviewers with more training the bias might be lower.

3. **Did reviewers have experience in applying the targeted RRR methodology or another structured RRR methodology?**
   Yes / ***No*** / ***Unclear***
   The lack of RRR experience in applying the RRR may introduce bias. For reviewer with more RRR experience the bias might be lower.

RoB judgement: Could the selection of reviewers have introduced bias?
RISK: LOW / HIGH / UNCLEAR

B. Applicability*:*
For example, if the profile of reviewers applying the RRR method in the study substantially differ from the profile of health care professionals that would apply the RRR in clinical practice, a high concern may arise.

Do not punish a study twice. If risk of bias is rated as high, applicability should be rated as high only if additional issues are raised.

Are there concerns that the reviewers do not match the review question?
CONCERN: LOW / HIGH / UNCLEAR

DOMAIN 2: RECORD REVIEW PROCESS

Description of the record review process:

Describe the rational for your judgement:

A. Risk of Bias
Signaling questions:

1. ***Did the reviewers first judge/analyze the records independently (e.g., stage 1 screening) and then together?***
   Yes / No / Unclear
   Lack of independent review/screening in duplicate and consensus discussions may introduce bias. The risk of bias might be lower if the reviewers are working in pair with an independent review/screening stage and then a consensus stage.

2. **Did the reviewers have any kind of support during the review process?**
   Yes / No / Unclear
   Lack of support by a supervisor / senior during the review process may introduce bias. For reviewers with support the bias might be lower.

3. **Did the study have a monitoring/auditing process?**
   Yes / No / Unclear
   Lack of a monitoring/auditing process during the review process may introduce bias. The risk of bias in the review process might be lower if a monitoring/auditing process has been carried out.

RoB judgement: Could the conduct or interpretation of the trigger tool have introduced bias?
RISK: LOW / HIGH / UNCLEAR

B. Applicability*:*
If the RRR process or its implementation differ from your review question the results may not be applicable.

Do not punish a study twice. If risk of bias is rated as high, applicability should be rated as high only if additional issues are raised.

Are there concerns that the RRR process or its implementation differ from the review question?
CONCERN: LOW / HIGH / UNCLEAR

DOMAIN 3: OUTCOMES

Description of the definition of AE:

Describe how incidence was measured:

Describe the time frame of included AEs:

Describe the rational for your judgement, including if you deem definitions to be standard, or deviating from our review definitions:

A. Risk of Bias
Signaling questions:

1. ***Is the AE defined using a generally accepted definition?***
   Yes / No / Unclear
   IHI´s definition: "unintended physical injury resulting from or contributed by medical care that requires additional monitoring, treatment or hospitalization, or that results in death." (Griffin F, Resar R. IHI Global Trigger Tool for Measuring Adverse Events (second edition). Cambridge, Massachusetts: Instutute for Healthcare Improvment, 2009).

   HMPS´s definition: "unintended injury or complication which results in disability, death or prolonged hospital stay and is caused by health care management." (Wilson RM, Runciman WB, Gibberd RW, et al. The Quality in Australian Health Care Study. Medical Journal of Australia 1995;163(9):458-71).

2. ***Were AEs included if they occurred before, during and after index admission?***
   Yes / No / Unclear
   In the origin GTT and HMPS methodologies AEs are included following three inclusions periods (time frames). 1) the AE occurred before index admission and were the reason to index admission or were detect during index admission; 2) the AE occurred and were detected during index admission; and 3) the AE occurred during index admission and were detected after index admission (for example, an operation during index admission led to an infection or a pulmonary embolism postoperatively after discharge).
   Not following these inclusion periods may introduce bias. Such exclusions are likely to alter the estimates of incidence, potentially leading to underestimations of the incidence of AEs.

RoB judgement: Could the definition of outcomes have introduced bias?
RISK: LOW / HIGH / UNCLEAR

B. ***Applicability****:*
If the time frame of included AEs differs from your review question the results may not be applicable.

Do not punish a study twice. If risk of bias is rated as high, applicability should be rated as high only if additional issues are raised.

Are there concerns that the definition of outcomes differs from the review question?
CONCERN: LOW / HIGH / UNCLEAR

DOMAIN 4: FLOW

Description of the flow (number of patients included and number of patients analyzed):

Description of reasons to exclude patients from the statistical analyses:

Describe the rational for your judgement:

A. Risk of Bias

Signaling questions:

1. **Was the completeness of health records data adequate?**
   Yes / No / Unclear
   If yes, the risk of bias will be lower since it considers missing data for the analysis.

2. **Were all patients included in the analysis of incidence?**
   Yes / No / Unclear
   This question will be scored as "yes" if all patients who were recruited into the study were included in the analysis. No is scored if one or more patients are missing. High risk of bias may be judged if a substantial number of recruited patients is excluded from the statistical analysis. High risk of bias may be judged if reasons for exclusions of patients are reported and deemed likely to alter the estimates. If reasons are not reported, you may assume that one third of the missing would not be at random, and you should reflect if this may affect the study estimates importantly.

RoB judgement: Could the patient flow have introduced bias?
RISK: LOW / HIGH / UNCLEAR

Study level / Outcome level overall judgements

A. Risk of Bias

Guidance on how to reach your overall judgement	
Low risk of bias	• The study / result is judged to be at low risk of bias for all domains
High risk of bias	• If you have judged high risk of bias in one domain, it puts the study / result at overall high RoB OR • The study has a judgement of *UNCLEAR* in multiple domains in a way that substantially lowers confidence in the study / result
Some concerns	• The study has a judgement of *UNCLEAR* in at least one domain

Overall RoB judgement for the study:
RISK: LOW / HIGH / UNCLEAR

Tick one of the following options:

☐ **Study level judgement applies to all eligible outcomes**

☐ **Overall judgement depends on the outcome appraised**

If the overall judgement differs depending on the outcome assessed, describe the outcomes and each outcome specific overall judgements here:

Outcome	Overall judgement

B. Applicability

Guidance on how to reach your overall judgement	
Low concern	• The study / result is judged to be at low concern for all domains
High concern	• If you have judged high concern in one domain, it puts the study / result at overall high concern OR • The study has a judgement of *UNCLEAR* in multiple domains in a way that substantially lowers applicability of the study result(s)
Some concerns	• The study has a judgement of *UNCLEAR* in at least one domain

Overall judgement concerning applicability for the study
CONCERN: LOW / HIGH / UNCLEAR

Tick one of the following options:

☐ **Study level judgement applies to all eligible outcomes**

☐ **Overall judgement depends on the outcome appraised**

If the overall judgement differs depending on the outcome assessed, describe the outcomes and each outcome specific overall judgements here:

Outcome	Overall judgement