Author's response to reviews

Title: Assessing awareness of colorectal cancer symptoms: Measure development and results from a population survey in the UK

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Version: 2 Date: 20 May 2011

Author's response to reviews: see over
20\textsuperscript{th} May 2011

Dear Dr Chap,

RE: 3659665214765637 - Assessing awareness of colorectal cancer symptoms: Measure development and results from a population survey in the UK.

We should be grateful if you would re-consider this paper for publication in \textit{BMC Cancer}. We very much appreciate the reviewer’s comments on our manuscript and your helpful critique. We believe that the paper is much improved and hope that the revisions we have made will answer your queries. We have detailed our responses to the reviewers’ comments and your suggestions below.

\textbf{Editorial requests}

\textit{Ethics}

Research that is reported in the manuscript must have been performed with the approval of an appropriate ethics committee. A statement to this effect must appear in the Methods section of the manuscript, including the name of the body which gave approval, with a reference number where appropriate. If the need for ethical approval is waived, this should also be clearly stated in the methods section.

We have now stated in our methods section that the need for ethical approval for both Studies 1 and 2 was waived. The UCL ethics committee regard surveys or interviews as exempt from ethical approval as long as participant data is non-identifiable (see their wording below).

\textit{Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behaviour UNLESS information obtained is recorded in such a manner that human participants can be identified AND any disclosure of the human participants’ responses outside the research could reasonably place the participants greater at risk of criminal or civil liability or be damaging to the participants’ financial standing, employability, or reputation."

\textit{Questionnaire}

Please provide all questionnaires used in this study as additional files.

We apologise for not including this and have now provided a copy of the Bowel/Colorectal Cancer Awareness Measure as an additional file.

\textbf{Referee 1:}

Discussion of the implications of validating the Bowel CAM using a self-administered survey and population estimates based on interviewer administered surveys would be helpful.

Thank you for raising this issue, we now note on page 21 that; “It should also be acknowledged that the Bowel/Colorectal CAM was administered using computer-assisted personal interviews (CAPI), a method which had not been utilised in the validation of the measure. CAPI combines the benefits of face-to-face interviewing, such as encouraging longer responses to open-ended (unprompted) questions while minimising some of the
disadvantages, such as social desirability bias and reluctance to disclose sensitive information. Nevertheless, further research is needed to understand the impact of delivery mode on the reliability and validity of the Bowel/Colorectal CAM.”

Essential Revisions:

1. The paper presents findings from 2 different studies and the writing style is quite repetitive with information often repeated in the methods section and the results. Descriptions of the Bowel CAM are repeated in studies 1 and 2 although the terminology is inconsistent between study 1 and 2 (e.g., open and closed items vs. prompted and unprompted items).

   We have tried to minimise the repetition of information about the Bowel/Colorectal CAM where possible and have now ensured that we are using consistent terminology to describe “unprompted” and “prompted” items throughout the paper.

2. In Study 1 it is not clear whether open and closed questions were combined and whether all items received the same weight. It is not clear whether the same scoring algorithms were used in the two studies. The CAM should be described once (including a description of how CAM scores and subscales were generated) and consistent terminology used in describing results from the two studies.

   We have now incorporated a thorough description of the scoring used for the Bowel/Colorectal CAM (which relates to both studies) into the methods section of Study 1 (see page 8/9).

3. References should be provided for methods (e.g. known groups’ method) and for the cutoffs used to assess various performance characteristics of the Bowel CAM.

   We have now included the appropriate references for the specific methods and cut offs used in our validation analyses;

   “When using Cronbach’s alpha, a minimum score of 0.7 is needed for a questionnaire to be considered reliable (Bland & Altman, 1997) and the results were good, with a Cronbach’s alpha of 0.84 for the whole questionnaire, 0.73 for prompted warning signs and 0.79 for the prompted risk factors subscale.” (Page 11)

   “Construct validity is supported when a questionnaire can discriminate between a group of individuals known to have higher levels of bowel cancer knowledge and a group who do not (DeVellis, 2003).” (Page 12)

4. The statistical tests used to assess various instrument characteristics should be specified in the methods section.

   We have now explained which statistical tests were used in the validation studies:

   “Validation of the Bowel/Colorectal CAM included analysis of test-retest reliability using Pearson’s correlation; internal reliability was assessed using Cronbach’s alpha; specific item analyses (item difficulty and item discrimination analyses) were analysed by examining simple descriptive statistics (e.g. percentages) and construct validity and sensitivity to change were analysed using Chi-Square and t-tests.” (Page 11)
Study 1

5. Basic demographic information (age group; gender; educational attainment) should be provided for all three samples and could easily be added to Table 1.

