Reviewer's report

Title: Prognostic factors of a favorable outcome following a supervised exercise program for soldiers with sub-acute and chronic low back pain

Version: 1 Date: 15 Dec 2017

Reviewer: Corey Simon

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The authors have attempted to address most of my concerns, and have scaled back the interpretations of this study. In particular, the revised study aim is to explore potential predictors of the multi-stage exercise program as a means to inform the next iteration of hypothesis-testing trials - and potential development of a CPR. While I consider the revised manuscript improved, I have a few remaining concerns:

1) Given the unavoidable flaws of small sample size, model over-fitting, and non-significant factors in the final model, I'm not sure there is value in attempting to determine predictive capacity by number of criteria. As you have already stated, you're at the stage of generating hypotheses. You've achieved this by looking a correlations with favorable vs. unfavorable response for his intervention. In a subsequent study (with larger sample size and factors determined a priori), you can then consider predictive capacity based on number of criteria.

2) Regarding my initial concern of a subgroup of individuals with acute LBP receiving PT before the program, the authors note that: 1) baseline variables were collected after the participants had received PT for acute LBP, so prior treatments should not affect the present results; and 2) program was not designed for acute LBP. However, this doesn't change the potential for different subgroups in your study based on pain duration and last medical intervention. This is less of a problem if the baseline measures are compared between the group with acute LBP coming off PT (assuming they're now considered subacute) and the rest of the cohort, and found to be similar. Nowhere do I see that comparison, or a test to determine if either group had a propensity for favorable vs. unfavorable outcome. What the baseline measures won't
inform is the extent to which time since medical intervention (and potentially response to that intervention) influence participant expectation of the supervised exercise program - which can affect outcome.

3) Baseline characteristics indicated that the average length of time since the last bout of LBP was 16 months. Does this mean there are individuals that were in the program who had not experienced LBP for months and arrived pain free? Or, is it supposed to indicate since latest onset of LBP? Assuming the latter, but please clarify.

4) Since this study cannot generalize to non-military personnel, I think it's important for the reader to know as much. Please consider aligning your title with the population (e.g. soldiers or military vs. individuals). Also, your abstract conclusion still hints at guiding treatment of non-military personnel. There is nothing wrong with keeping the focus on military. In fact, it would strengthen the manuscript to discuss similar prognostic trials. One example is the POLM trial by Childs et al. (2011, 2014).

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.
No

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