Reviewer’s report

Title: Development of the Informed Choice in Mammography Screening Questionnaire (IMQ): Factor structure, reliability, and validity

Version: 2 Date: 25 Jul 2018

Reviewer: York Hagmayer

Reviewer's report:

Review PSYO-D-17-00088R2

I'm grateful to act as a reviewer for this manuscript again. I appreciate the revised background and methods section that are very accessible to readers now. For this review, I will focus only on the results section and conclusions.

The authors do an excellent job in running and reporting the planned analyses. At first sight, the findings seem to be mixed as only the attitude scale turned out to have good psychometric properties. However, I would like to go back to the primary aim of the authors. Their primary aim was to develop and evaluate an instrument to assess informed choice in mammography screening. According to their definition, informed choice requires sufficient knowledge, and a behavioral intention that is in line with the person's attitude. Hence, an instrument would have to provide a reliable and valid assessment of attitude, knowledge, and intention. The results show that this is the case for attitude. Good factor loadings, good model fit, good reliability, and a positive relation to behavioral intention were established empirically. Intention is basically measured with a single item. The only empirical result reported by the authors is that intention is related to actual participation (r=.54), which is good. There is no information on re-test-reliability.

The IRT analyses for the knowledge index showed that after removing a single item, the scale is unidimensional, which is good. On the negative side, the results also show that a 2 parameter model, which allows for differences in discriminability, is needed to account for participants' responses. As the authors point out themselves (p. 15) this finding indicates that a summary index is not appropriate to assess women's knowledge. But this is what the authors proposed (summary index >3 = sufficient knowledge, p.8)). I think it is important to discuss this point in more detail and show what would be required to appropriately assess women's knowledge.

Going beyond their primary aim, the authors also assess two additional factors (norms and barriers) that are important according to models describing the formation of behavioral intentions (e.g. the theory of reasoned action). It turned out that the scale for barriers was not reliable, discrimination indices were poor, but the model fit was acceptable. To my surprise, it turned out that barriers were positively(!) related to behavioral intention. I cannot make sense of this finding (more barriers lead to higher intention to participate ?). But I might have missed some recoding going beyond what was described on page 8. If the relation is in fact positive, I think the whole scale needs to be questioned.
With respect to norms, the results show a good internal consistency, but a not so good model fit, despite acceptable factor loadings. In the discussion, the authors report that there were many missings, which might have affected the results. In addition, I would like to point out that there was apparently very little variance. In general a vast majority of people giving advice seem to provide a positive recommendation for screening. The low variance may be one reason for the rather low correlation of norms and behavioral intention.

Given that barriers and norms are not an integral part of informed choice, and the respective scales have some problems, I wondered why these scales are part of the new instrument. I see that it would be of practical value (e.g., for GPs) to assess the barriers a woman encounters and the advice she receives. For research purposes, it would also make sense to keep these scales. But they are not necessary to assess whether a choice was informed or not. I think it is important to make this clear in the paper.

Minor Points

Given that missings might cause problems for the statistical analyses, more information on their number would be helpful.

Table 1 provides an excellent overview. I think it would even be more helpful, if Cronbach Alpha and factor loadings would also be added to the Table. This way, everything would be depicted at a single spot. Thereby, the figures for the factor loading could be omitted.

On page 11 the authors say that they expected intention to have a low correlation with attitude, barriers, and norms. This was surprising to me. The theory of reasoning action, which the authors cite as a background, would not do so. Especially with respect to attitude, it seems strange to expect a low correlation. If the correlation would be low, informed choice would be expected to be rather rare even when women have perfect knowledge.

In Table 3 the authors report correlations of attitude, barriers, norms, knowledge, and intention. It would be very interesting to include the correlations to actual take-up of screening into the table.

In addition to the correlations reported in Table 3, it would be interesting to see how well attitude, norms, and barriers taken together predict intention (e.g., by running a logistic regression). Given that the scales have a low correlation, they may predict intention quite well.
Are the methods appropriate and well described?  
If not, please specify what is required in your comments to the authors.

Yes

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

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?  
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?
If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal