Reviewer's report

Title: Factors associated with the utilization and costs of health and social services in frail elderly patients

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Reviewer: jimmie kristensson

Reviewer's report:

Thank you for giving me the opportunity to read and review this manuscript. The manuscript has some interesting results. However I have some questions, especially regarding the method and the manuscript is in need of revision and clarification before it is suitable for publication. Please, see my specific comments below.

Major compulsory revisions:

1. The aim would benefit from being clarified. First: The aim contains the words influence and effects and I am not convinced that the study design is strong enough for causal inferences. I think that the term association is more preferable when the analysis is based on cross sectional data. Second: The term patient characteristics could be more specific and it is not elderly in general that are in focus – it is frail older people. The last is important since the author's state in their discussion that external validity may be limited.

2. The background is short and contains interesting facts. However, it is a bit too short and needs to be elaborated so that the key concepts in the aim are defined and visible. This is needed in order to make the research problem clearly described and motivated.

3. The first statement in the background lacks references. It is true that the increasing demand for healthcare and social services requires a more integrated care for older people – but it is not always true that this requirement leads to a more intense collaboration between service providers. There is literature stating that collaboration is not working and that older people's health care and social services are fragmented - which may have an impact on quality of care and health economics.

4. The second paragraph in the background has a strong Finnish focus (which could be motivated if it is clearly stated in the aim)

5. As described in the third paragraph in the background: It is well known that several variables are associated with health service utilization and costs in older people. This section could be elaborated and be more specific in terms of previous results.

6. The term frailty is not defined and described in the background
7. Integrated care needs to be more clearly defined in the background

8. The design and population section would benefit from a clarification about the study design. One of my main concerns is about the design in general. The sample was part of a previous experimental study meaning that some (it is not stated how many) received an intervention – which could have effected their level of service utilization. I am not convinced that just controlling for rehabilitation in the analysis is enough to erase the effects of the intervention (since the intervention must have been complex). The motivation for the design choice and statistical analysis needs to be clearer, and more information is needed about the RCT in order for the reader to assess its impact on the results in the present study. My main question is, however: Why did the authors not use only those in the control group for this study?

9. Another main concern is that data about consumptions and costs are based on various sources and in general there is a need for a clearer description of the various data sources and registers and their features — and how for instance costs were calculated. This is important for assessing validity and reliability.

10. The inclusion criteria's needs to be clarified: What was the definitions of weakened functional ability and need of regular home help.

11. The self reported questionnaire about outpatient utilization: What were the participants asked about: Number of visits, telephone contacts etc and within what time frame?

12. The section describing the various models of service utilization may be better suited under the analysis section

13. Under the paragraph functional assessment: It is not clear if this data was based on self-reports or physiotherapist assessments. It is not clear how the authors dealt with aspects related to cognitive impairments: For instance: What happened if a participant were judged to have a low value on the MMSE? Did that person still answer questions about QoL and changes in health status and did that person fill out a self-reported questionnaire as well. If so: How did the authors deal with aspects related to reliability and ethics.

14. Under statistical analysis: This part would benefit from a clearer description of the quality of the analyses. The authors stated that they did check for correlations but no information is given about other aspects related to statistical validity: for instance R values and, when suitable, residual analysis.

15. The discussion contains interesting aspects. However in some paragraphs the authors repeat their results and do not discuss them and in some places the conclusions are not clearly motivated in the results or founded in previous research. It is for instance plausible to assume that a decrease in social services may cause higher costs for health care- however, frail old people are known to have complex needs and comorbidity and it is possible that their medical need is not fulfilled within the social service sector so it is not fragmentation but declining
health that causes a great need for health care – and therefore costs.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests