Author’s response to reviews

Title: Use of health economic evaluation in the implementation and improvement science fields – A systematic literature review

Authors:
Sarah Roberts (sarah.l.roberts@kcl.ac.uk)
Andrew Healey (andy.healey@kcl.ac.uk)
Nick Sevdalis (nick.sevdalis@kcl.ac.uk)

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Author’s response to reviews:

London, April 10th 2019

Dear Professor Flottorp,

Thank you for your thoughtful and positive evaluation of our manuscript, “Use of health economic evaluation in implementation and quality improvement research – A systematic literature review”, and the decision to invite a revised version in accordance with the comments of the reviewers.

In what follows, we have summarised the points raised by the reviewers (in italics), and have described our response to them and the relevant amendments to the manuscript.

Reviewer 1:

ABSTRACT

overall lacked important detail on the methods and results were not very informative.

(line 13) - delete methodologies (which means to use a system of methods for a particular area of study) and insert 'methods' (i.e. procedures used for accomplishing the research outcome)

(line 14) - delete reported and insert 'this'

(line 15) - across the Agris etc - date range, keywords or eligibility for inclusion? Did you consider the ECOLIT database?
(line 20) - inclusion criteria ??

(line 24-28) - Comment: But this tells me nothing about what you found? Summary of setting, study type, countries where the research has been undertaken

(line 30 - 31) - 'the overall quality of evidence has improved compared to earlier studies identified in earlier reviews' - remove from the abstract

(line 29-35) - Comment: you could be briefer to expand methods and results

Thank you for your thoughtful and helpful comments. We have completely rewritten the abstract to be more informative and concise and we have changed or clarified the highlighted grammatical errors throughout.

We have expanded the information about the searches done and additionally run a new literature search in the EconLit database. This search added an additional 470 abstracts and after screening, four extra papers were included. This has changed some of the results and conclusions of the literature and has been reflected throughout the paper.

BACKGROUND

(line 44) - 'improvement interventions' - Comment: from an economic perspective?

(line 50) - 'focused' NOT focuses

(line 56) - Insert 'the' after on -' Depending on the service'

(line 56) - delete 'structure and methodology' and insert 'methods' Comment: simplify

(line 60) - insert comma after 'programme evaluation'

(line 63) - delete localities and insert 'settings'

(line 69) - Insert 'In' - e.g. In two earlier reviews

(line 69) - delete 'examined'

(line 70) - delete 'and' - insert 'were examined and the authors found'

(line 71) - insert 'of' after 'cost-effectiveness'

(line 72) - delete 'carried out, hence' - insert 'published and'

(line 74 - 76) - Comment: describe a summary of where used? More relevant for clinical audiences
Thanks again for the detailed comments on the grammatical errors in this manuscript and they can be seen in tracked changes on pages 4-5. We have changed or clarified all the points highlighted above.

MATERIAL AND METHODS

(line 80) - delete 'methodology was applied' - insert 'was undertaken'

(line 81) - (date of most recently published evidence review) - comment: or their last end date searched? Ecolit?

(line 87) - Insert 'to' - after 'conducted'

(line 88) - delete 'evaluating' and insert 'whereby'

(line 89) - insert after 'practice' - 'were evaluated,'

(line 90) - 'staffing inputs.' Comment: for the purpose of QI?

(line 95) - 'public health' - Comment: ? hospital tertiary

(line 93) - what about also listing the conditions or applications these studies were undertaken in? What are the interventions tested e.g audit and feedback? Use of opinion leaders, etc

Re: line 93 comment: we have removed this paragraph as this was duplicating what was done during the data extraction and was not actually part of the search strategy, which line 93 of the paper was concerned with. We have added in information about the type of intervention reported, as suggested.

We have also clarified or changed all highlighted grammatical problems. These are available in tracked changes on pages 5-6.

As mentioned earlier, and in line with your very helpful suggestion, we have now searched EconLit and included an additional four papers that this allowed us to identify. The dates of the search have also been added for clarity.

We have further clarified that hospital and tertiary healthcare were included, and around the inclusion of staffing inputs.

SCREENING

(line 103) - delete 'included' and insert after borderline 'for inclusion'
(line 104) - Comment: other authors involved?

(line 115) - insert (a) Implementation (b) Quality improvement - Comment line 117 - 119) are these related to a & b?

(line 131) - delete 'Followed one of the' - insert 'The following study designs were acceptable/included:

(line 139) - insert 'for' after 'To mitigate for'

(line 143) - delete 'not included' - insert 'excluded'

We have clarified or changed all grammatical errors and points of confusion. These are available in tracked changes on pages 6-7.

