Reviewer’s report

Title: Validity and Reliability of Evidence Utilization in Policy-making Measurement Tool (EUPMT)

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Reviewer: Sue Brennan

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Peer review by Sue Brennan of manuscript: Validity and Reliability of Evidence Utilization in Policy-making Measurement Tool (EUPMT)

This paper reports development of a new measure of capacity and intention to use research. Based on the theory of planned behaviour, the study builds on earlier work by Boyko and colleagues, and a well-developed body of theory, to generate a new tool of importance to those interested in understanding how best to support the use of research in policy making. Overall this study has the potential to make a useful contribution underpinning future research in the area. The study is notable because it was conducted in an understudied setting, where research could play an important role in ensuring limited resources are distributed in the most effective way. However, the paper does require some substantial editing for clarity. I have made specific suggestions below for the background, methods and results; editing of the discussion is also needed. Finally, the results of the paper rely heavily on the conduct, reporting and interpretation of factor analysis, which I feel require statistical review.

BACKGROUND

Some minor editing, as follows, would increase the clarity of the background.

Page 4, Line 3: Suggest editing to a slightly more conservative statement 'may lead to' (rather than leads to)

Page 4, line 4: Suggest change from 'encouraging … toward' to 'increasing ... health systems policy makers and managers awareness of ...'

Page 4, line 8: Suggest change from "difficulty in changing policy-makers' behaviour before and after the interventions" to "difficulty in measuring policy-makers' research-use actions before and after interventions ...". This will tie the argument more to the purpose of the paper.

Page 4, line 13: Suggest changing from: "has been the theoretical method predominantly employed" to "has been widely used to study health related ..."
Page 4, line 23: 'explain' rather than 'determine'

Page 4, line 40: I don't understand what is meant by 'and then their outcomes'.

Page 4, line 53-4: I don't think the statement about Boyko et al's test of their TBP measure is completely accurate. Boyko et al reported test-retest reliability and internal consistency, but stated that validity could not be assessed. Please check and correct to ensure consistent with what Boyko et al reported.

Page 4, last paragraph: This paragraph needs some editing to ensure it is clear whether the authors are referring to, i.e. is it Boyko et al's study or their own study? Suggest replacing with 'Boyko et al' for the former and 'our' for the latter.

Page 4, line 60: "The designed tool may be employed". Suggest editing this to state as an aim, rather than a conclusion (which pre-empts whether the tool is suitable for the measurement purposes listed here). ie. "Our aim was to design a tool that may be employed". Also, it would be helpful to state what is meant by 'determine the status quo'. Determine current beliefs and intentions about using research to inform policy?

Page 5, line 1: As above, edit "The results of this study can effectively help" to reflect that this is your aim.

METHODS

Page 5, lines 13-14 (and abstract): specify country.

Page 5, lines 33 and 36 (and abstract): Edit to clarify whether "number of eligible individuals" and "all of them were included in the study" refers only to the sampling frame/number of individuals invited to complete the survey ("included in the study" suggests you have data for all 373 and that the sample may have been larger than this).

Page 6, ethical considerations. Suggest including more information about the ethics/consent processes, specifically, consider reporting:

- an ethics approval number for the project if you have one
- whether participants were required to consent, if so describe the consent process
- whether respondents received information about the purpose of the survey and how data would be used, confidentially provisions etc.

Page 6, line 21-22: The process described is unclear to me. Should this read "57 questions were generated from qualitative data to develop a tool which was subsequently assessed for face and
content ...'. In addition, if this data came from interviews/focus groups, perhaps state the source of the data (generated from analysis of interviews ...).

Page 6, line 29: perhaps change to "validities of the questions and rated them as 'completely ....undesirable' ....". Then new sentence "Respondents were asked for their opinions on how the face validity of questions could be improved".

Page 6, line 32-3: please provide a reference for the methods involving calculation of "Content Validity Ratio (CVR) and Content Validity Index (CVI) indicators".

Page 6, line 39: I'm not sure what is meant by "The quantitative results were finalized" - "The questionnaire was revised by three panels of experts based on ..."

Page 6 line 42: please be more specific about the skills held by those described as "renowned researchers"; i.e. "researchers with expertise in ...".

Page 6, line 46-7: the description of construct validity is unclear. Maybe revise to: "Construct validity shows the extent to which observed scores on the tool are as predicted by the theories upon which the tool was based." Then "Accumulation of evidence about the face, divergent, convergent, and discriminant validities of a tool is used to provide evidence about construct validity".

