Author's response to reviews

Title: Barriers to research utilization and research use among registered nurses in the care of older people: Does the BARRIERS Scale discriminate between research users and non-research users on perceptions of barriers?

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Version: 2 Date: 19 January 2008

Author's response to reviews: see over
Dear Editor,

Here is our reply to the reviewers’ comments regarding our manuscript no. 224848521561835 "Barriers to research utilization and research use among registered nurses in the care of older people: a cross-sectional survey" by Anne-Marie Boström, Kerstin Nilsson Kajermo, Gun Nordström and Lars Wallin. The major concern was the unclear purpose of the paper. We realized that two of the reviewers interpreted our paper in the way that the aim was to identify predictors to research use. Thus, they underlined the importance of using multi-variate regression analysis and controlling for confounding variables and intercorrelation between independent variables. However, our purpose was, and still is, to describe RNs’ perception of barriers to and facilitators of research utilization and to examine the validity of the BARRIERS Scale in relation to research use. We have made that much clearer in this revised version. Therefore, we would like to change the title of the paper to: Barriers to research utilization and research use among registered nurses in the care of older people: Does the BARRIERS Scale discriminate between research users and non-research users on perceptions of barriers?

The issue of significance level was raised in the letter from the editorial team. We have revised and decreased the number of statistical tests and we believe that a significant level of 5% is now adequate.

Please, find our responses to reviewers comments in the following:

Reviewer Ania Willman (R1)

“The rationale for this study is not that clear. The purpose is clear but the argument that lead to the purpose is unclear. If we know there is a gap (between what is known and what is done in practice) and we know that there are barriers – why do you then have to examine if perception of barriers is associated with reported use of research findings? Further down in the text (bottom of page 3) it appears that you also wanted to investigate the underlying assumption of the BARRIERS Scale. There is also a glimpse of this at page 4 in the lines before Methods. I get the flavour of a paper with more of a methodological character than what is described in the purpose. If you could express this more clear in the purpose I think it will add value to the paper.”

We have refined the aim/purpose of the study (page 3). It is twofold, (1) to describe RNs’ perceptions of barriers to and facilitators of research utilization and (2) to examine the validity of the BARRIERS Scale in relation to research use, i.e. the capacity of the Scale to discriminate perceptions of barriers between research users and non-research users.

“My second concern is about the statistics, in your abstract you use the word association, also at page 4 “perceived barriers are associated with reported research
use” and on page 7 you use the word correlation (correlation was found between the respondents scoring ...). As to my knowledge there is a slight difference between the words and I prefer to use associated in this context.”

We used the word ‘correlation’ because of the statistical test the result came from, Pearson’s product moment correlation coefficient. We think that is an appropriate use of terms.

“In Table 1 the Total n=140 and if I add Research users with Non research users I get 134. I miss data from 6 persons? And can not find any explanation for this in your manuscript.”

In the paragraph Data analysis (page 5) we have explained that six of the 140 respondents did not answer some of the items within the RU-index, thus we could not use them in the correlation analysis. We have added a footnote re this issue to the tables 3 and 4.

“My last comment is on the references that are available in Swedish.”

We have added (In Swedish) after the references that are in Swedish.

Reviewer Anne Sales (R2)

“The main dependent variable, research utilization, should be regressed on the four subscales and “background” (demographic) variables. This is not complicated, and is standard in the literature.”

Due to the previous unclear purpose of the paper, we believe the reviewer perceived it as we were investigating associations between research use and barriers, and therefore multivariate regression analysis should be applied. Our purpose is not to identify predictors of research use and that is the reason why we not use multivariate statistical procedures as suggested. Our purpose is to examine the validity of the BARRIERS Scale by investigating the Scale’s capacity to discriminate perceptions of barriers between research users and non-research users. Thus, our use of Student’s t-test and Pearson’s product moment correlation coefficient should be appropriate.

Reviewer Judith A Ritchie (R3)

“1. Throughout the paper there are unexplained differences in the ‘n’. While a total of 140 responded to the survey, some of the ‘n’s listed in Table 1 are as low as 50. The same discrepancy exists in the text. It is therefore difficult to determine what numbers are actually used in the calculations of the means and statistical analyses. It does not seem appropriate to test between group difference on items when the numbers vary so greatly.”

