

Appendices

Appendix A1: Search strategy

As of April 16, 2020

| # | Searches | Results |
|----|---|---------|
| 1 | (quality and (improv* or enhance*) and (intervention* or initiative* or strategy* or program*)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, organism supplementary concept word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] | 145159 |
| 2 | quality improvement.mp. or exp Quality Improvement/ or exp Total Quality Management/ or exp Quality Assurance, Health Care/ | 364776 |
| 3 | quality initiative.mp. | 1837 |
| 4 | quality of healthcare.mp. or "Quality of Health Care"/ | 74159 |
| 5 | neonat*.mp. | 288516 |
| 6 | 1 or 2 or 3 or 4 | 526791 |
| 7 | 5 and 6 | 7639 |
| 8 | limit 7 to ("review articles" and (meta analysis or "review" or "scientific integrity review" or "systematic review" or systematic reviews as topic)) | 1864 |
| 9 | 7 not 8 | 5775 |
| 10 | limit 9 to yr="2009 -Current" | 3837 |

Appendix A2: Description of SQUIRE 2.0 items modified for the data abstraction

| SQUIRE 2.0 Item | SQUIRE 2.0 Description | Reason for modification | Implications of modification |
|------------------------|---|--|--|
| 1, 2 | 1. Title: Indicate that the manuscript concerns an initiative to improve healthcare (broadly defined to include the quality, safety, effectiveness, patient-centeredness, timeliness, cost, efficiency, and equity of healthcare) | Exclude: The inclusion criteria required the title to indicate that the manuscript concerned an initiative to improve the quality, safety, and value of healthcare. If otherwise, the study would have been considered as not available (no title) or non-QI intervention studies. | None: Title was an inclusion criterion |
| | 2. Abstract: a. Provide adequate information to aid in searching and indexing. b. Summarize all key information from various sections of the text using the abstract format of the intended publication or a structured summary such as: background, local problem, methods, interventions, results, conclusions. | Exclude: An abstract was included in all the articles that we considered for assessment. If not, the study would have been a commentary or letter. The SQUIRE 2.0 requirement for abstracts would qualify every study that included an abstract. Therefore, this item does not add to an article's quality of reporting, and was thus excluded from the checklist. | None: All studies met the SQUIRE 2.0 reporting criteria |
| 9b | Approach used to establish whether the observed outcomes were due to the intervention(s) | Exclude: The details of this item is also captured in another item "Description of the approach to the ongoing assessment of contextual elements that contributed to the success, failure, efficacy and cost" (Item 10c)- The examples provided in SQUIRE | Implications: Studies that have included both an assessment of (1) whether observed outcomes were due to interventions, and (2) Measures to assess how contextual factors interacted with interventions, would only receive one additional point instead of two |

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| | | <p>2.0 E&E on describing this item could be applied to item 10c.</p> <p>Likewise, the SQUIRE 2.0 E&E does not ask one to definitively assess whether the observed outcomes are due to interventions, only that extraneous factors besides the intervention effects are being measured/assessed. This is similar to item 10c.</p> | <p>additional points in reporting assessment.</p> <p>However, we have found distinguishing both items to be infeasible.</p> |
| 10a | <p>Measures chosen for studying processes and outcomes of the intervention(s), including rationale for choosing them, their operational definitions, and their validity and reliability</p> | <p>Split into 2 categories: (1) Outcome measures, (2) Process measures</p> <p>We sought to assess outcome and process measures separately instead of assessing them as a single item. Numerous quality improvement training workshops have emphasized that both outcome measures and process measures are important,¹⁻³ and hence, should be reported.</p> <p>Process measures are surrogate measures of clinical/patient outcomes</p> <p>It is possible that some studies may not require reporting of both outcome and process measures. However, we believe the absence of reporting outcome or process measures should be penalized, and hence, both will be assessed.</p> | <p>Implications: Journal articles that may not need to report an outcome or process measure, and hence did not report it, would be penalized in its reporting assessment.</p> <p>However, we believe it was more important to give a higher rating to articles that rigorously reported both their outcome and process measures. Hence, this tradeoff was acceptable</p> |
| 13b | <p>Details of the process measures and outcome</p> | <p>Split into 2 categories: (1) Outcome measures, (2) Process measures.</p> | <p>Same implications as above</p> |

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| | | Same rationale as 10a; this pertains to outcome and process measures in the Results section | |
| 13c, 13d | c. Contextual elements that interacted with the <u>intervention(s)</u> d. Observed associations between outcomes, interventions, and relevant contextual elements | Combine/Exclude 13d: (1) Both items pertain to the reporting of contextual factors in the study results. (2) Item 13d is not universally applicable to all studies: A quantitative measure of association such as odds ratio or relative risk is not applicable to every study. Without these, description of association will blend with description of contextual factors | Studies that should have reported quantitative measure of association such as odds ratio or relative risk would not be penalized. However, it is challenging (subjective) to ascertain which studies would require such reporting. |
| 13e | Unintended consequences such as unexpected benefits, <u>problems</u> , failures, or costs associated with the <u>intervention(s)</u> . | Modify: Articles that described this item in the Discussion section instead of Results section also satisfied this criterion Explanation: There is no indication in the SQUIRE 2.0 Explanation & Elaboration document that such item must be included in Results section. Pilot-testing of articles revealed that this item was often mentioned in the Discussion section. There was no item in the Discussion section that expressed a similar idea/concept | Studies that should have systematically (i.e., quantitatively) assessed the unintended effects of their intervention, but did not do this, and instead mentioned unintended consequences as a discussion point, would not be penalized. However, it is challenging to ascertain if a study was required to systematically assess unintended effects. |

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| 15e | Costs and strategic trade-offs, including opportunity costs | Exclude: Absence of this item would not compromise the quality of reporting. It is not necessary for all QI studies to include a health economic component. | Studies that should have reported costs and trade-offs would avoid being penalized for not reporting it. However, this item is not universal to all QI manuscripts. Also, whether a study “should” have reported this item is highly subjective. |
| 16a, b | a. Limits to the generalizability of the work b. Factors that might have limited internal validity such as confounding, bias, or imprecision in the design, methods, measurement, or analysis | Combine: Authors should describe the limitations of their work as they see most suitable, whether it is discussing limitations to design, sustainability, analysis, generalizability, etc. | Studies that did not report a specific type of limitation as stated in the checklist would not be penalized if they stated the study limitations. |
| 17c,d,e | c. Potential for spread to other contexts d. Implications for practice and for further study in the field e. Suggested next steps | Exclude: After examining the elaboration involving these items, they were found to convey similar meaning to item 17a ⁶ : Usefulness of the work | Studies that reported any of these three points in their conclusion would not be rewarded points. However, the implications are minimal as these items can be described, as needed, as a study’s “usefulness of work” (Item 17a). |
| 18 | Sources of funding that supported this work. Role, if any, of the funding organization in the design, implementation, interpretation, and reporting | Exclude: Examined as an independent variable associated with the quality of reporting. | None |

Appendix A3: Keywords for determining if a study is considered Quality Improvement

Plan-do-study-act (PDSA) or “Model for Improvement- Studies with these keywords are QI studies.

Explanation: Plan-do-study-act is a specific approach for executing a QI project- The Model for Improvement framework uses this approach

“Lean” management/six-sigma

Explanation: Another QI framework

Antibiotic/antimicrobial stewardship

Explanation: Common topic in neonatology; focused on improving process and safety of care

CLABSI/Central Line-Associated Bloodstream Infections

Explanation: Common topic in neonatology; focused on improving process and safety of care

“Leaders” and “champions”

Explanation: The team which spearheads QI initiatives are often called "champions"

SMART (Specific, Measurable, Time-defined) aims

Explanation: Oftentimes, the objective of a QI project is to achieve a specific, quantifiable goal over a specified period of time

Keywords “Bundle”/ “Package”

Explanation: Many QI studies consists of these keywords

Keywords “control chart”

Explanation: Many QI studies contain control charts (run charts, statistical process control) to monitor changes over time.

Appendix A4: Information on decision processes for screening and data abstraction**Box 1:** Description of decision process for the inclusion and exclusion of articles during screening**Include:**

- Is there an **intervention**
- Is there an **outcome** that can be **measured**
- Does the article describe a **change** in the outcome **over time**

Key phrases to determine if there is change (These are just some examples)

- “Change...”
- “Before....After....”
- “Pre-post”
- “___ outcome improved by...”
- “at baseline...in the follow-up...”

Exclude:

- Studies solely discussing barriers to quality improvement
- QI intervention stories, theories and frameworks
- Meta-analysis, systematic reviews, literature synthesis
- Development or Testing of QII-related tools (e.g., testing: sensitivity, specificity, reliability, validity, usefulness, acceptability of tool)

Box 2: Reasons for disagreements between reviewers in data abstraction

1. One of the two reviewers was unable to locate the relevant information that met a specific SQUIRE 2.0 reporting requirement. To elaborate, finding information that satisfied specific reporting criteria often involved reading specific details within paragraphs and discerning whether the information represented adherence to a SQUIRE 2.0 item (i.e., hard to find relevant information).
2. Reviewers disagreed on whether specific information constituted as inclusion for a specific SQUIRE 2.0 checklist item.

References

1. Chartier LB, Stang AS, Vaillancourt S, Cheng AHY. Quality improvement primer part 2: executing a quality improvement project in the emergency department. *Canadian Journal of Emergency Medicine*. 2018;20(4):532-538. doi:10.1017/cem.2017.393
2. Health Quality Ontario. Measurement for quality improvement. *Toronto, ON, Canada: Queen's Printer for Ontario*. Published online 2013.
3. Johnson K, Hagadorn J, Sink D. Alarm Safety and Alarm Fatigue. *Clinics in Perinatology*. 2017;44. doi:10.1016/j.clp.2017.05.005