We have now added demographic information to Table 1 (see page 32).

6. It is not clear why n=35 from sample 2 for the item difficulty assessment while all 70 were used from sample 2 in other analyses. If it is only the control group this should be stated.

Thank you for pointing this out, we have now made it clear that it was only the control group from Sample 2 that were used to assess item difficulty:

“Item difficulty was assessed using results from Samples 1 (n=49) and from the control group from Sample 2 (n=35) on all items where it was possible to ascertain a ‘correct’ answer.”

(Page 12)

7. Why were two items excluded from the assessment of internal reliability as ‘they did not relate to overall awareness’ was this determined by some type of analysis or was it planned a priori?

The items on help seeking and confidence in detecting a symptom were included in the Bowel/colorectal CAM because they provide some indication of behavioural response to symptom detection and perceived self-efficacy related to symptom detection rather than to measure awareness of CRC more generally. As a result, we do not believe that these items should be included in the assessment of the internal reliability of the survey and this was planned a priori. We have now added an explanation for this into the manuscript (see page 11).

8. More detail should be provided in some instances, for example, were the 16 experts who reviewed the items for the scale included in the 16 experts used in Sample 3 to evaluate the questionnaire? Were any experts in cancer education and/or public education included in the expert panel which generated the items?

Sample 3 included 16 experts who worked for two charities committed to raising awareness of bowel cancer (Beating Bowel Cancer and Bowel Cancer UK) and were different from those that helped to generate items and review the Bowel/Colorectal CAM who had specific expertise of the disease and included: a medical oncologist, a consultant clinical oncologist, a lead consultant for general surgery, a consultant general surgeon, a gastrointestinal and colorectal consultant oncologist, and a colorectal surgeon. We have added this detail to the manuscript (see pages 10 and 7).

9. What was the planned time frame and justification for the test-retest evaluation?

We have now inserted the following paragraph into the Methods section (see page 9).
“Test-retest reliability assesses the consistency of a measure over time and is therefore dependent on the stability of the measured construct, in this case, awareness of CRC. It was therefore important to leave adequate time to ensure that respondents did not recall their previous responses to the Bowel/Colorectal CAM, while minimising the likelihood that their knowledge about CRC changed during the intervening period.”

Discretionary Revisions
Study 2

10. Tables 3 and 4 could be used to provide results on important subgroups (e.g., men vs. women, SEG groups) in order to provide the reader with more information and to allow the text in the results section to focus on trends in the findings.

While this is a good suggestion we believe that the overall levels of awareness of specific symptoms and risk factors will be of greater interest to BMC Cancer readers than demographic differences in total scores.

11. Several acronyms should be explained and explanations provided (e.g., NICE, SES categories, ITV), particularly for readers not familiar with the UK setting.

Thank you for bringing this to our attention, we have now added explanations for these acronyms.

Referee 2:
Discretionary Revisions

12. Overall, the study designs to validate the CRC CAM appear adequate and the authors have already discussed their limitations in terms of various modes of testing and limited demographic representation. However, the number of study participants included in the validation samples is small (49 for sample 1 and 70 for sample 2, which was divided in half for educational intervention). The combined samples 1 and 2 to assess internal validity have a large number.

Thank you for raising this issue, we have added this to the limitations of this study (see page 14).

13. It would be interesting to see (1) if there’s any correlation between the level of awareness of CRC symptoms and risks and the level of education in study participants and (2) whether the level of education in study participants exerts any impact on intervention (especially in the unprompted questions). Social Economic Group (SEG) was extensively discussed but the correlation between SEG and education level can only be inferred and not explicitly stated.

Awareness of signs and symptoms was positively associated with awareness of risk factors for CRC and as is already discussed in the paper, higher social grade was consistently associated with greater awareness. This relationship is seen for both unprompted and prompted questions and has been demonstrated in previous CAM papers (e.g. Robb et al, 2009).
While we agree that it would be interesting to explore the relationship between SEG, education and awareness further, given the current length of the manuscript, we think it is beyond the scope the paper.

Minor Essential Revisions:

14. In the segment about women and their awareness of CRC risk factors, the percentage of their awareness (vs. men’s) might have been reported in a reverse fashion for the symptom of ‘pain in the back passage’ (Results section, page 15).

Thank you for noticing this, we have corrected this typo (see page 18).

We believe that we have now addressed all the reviewers’ comments along with your own, and we hope you will find the manuscript improved.

We look forward to hearing from you.

Yours sincerely,
Emily Power