Reviewer's report

Title: A systematic review protocol for measuring comorbidity in inpatient rehabilitation for non-traumatic brain injury

Version: 3  Date: 19 November 2014

Reviewer: Maya O'Neil

Reviewer's report:

Thank you for providing these significant revisions to your protocol which improve the quality and clarity. I have a few remaining revisions to suggest.

1. First, the writing is improved but still needs to be reviewed for grammar and clarity. Perhaps because of the track changes it is difficult to ensure that sentences flow well, so I would recommend that authors review a draft with all edits incorporated.

2. The purpose of the review is clarified; however, I still feel that the rationale for such a review is not strong. While comparing the validity of comorbidity assessment tools has value, it is not clear that there is a specific need to address this concern in this population, particularly given the breadth of patients included in the definition of nTBI. The rationale could be strengthened by listing more comorbidity assessment tools, highlighting their differences and similarities, and hypothesizing why one would be more or less applicable or relevant for this population. In your search strategy, you list many indices (40. ('charlson comorbidity index' or 'CCI' or 'CMI' or elixhauser or 'BOD index' or 'cumulative index rating scale' or 'CIRS' or 'Coroni-Huntley index' or 'DUSOI index' or 'Hallsstrom index' or 'Hurwitz index' or 'Incalzi index', 'Kaplan index', 'Liu index', 'Shwartz index').tw.) and summarizing research on other populations which has highlighted important validity findings would be helpful yet are potentially different in this population.

3. You need to better clarify how the data will be used to answer the questions of interest. Your data extraction sheet states, "comorbidity results," but it is unclear what type of results you are looking for to answer your questions of interest. How does the data tell you which tool is preferable? Are you comparing the tools to some other gold standard (if so, what are the comparators that are included)? A better description of face and predictive validity, and how these are addressed by the studies you will include, is needed. These are points which need additional development in your protocol in order to strengthen the rationale for this review. In your cover letter you elaborate on the purpose, noting, "The purpose is not to study the effectiveness of specific clinical or rehabilitation interventions but to inform efforts to develop a predictive multivariable model of rehabilitation outcomes (e.g., function independence measure efficiency) for health services research based on population based administrative health data." This rationale is still unclearly stated, particularly in the protocol itself. The specific ways the data...
will help develop such models, and how such models are related to the validity of comorbidity assessment tools, both need explanation and support.

4. Your current rationale still includes some circular logic. For example, you state, "Selecting the most valid comorbidity measurement method specific to the nTBI population in the rehabilitation setting can ensure that comorbidities are accurately and appropriately assessed in their influence on rehabilitation outcomes." This is basically saying that validity ensures validity. When strengthening your rationale, please attempt to remove such circular arguments.

5. A major concern that remains is the exclusion of stroke patients, and this rationale, though strengthened in the revision, is still unclear and inadequately supported. You mention in your cover letter that stroke is not always included in the definition of nTBI, yet I don't believe that it is commonly excluded. This point needs much more support to be used as part of the rationale for exclusion. Additionally, you state that (1) we acknowledge that a separate systematic review on stroke rehabilitation is warranted and (2) a systematic review on measuring comorbidity in the stroke population already exists. These points seem to counter each other. If a review of comorbidity measurement in stroke already exists, then it could easily be included in your systematic review's narrative synthesis by summarizing these results. There are also research networks for nTBI conditions other than stroke (e.g., cancer), yet this remains included in your review. Finally, the clinical rationale for including vascular insults but excluding stroke is very unclear. I strongly suggest that you include summaries of recent reviews of stroke, when available, and include primary research on stroke for key questions when other reviews aren't available.