The other authors were not involved in the screening process.

Re: (line 115), this was done during the data extraction section and has been discussed there – so the point is addressed.

DATA EXTRACTION

(line 151) - delete 'methodology' - insert 'methods'

(line 152) - delete 'used' insert 'included'

(line 152) - insert 'the' after standard care practice),

(line 153) - delete 'incremental'

(line 156) - insert 'the' after 'effectiveness of'

(line 156) - Comment: were these summarised in any way? Would be helpful

Re: line 156: this refers to the descriptive statistics in the results section, specifically whether ICERs were given. These have been summarised in the text on page 11.

We have added additional columns to the data extraction table 1 (see Table 1, Panels 1 and 2) to now include sample size, types of costs included, summaries of the intervention types, the main study outcomes and what methods were used to measure them. All grammar changed or clarified and wording edits implemented as requested; these can be found in tracked changes on page 9.
QUALITY APPRAISAL

(line 159) - delete 'This gives' - Insert 'Each study is scored out of 100'

(line 161) - delete 'instrument' insert 'framework, the studies were'

(line 162) - Comment: 75 & over or over 75?

Deleted extraneous words on pages 9-10. Clarified that the QHES threshold is 75 or higher and provided a source that supports this cut-off.

DESCRIPTIVE ANALYSIS

(line 185) - insert 'the' after 'management or' - Comment: were some mixed? Setting or focus

(line 194) - Inclusion of two literature reviews - Comment: how many studies were included in these papers? Did they include the same studies you found on individual reports?

(line 197) - The Note listed in the middle of the page makes no sense to me. Please take a standard approach to defining acronyms e.g. define once and use or spell out each time

(line 199) - 'interventions' not 'intervention'.

(line 202) - Insert Capital M. 'More broadly'

(line 206) - insert 'the' after economic models

(line 207) - add 'were excluded from this component'

(line 207) - Comment: says three - above line 192 says two

(line 209) - 74 - comment: very close to 75

(line 220) - delete 'with' - insert 'whereby in'

(line 220) - after 'possible biases' add - 'were discussed'

Comment: On the whole were there I x cost effective over current practice or ? describe the best uses.

Re: Line 194 – we have now added a comment here covering the papers included in the three literature review studies. The search period we covered follows from the Hoomans review, hence no overlap.

Removed line 197 as this was supposed to be attached to panels 1 and 2. After including the new papers the average score has gone up to 76 and so this comment is no longer relevant. In fact,
this section has been substantially rewritten to add in more results and context around them. As this paper is about the quality of the studies and associated health economic analyses as reported and not the quality of the interventions, we originally decided against declaring which interventions were deemed to be cost-effective or not. For those studies that have direct implementation cost or scenarios, we have added a column that describes whether they were deemed cost-effective within the respective studies.

To further address your suggestions, we have added in two new results tables, table 3 and table 4. Table 3 contains details of the studies that included implementation costs and scenarios. Table 4 includes a breakdown of the results by QHES dimension.

DISCUSSION

Needs reworking. See my initial feedback above and further comments below.

(line 230)- delete 'this review aimed' - replace with 'The aim of this review was to'

(line 230 - 235) - Comment: this section seems to repeat the results and rather should summarise the main findings and then provide a more in-depth discussion in relation to the results in the context of other research and what the data tell us? Where are the major gaps e.g in community care or hospital care? Which interventions are more cost-effective than others and which ones appear to have no economic evidence (can you provide examples)?

Thank you for making useful suggestions regarding the discussion – which we have taken on board and reworked the entire section to produce what we feel is a much stronger discussion as a result.

The setting of each study is in table 1 (panels a and b), and these have been summarised in the results section. We have now added some commentary on where the main gaps are to the discussion section, however identifying interventions as cost-effective was not in the aims or scope of this review (see also related point above). All studies had to have some economic evidence as part of the inclusion criteria of the review.

(line 261) - Comment: why would this be, can you discuss?

Line 261: This refers to why implementation costs are not routinely collected. This has been quantified (in table 3) and discussed further on page 15.

(line 285) - Comment: the maturity of the field since the last reviews need to be highlighted. Economic evaluation and transparency of reporting has come a long way so is this really surprising?

(lines 308 - 316) - Comment: applicable to all economic evaluations so unsure what this adds
(line 322) - Comment: but also aligned to maturity of the field and a greater focus on transparent reporting

As stated earlier, the discussion has been completely reworked in line with comments from all three reviewers. We have removed repetition of the results and focused instead on reflecting upon the evidence and what it suggests regarding health economic evaluations within the arena of implementation and improvement research. We have commented on the improvement of the quality of reporting over time; as well as the limitations and strengths of this review. We have finally expanded on what these findings mean for the further development of economic evaluations of improvement and implementation studies, which we have expanded on significantly.

Panel 1a.docx

I think this table could include more information about the included studies.

Sample sizes for each study

Describe the intervention

Describe the main outcome (e.g. ICERs, summary of main conclusions)

Added more information to this table and to panel 1b as well. As requested, we have added sample sizes, descriptions, intervention type and the main study outcomes.

Reviewer 2

This systematic literature review assessed the quality of methodologies used in health economic evaluation in implementation and quality improvement research from 2004 to 2015. The paper provides an overall assessment of the quality of the literature by presenting the overall scores of the Quality of Health Economic Studies (QHES) framework. However, the paper doesn't assess specific areas for improvement. The contribution of the paper will increase significantly if it can identify specific areas for future improvement.

Thank you for these comments. The results and discussion have been revised significantly to give specific areas for improvements and also more information around the QHES (see also response to reviewer 1 above regarding the nature of the discussion section of the paper).

It will be much more helpful to examine the individual components of the QHES to identify the areas that need to be improved for future studies.
This is a useful comment. Table 4 has now been added, outlining the average QHES score for each dimension and the percentage of papers that achieved top scores for each dimension.

Assessing the strengths and weaknesses of the cost measures and effectiveness outcome measures of the literature will be important to inform future research.

Details of the outcomes measures used are now included in table 1 – panels a and b. We have added some commentary about how the health economic measures used compare and about the types of costs considered (incl. costs that appear to remain ‘hidden’ from study) – which the focus of this review.

2. An important aspect of economic evaluation is to assess the cost of implementation strategies, which is critical for organizations when considering their options of implementing evidence-based care. I would suggest that the authors consider including this type of cost studies. Below are a few publications in this area.


Our aims for this review were to examine the extent that both costs and benefits of implementation and improvement and considered as a holistic approach to evaluation, therefore these papers were excluded as they are cost studies, rather than cost-effectiveness studies. We trust the referee will see how our review rationale applies here. We have endeavoured to make this clearer in the manuscript.
Reviewer 3:

The manuscript could be strengthened with attention to the following points:

1) From my viewpoint this review misses an opportunity to present new information on economic evaluation of implementation / improvement science. It adds little to the literature. The aim was to examine advances, however the manuscript focuses on a count of the number of new evaluations in this field and a quality assessment of the economic evaluations of implementation/improvement studies.

The review was intended to provide an update to the Hoomans et al paper of 2010 and to determine what had changed in the literature in the past years. We have performed analysis on the thirty new papers included, and have determined that the literature has improved in quality, and have made recommendations on how to improve this in the future. We have endeavoured to improve the way this is written up to highlight the work that has been done in this area.

2) The systematic review inclusion criteria have limited included studies to English language. This may produce a publication bias and non-English language studies for example, French, Spanish would have been addition to the prior review.

We appreciate this is a limitation. It was unfortunately outside the capability of the review team to undertake inclusion of studies not reported in English. We have added the language restrictions as a limitation in our discussion.

3) Minor: some grammatical issues should be rectified to improve readability.

We have revised the entire manuscript, including implementing the language recommendations of reviewer 1. We have had the revised manuscript proofread before submission to improve the flow of the writing.

4) Some explanation of how the databases were chosen and the benefit of using Rayyan for screening and data extraction would be informative.

These have been added. Please note that we have expanded the evidence covered through inclusion of the EconLit database in the review. We have also added a sentence about the benefits of Rayyan.
5) Detail about the methodological advances with respect to the economic evaluation of implementation / improvements studies would be interesting.

This is a very useful point – which we have now added and elaborated on, in the final section of the discussion.

6) Further detail about the nature of the implementation / improvements studies included in the review would also be interesting. i.e. expand Table 2

This table has been expanded in line also with the recommendations of reviewers 1 and 2.

7) A stronger rationale for a cut-off of 75/100 for good quality in QHES instrument is needed.

Added in a full reference for the quality threshold, which supports our decision making.

We would like to thank again the editorial team and the reviewers for these insightful comments that helped us clarify and improve the manuscript. We do hope that, following these revisions, the manuscript is acceptable for publication in Implementation Science.

Kind regards,

Sarah Roberts, on behalf of all authors

King’s College London