Reviewer’s report

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

Version: 0 Date: 05 Mar 2018

Reviewer: York Hagmayer

Reviewer's report:

The present review is a results-free review.

The aim of the IMQ is to assess the level of informed choices in mammography screening (page 4). According to the authors, it has been developed in the context of a large research project. Thus it is a research tool, which is based on the theory of reasoning action. It has four subscales (attitude, knowledge, barriers, and norms) which should be related to women's intention to engage in screening which in turn should be predictive of actual choices according to the underlying theoretical model. Therefore, the IMQ also inquires about women's intention to engage in screening. Based on the results of the questionnaire and clearly defined criteria it can be calculated whether a decision can be classified as an informed choice or not (page 5).

Methods

The questionnaire is based on the theory of reasoned action and previous questionnaires on informed choice. Thus, it is has sound theoretical and empirical basis.

Sample

The sample, upon which the evaluation of the questionnaire is based, is extremely large and in principle representative of the target population (women 50 and older eligible for mammography screening in Germany). Whether the actual sample of participants is biased or not cannot be judged without any results on demographics. It might be problematic, though, that the authors decided to eliminate women from the sample that did not opt for the MSP or no screening at all. How large the resulting risk of bias is cannot be judged.

Statistical Analyses

The authors plan to run a maximum likelihood confirmatory factors analysis on the subscales attitude, norms, behavior. They intend to compute model fit indices to evaluate the scales. This is
a well chosen method. Results on the knowledge subscale shall be analyzed with a 2 parameter model of the item response theory. Again this a very adequate procedure. However, it is important to note that the knowledge index calculated by the authors is only a sufficient statistic of participants' knowledge if the results can be described by a 1 parameter model (a so called Rasch model). Thus, the authors may want to test whether a 2 parameter model is necessary to describe the data adequately. If it is, they may have to rethink their summary index.

Reliability shall be assessed through Cronbach's Alpha. Given that the IMQ is not a diagnostic test, the proposed cut-off makes good sense.

Validity shall be assessed through calculating correlations among the subscales and the intention to engage in screening. The expected low correlations would be an indicator of discriminant validity. They are, however, no indicators of convergent validity. There are two subscales for which assessing criterion validity seems to be most crucial: Knowledge and Intention to participate in screening. The items of the knowledge subscale seem to have high face validity, but it is unclear whether the midpoint of the summary index is a good criterion for having sufficient knowledge. An external criterion might be interesting at this point (e.g. subjective feeling of having enough knowledge). The authors seem to have respective data available. The Intention to participate in screening should be validated. While studies on the theory of reasoned action in general find decent correlations among intention and action, this is not the case in all studies. Thus, external validity should be established at this point. At present, I do not know whether the authors collected respective data.

Summary

Overall, I think the methods are sound and the IMQ will be a useful and well-evaluated instrument for investigating informed choice.

**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.

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