The reviewer highlights an important issue. As in many other BARRIERS Scale studies, many respondents used the ‘no opinion’ response alternative, particularly on the items in the Research subscale. According to Funk et al.’s recommendation, the ‘no opinion’ responses are not used in the calculation of the subscales (see the BARRIERS Scale paragraph page 4 line 38-39). By showing the numbers of respondents that replied on each item (Table 1) we have not hidden any information for the reader. We think the lack of responses (or the high number of respondents using the no opinion response) on the subscale Research is a finding by itself.
Furthermore, we agree with the reviewer’s comment on testing group differences on item level. We have decided to not perform these analyses. We believe it is more appropriate to only examine the Scale’s validity by analyzing the subscales of the BARRIERS Scale (i.e. the four summated scales of the BARRIERS Scale). Through this decision we have also decreased the number of statistical tests.

“2. The description on page 5 of the scoring for the BARRIERS Scale makes no reference to calculation of a percentage response. However, in the analysis section reference is made to analysis of proportions and in Table 1 percentages are reported for each item of the scale. It is not clear what these percentages mean.”

The following text about this calculation is added in the Data analysis section page 5:

“To describe the RNs perceptions of barriers, the 4-point scale was dichotomized by merging the respondents who answered the two response alternatives 3 and 4 into one category representing respondents reporting more barriers to research utilization. The respondents who scored response alternatives 1 and 2 were merged into a second category expressing fewer perceived barriers.”

“3. The analysis does not include any correction for multiple comparisons and there are 34 comparisons presented in Table 1 alone.”

This is a correct comment and we have greatly reduced the number of statistical tests. We have chosen to only investigate the three background variables age, educational background (i.e. nursing program at university level) and work place, while the literature report equivocal findings on the relationships between these background variables and perceptions of barriers. Furthermore, we have removed all statistical analysis on item-level. Thus, we believe that a significant level of 5% is adequate.

“4. Page 9 end of the first partial paragraph – reference is to Damanpour in relation to statement about working in specialist settings enhancing research use. However, Damanpour is about innovation and refers neither to research use or specialist that I can find. This link needs to be made more explicitly.”

We have a new reference for the link between working in specialist settings and research use. This reference is Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O: Diffusion of innovations in service organizations: systematic review and recommendations. Milbank Q 2004, 82:581-629. These authors claim that “an organization will assimilate innovations more readily if it is large, mature, functionally differentiated (i.e. divided into semi-autonomous departments and units), and specialized, with a foci of professional knowledge”. (page 604)

“5. Page 10 line 4 – section beginning with ‘To further explore..’ to the end of the sentence (Table 1) – repeats earlier statements.”

We have removed the part of the sentence that repeated the dichotomy of the sample. The current sentence (page 8 line 42) has following wording:
“The statistical analyses demonstrated that the Scale detected certain differences between research users and non-research users.”

“6. Page 10 11th line – sentence beginning ‘Further more, the lack of consistent differences’ is unclear. How does this inconsistency undermine the usefulness of the scale?”

We interpret the lack of significant correlation between the RU index and the Setting subscale as an indication that the BARRIERS Scale is not valid in relation to research utilization regarding this subscale. The lack of significant and consistent difference between research users’ and non-research users’ scoring on the Setting subscale adds to the interpretation of the lack of validity. Therefore we propose that this “lack of difference between the two groups on the predominantly reported Setting subscale undermines the validity of the BARRIERS Scale to identify organizational barriers to research utilization” (page 9). The problems with the Scale’s construct and content validity have also been highlighted by Gerrish et al (2007).

“7. Page 2 – last full sentence beginning ‘Increased knowledge in geriatrics….’ No reference is provided for this very certain statement.”

In the following reference (which is added), Larsson K, Thorslund M: Chapter 8: old people’s health. Scand J Public Health Suppl 2006, 67:185-198 the authors highlights that “new and more effective drugs have been developed and that new treatment principles afford opportunities for effective treatment of more diagnoses, even among the very oldest.” (page 194)

“8. Page 7 and elsewhere – Phrase “older nursing program” – not clear what this means. I suspect that it means non-university program or program prior to 1982. This should be clarified.”

In the section Description of the sample (page 6) we have added that [RNs] “completed a nursing program at university level, i.e. educated after 1982, which means that research methodology and nursing science were included in the curricula” as a clarification.

Judith A Ritchie has also provided us with additional comments concerning language use. We are grateful to her comments and we have revised the manuscript according to her suggestions.

Sincerely,

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