Reviewer's report

Title: The Effects of an Integrated Care Intervention for the Frail Elderly on Informal Caregivers: A Quasi-Experimental Study

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Reviewer: René J.F. Melis

Reviewer's report:

This is a relevant study on the topic of the effects of integrated elderly care models on informal caregivers. This is relevant because the effects of these models on informal caregivers are still much not systematically studied, strangely enough.

Major Compulsory Revisions

1. Introduction: hypotheses on the potential effects of integrated care on informal caregivers are described. I believe a hypothesis that should be added is that perhaps integrated models may also INCREASE the caregiver burden, because better care for the older person may sometimes be the result of placing more demand on the caregiver (e.g. where a new measure beneficial for the care recipient can only be implemented through the informal caregiver, IC).

2. Methods/outcome measures/p8: Primary and secondary outcome measures should be more clearly defined, now the section only describes all measures used without a hierarchy. Also, a clear description of the primary analysis into the research question needs to be added. Now, the paper refers vaguely to table 3 and 4 to identify treatment effects, without integrating the information that results from these analyses.

3. I have much difficulty with the regression analyses presented in table 4 and 5: they seem to lack a clear objective to be answered (at least I did not find an objective introduced in the introduction) and I do not understand their value in the context of evaluating the effects of WCIM on caregiver outcomes. Please make the manuscript/report more straightforward.

Minor Essential Revisions

4. A reference to the questionnaire (and it’s development) referred to in additional file 1) is available and seems relevant to be added: Lutomski JE, Baars MAE, Schalk BWM, Boter H, Buurman BM, den Elzen WPJ, Jansen APD, Kempen GIJM, Steunenberg B, Steyerberg EW, Olde Rikkert MGM, Melis RJF on behalf of the TOPICS-MDS Consortium. The development of The Older Persons and Informal Caregivers Survey Minimum Data Set (TOPICS-MDS): A large-scale data sharing initiative. PLoS ONE. 2013:8(12):e81673.

5. P10, l8 from the bottom: unclear what is meant with: “…‘categories of tasks’ logistic regression analyses were used.”

6. P10, l4 from the bottom: please provide rationale for significance level at
p<0.1. Is very seldom done. I would prefer usage of advices given in (1), e.g. 67% confidence intervals.

7. P10, l3 from the bottom: Unclear what is meant with how multicollinearity was checked, please explain.

8. P10, Analysis: how were practice effects (clustering at the level of the practices that participated) taken into account?

9. Results, p11, l7: 11/103 IC who did not categorize himself or herself as a IC. I would say: either according to a definition one is or is not IC. Please clarify. Further if the care recipient was unwilling to participate (9/113), then still the IC could continue to participate? Have the authors tried whether participants dropping out were willing to participate in collection of a limited set of outcome measures? Often they do. Please clarify. The same goes for transferring tasks to professional caregivers: then still IC are in the role of IC and this does not justify their drop out.

10. P11, l9 from the bottom: “the groups were equal in terms of …” Was that before or after dropouts? How did the non-responders differ from the participants who stayed in the study and was non-response different for the two intervention arms?

11. P11. L9 from the bottom: “…except age;” Age of caregiver? Of care recipient?

12. P11 and table 2: please also provide data on the care recipients and how these participants differed between the groups. Also provide information on the relationship of IC with care recipient.

13. Results, p11, l2/table 1: Please also provide reasons for non-participation of IC when going from 184/193 to 144 and 118 respectively participating IC in the exp and cont group.

14. P11, l6 from the bottom: were these fairly high numbers of people with a low educational level and low income to be expected on the basis of demography of the area in which the study was conducted and may this have affected generalisability of the outcome?

15. P12, the results of within group and between group comparison need to be evaluated in THIS context and not as separate analyses. E.g. p12, l8: “happiness derived from caregiving (PU) remained the same for …” I understand that within the control group the process utility significantly decreased, whereas this was not true in the intervention group. However, at the same time: there ISN’T a significant between group difference in within group change over time (At least in table 3, are “-“ is added for the significance of the between group difference [this “-“ btw needs a footnote in the table!]). Now which is true? The same observation is related to total hours spent per week: no between group differences in change, but within one group a significant change. And other outcome measures show this also. How to interpret these seemingly contradictory findings? Therefore it is always very relevant to have a predefined primary analysis and to interpret all findings in their context. I suggest: An ANCOVA with a certain outcome as Y, and with the “yes/no intervention arm” and BL value of the respective outcome
measure added as a (co)variates. Then, you do not end up interpreting seemingly contradictory findings. Also from table 3 it is unclear on which analysis it was based: with any covariates included, or not?

16. All tables need to be selfexplanatory: e.g. perceived quality of life (0-100) in table 3: explain instrument used, range and direction. Table 4: what is the interpretation of 0.373*** and 0.288** in the row behind SRB score. What is SRB? What is it’s range and direction? Which unit increase in SRB score does the beta reported relate to? Were these univariable analyses, Beware: these are examples of tables not being selfexplanatory, please check them carefully completely. Instead p-values indicated with notes, simply report the 95%CI for the between group differences and the within group changes. Also confusing: the text reports the actual p-value, in the tables only levels of p are indicated with footnotes (e.g. p<0.10).

17. As explained above (comment 3), I prefer a different handling of the analyses presented in tables 4 and 5. However, one subgroup analysis would be of interest and that is whether co-residence is affecting the effect of WCIM on caregiver outcomes. There was the suggestion of this in the Dutch EASY-Care Study (2) and it would be good to see the hypothesis being confirmed or refuted by the current study.

18. P14, results, l5: what do you mean with “each consecutive model”? This may be straightforward for the author, but not for me.

19. The authors describe their intended intervention, but it would very valuable if they could add empirical data on the intervention actually delivered. This is relevant to interpret the findings that the objective burden increased, while subjective burden decreased in the intervention group in addition to the explanation that the authors are looking for in the discussion.

20. P15, l9 from bottom: the authors suggest that the decrease in caregiver burden maybe the result of improving care recipient outcomes. Whereas this seems a logical explanation, it would be stronger (and help the final interpretation) if they could support this statement with empirical data from THIS study (not only a reference to literature in general, because in addition to positive studies, there also is an abundance of negative studies in the area).


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

**Quality of written English:** Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

- I am involved in the development and the EASY-Care instrument for a long time. The WICM used the EASY-Care instrument as a starting point for their assessment and care model
- I am the project leader/principle investigator on the TOPICS-MDS project, which developed the TOPICS-MDS questionnaire, that the authors used to evaluate their intervention: Lutomski JE, Baars MAE, Schalk BWM, Boter H, Buurman BM, den Elzen WPJ, Jansen APD, Kempen GIJM, Steunenberg B, Steyerberg EW, Olde Rikkert MGM, Melis RJF on behalf of the TOPICS-MDS Consortium. The development of The Older Persons and Informal Caregivers Survey Minimum DataSet (TOPICS-MDS): A large-scale data sharing initiative. PLoS ONE. 2013:8(12):e81673.