Page 6, line 50-1. Further, the definition of convergent and discriminant validity is not entirely accurate. It is true that factor analysis can be used to provide evidence of convergent and discriminant validity, but in itself this is rarely considered sufficient. Perhaps rephrase to "Evidence of convergent validity can be demonstrated by showing positive and significant correlation between scales scores for constructs that are expected to be related. [same applies to divergent validity]"

Page 7, line 11: the authors mention comparison of observed values with "acceptable values". The latter should be specified and referenced (e.g. correlation coefficients of ..., ICC of ...).

Page 7, line 19. It was not clear to me which tests the following sentence refers to "The response rates in the two aforementioned phases". Please specify the response rate (RR), total number of respondents/number invited for both the factor analysis, and test-retest analysis.

Page 7, line 19 and line 40: in addition to reporting % RR, please specify the number of respondents/total number invited. Similarly, not clear what test "The response rate was 92.76%." refers to (RESULTS line 1).

RESULTS
The results of reliability testing (test-retest and internal consistency) appear not to be tabulated, or reported in the results section, yet they appear in the abstract, methods for assessment are described, and the results are interpreted in the discussion. I may have missed this information, otherwise please report these results in the results section.

Page 7, line 42-3: suggest changing to "27 individuals did not return their questionnaire".

Page 7, line 60: two decimal places is sufficient

Page 8, line 3-4: Suggested deleting "Eventually, the face and content validity and reliability of 54 questions were confirmed."

Page 8, line 18-9: Not sure what this means "However, the correlation of 7 of the variables had no theoretical justification with the theory's constructs." Seven variables showed correlations not predicted by the theoretical model? Or correlations predicted by the theoretical model for seven variables were not observed?

Page 8, line 24-5: The authors have made some assumptions throughout the results about the interpretation of correlation coefficients, such as is described here "was greater than 0.5, hence, confirming their convergent validity". It would help to include a section in the methods which specifies the thresholds considered as demonstrating convergent and divergent validity, especially given the complexity of this interpretation (i.e. it is desirable that constructs are sufficiently correlated that they are shown to be related, but not so much that they cannot be discriminated from each other).

Overall comment. Testing a measurement instrument involves accumulating evidence that supports validity/reliability, and no single test "confirms" validity/reliability. For this reason, I suggest editing throughout the results and discussion to reflect this, for example change "discriminate validity was confirmed" to "providing evidence of discriminate validity".

Page 8, line 39-40: suggest changing "Eventually, the validity and reliability of the tool was confirmed with a total of 40 questions." to "After refinement, the final version of the tool had 40 questions."

DISCUSSION

Overall, some of the information in the discussion seems a better fit for the results section (e.g. the second paragraph on p9 that details results of the CFA). While I appreciate that it is difficult to describe findings from factor analysis in simple language, shifting technical information to the results might improve the discussion. It would help those wanting to use the tool to focus the discussion on the implications of the results (rather than describing results). For example, do the scales identified from factor analysis support the TPB model, does their content make sense
(have face validity), are there implications of dropping items or including them in scales for which they were not originally intended?

Page 8, discussion. The first sentence needs revision/simplification. It is probably sufficient to say the validity and reliability of the instrument were examined using factor analysis and test-retest reliability. Here and in the second sentence, I think 'determined' should be changed to 'examined'; similarly in the third sentence 'used for the…' should read 'used to examine the construct validity.'.

Page 8, line 58-9: I'm not sure where the 'meeting with experts' was described in the methods: "thus, it was improved upon setting up a meeting with experts." I couldn't see any other mention of a meeting - perhaps this was part of the process to determine face/content validity. If so, using consistent language would help the reader make this link.

Page 10. The authors note "One of the strengths of this study was its high response rate." I agree that the response rate is pleasingly high for a study/participants of this type, and wonder if the authors might be able to comment on factors they think may have motivated participants to respond?.

Page 11. The manuscript would benefit from some discussion of the limitations of the study, and more description of testing that could be done to generate evidence of the instrument's measurement properties (e.g. examining how scale scores relate to scores on other instruments to which this new measures is expected to relate).

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An article whose findings are important to those with closely related research interests

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Please indicate the quality of language in the manuscript:

Not suitable for publication unless extensively edited

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