Reviewer’s report

Title: Effectiveness of a decision aid for promoting colorectal cancer screening in Spain: a randomized trial

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Reviewer: Lucia Sacchi

Reviewer's report:

This paper describes the results of a randomized control trial to assess the effects of the use of a decision aid for promoting colorectal cancer screening. The study considered two medical centers in two different areas with different characteristics in terms of screening policies.

Although the final goal of the paper is very interesting, unfortunately the study has several limitations, the most important being the low sample size and the impossibility of evaluating the actual screening uptake assessment. The use of the intention to be screened as a proxy of the screening uptake seemed not to be appropriate in this specific population. In addition, the presentation of the methodology and of the results should be improved and clarify in several points.

In the Method section, it is important to describe all the parameters that are collected in the study, and the moment of the study when these are collected for the two patients' populations (control vs intervention). In particular:

* It is not clear what are the "questionnaires" that are given to assess the outcome variables, mentioned in the first part of the Method section. At this point of the paper, the authors have not yet mentioned what will be the outcomes of the study, and they still have not introduced the DA

* The DCS questionnaire should be better described, first of all giving a definition of Decisional Conflict, and explaining why this measure is appropriate as the primary outcome of the study. In addition, the paper should specify when this questionnaire is administered to the study population, and specifically to the intervention group: is it administered both before and after the delivery of the DA? Finally, the DCS includes several sub-sections, which are then used separately for results evaluation. The paper should include the number of questions in each of the subsections and the possible range of the scores for each one (is it normalized as the global score? Is it the raw score given by the sum of the single questions scores?).

* The DA should be described in more detail, especially because the available web version is only in Spanish and it could be difficult to understand for the readers. It is important to underline that the questions about knowledge on CRC and its screening options are included
in the DA (if I understood correctly by looking at it) for the intervention group, and they are repeated twice, before and after the patient is informed. As regards the knowledge questionnaire, it should also be made clear how this is delivered to the control group (on paper? Together with the DCS?)

* The characteristics of screening that are assessed for importance are not detailed at all. They must be listed and, also in this case, it should be specified if these questions are included in the DA for the intervention group, or how they are administered to the two groups.

The statistical analysis section should be better detailed as well. Stating that "we performed several analysis of variance" is too vague, especially because the study has two populations and two centers that are considered, so different effects need to be considered. When talking about the comparison between the intervention and the control group, it is important to have previously clarified when the measurements are collected. For example, comparing the knowledge score between the two groups considering the score for the intervention group collected before the DA was administered can help to assess the baseline, while using the knowledge score of the intervention group after the DA might help clarifying how the knowledge has improved thanks to the information received.

As regards logistic regression, there exist several techniques able to automatically select the variables during the learning phase (stepwise regression, lasso). It is not clear why the authors have decided to manually select the features instead of using an automatic method.

The fact that in center B patients had already been invited and reminded for screening (and thus probably already informed) affects their knowledge and information level, as well as their intention to be treated (as it is shown by the results). This is a selection bias that might influence the obtained results, as the patients had already been exposed to the intervention, and I think this affects the overall results of the study. It would be important to understand how much information they were provided with during the first contacts, and if they had personally provided to collect information about the disease and the screening program. As regards the evaluation of the concordance among the expectations of the patients and their intention to be treated, it could be useful to include the center as a correction variable in the logistic regression.

The fact that the intention to be treated for patients belonging to center B seems not to be different from that of patients in center A and that the number of patients who stated their intention not to be screened is very low, makes me wonder how appropriate is this measure as a
proxy of the screening uptake measure in this specific sample. The authors should better discuss this point.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

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