Reviewer’s report

Title: Understanding success and failure in multimorbidity: protocol for using realist synthesis to identify how social learning and workplace practices can be optimised

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Reviewer: Marjolein Dieleman

Reviewer’s report:

Overall
I have read with interest the protocol. The topic of interaction between medical education in practice-settings and delivering patient-centered care is timely and challenging.

I have some questions for the researchers:

My main question is on the feasibility of the review. I wonder if this topic, because of its complexity and the indication of the researchers that so far few documents were identified, is not better researched as an evaluation question instead of a review question. Many different types of variables and issues are proposed to be researched. It is questionable if this can be done through a review.

Major compulsory revisions

Research topic and justification

Overall well explained. However, it would be important for the researchers to better explain why they feel that the focus on multimorbidity is required?

I also question the statement on p. 10 that the focus of medical training is on one condition at a time and request the researchers to better reference the statement that current medical training does not focus on multimorbidity.

Review method

Although the topic seems appropriate for a realist review, the current protocol needs to better explain the methods. Currently the methodology seems very generic and needs to be better explained in the context of the proposed review. More specifically:

• Section 5- reason for this review method: please define CMO and operationalize this in the context of this synthesis
  o Although it is true that identification of cmo is useful to explore and explain, the absence of definitions/descriptions of these concepts in this particular study might make this a difficult exercise (p.16)

• Section 5-study objectives/research questions:
  o More clearly explain the research questions from a realist perspective- how will CMO be identified? How are outcomes defined? And how is the main objective of
identifying/understanding interactivity included in the data analysis matrix?

- It is not very clear if the Vygotskian theory of workplace learning (Activity theory) is being tested and how? - this could be made more explicit by more clearly spelling out this theory and relate these to the research questions.

- In the context of realist synthesis please explain “identifying mechanisms that lead to negotiations of needs-based and relationship based outcomes.” – define these outcomes and relate these to the consequences. (p.13)

- Theoretical orientation: please operationalize VICTORE and CMO for this particular review by giving a specific example, and through visualization. It is unclear if a theory is being used as starting point for the synthesis (Activity theory) or if the articles are being analysed and theory will be built from the literature- this needs to be better explained (p.15/21). And how does the data matrix takes the approach of the context in terms of VICTORE into consideration?

- p.16/p.21 - how will different patients groups and experts be involved in data extraction- this seems a difficult exercise to undertake given the complexity of this review.

- Analysis and interpretation (p 21/22)-
  - Process data: there are too many issues for data extraction on the process- this seems nearly impossible to do.
  - How do the examples of type of data relate to the research questions and to the data extraction matrix?

- p.22 last sentence: What is meant with “ undertake a more detailed realist analysis of each part of our program theory to see etc.

- p25 Limitations: it is important that the researchers add the risk of limited literature to identify interaction in particular contexts (see main question on feasibility).

Minor essential revisions and discretionary revisions: none

Summary of review questions:
1. Will the study design adequately test the hypothesis?
   No (see explanation above)

2. Are sufficient details provided to allow replication of the work or comparison with related analyses: if not, what is missing?
   The method is too unclearly explained to allow replication (e.g. p.22- all can physically not be done)

3. Is the planned statistical analysis appropriate?
   N/A

4. Is the writing acceptable?
   Yes
Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests