Author’s response to reviews

Title: Predictors of physicians' stress related to information systems: A nine-year follow-up survey study

Authors:

Tarja Heponiemi (tarja.heponiemi@thl.fi)
Hannele Hyppönen (hannele.hypponen@thl.fi)
Sari Kujala (sari.kujala@aalto.fi)
Anna-Mari Aalto (anna-mari.alto@thl.fi)
Tuulikki Vehko (tuulikki.vehko@thl.fi)
Jukka Vänskä (jukka.vanska@laakariliitto.fi)
Marko Elovinio (marko.elovainio@thl.fi)

Version: 2 Date: 20 Feb 2018

Author’s response to reviews:

20.02.2018

Dear Prof. Pfaff,

Enclosed, please find our revised manuscript "Predictors of physicians' stress related to information systems: A nine-year follow-up survey study." We highly appreciate editor’s valuable comments. We have now revised the manuscript following these comments. We are willing to do additional changes if necessary. All the changes are made with the track changes mode.

A detailed description of the revisions is included on the following pages. We hope that our revised manuscript is now acceptable for publication in BMC Health Services Research.

With Best Wishes,

Tarja Heponiemi
COMMENT: - Karasek’s model has been included as a conceptual basis. The authors use it to explain potential stress in physicians in relation to IS use. But I don’t understand how the job demand and control model relates to physician stress, since I think that physicians do have a job with high control therefore according to Karasek are not at risk of stress.

RESPONSE: We have removed Karasek’s model from the manuscript and elaborated more thoroughly Information chaos theory

COMMENT: - most readers will not be familiar with information chaos theory and therefore, a better explanation of its relevance for the article is needed.

RESPONSE: As suggested, we have elaborated information chaos theory more thoroughly and hope that its relevance to the manuscript is clearer now, it now says

(page 5) “Physicians’ work includes complex and demanding activities such as multitasking, clinical reasoning, problem-solving, and a need to deal with vast amounts of information [6, 18, 19]. All of these may cause cognitive workload according to Kirsch [20], who has identified too much information supply, too much information demand, constant multitasking and interruptions as examples of causes of cognitive overload in the workplace. Information chaos theory [6], conceptualizes five information hazards: information overload, underload, scatter, conflict, and erroneous information as information chaos. These hazards are experienced by physicians on a daily basis and can together or separately increase the risk of information-related errors. Information overload occurs when there is too much data for a physician to organize, synthesize, act, or draw conclusion from. EHRs may make the information overload situation worse by encouraging electronic copying and pasting, adding irrelevant information and mixing data. Information scatter occurs when information is located in multiple places and EHRs may worsen this for example because of inadequate search methods and multiple windows.”

COMMENT: - It remains unclear whether the survey instruments have been validated (which goes beyond reliability analyses and associations with other concepts in other studies). Are there validation studies/articles? If not, please state this in your limitations.

RESPONSE: As suggested, this has been added to limitations, it now says:
“The present study relied on self-reported measures, which may lead to problems associated with an inflation of the strengths of relationships and with common method variance. To minimise problems with self-reports we used measures that showed good reliability. However, even though many of our measures have been widely used in scientific articles many of our instruments have not been specifically validated in proper validation studies.”

COMMENT: - Thanks for adding the R² in the regression models. In both models, the stepwise inclusion of constructs did not lead to a substantial increase in explained variance. Please consider and mention that the explanatory power of the constructs added seems to be very low…

RESPONSE: We have added this to our results regarding Table 2. However, regarding Table 3 we considered that because the first step includes baseline level (which to our knowledge always explains very big proportion and leaves quite little to other measures to explain), therefore we consider that the increase in Table 3 (which was much bigger than regarding Table 2) does not need this explanation. However, we can add it in the context of Table 3 if it is seen important. It now says:

(page 12) “However, the explanatory power of the other variables than baseline level and demographics seemed rather low, given that the increase of R2 was low in Steps 2 and 3.”

COMMENT: - Table 2: Please add the cut-off/reference values of the criteria in the table to make it easier for readers to assess the SEM.

RESPONSE: As suggested, We have now added a note reporting the reference values for RMSEA and fit indexes to Table 3. In the text: “Note: RMSEA should be <0.05 and CFI/TFI > 0.90”.

COMMENT: - Figure 1: Now I understand that the authors’ did not use items but scale values in the SEM. For me that is uncommon, but I am not an expert in SEM. Including the items would have allowed to look at the item structure and could have helped to strengthen the reliability and validity of the survey instruments. Why have the authors decided to build the SEM on the basis of scale values instead of item structures?

RESPONSE: We decided to use scale values simply to make the model less complicated comparable to the results obtained from the regression analyses (which were the main analyses of the study). In addition, the scales we used were reliable (Cronbach’s alphas .68-.87) and thus their structural validity acceptable. We also used adjusted values of those scale values and that would make the model rather complicated when tested using only item level SEM.