Reviewer's report

Title: Associations between Body Mass Index, health measures and need for recovery in office employees: a cross-sectional analysis.

Version: 1 Date: 7 June 2013

Reviewer: Karen Lamb

Reviewer's report:

This article addresses an interesting topic and is generally well written. However, there are a number of questions I have about the article, particularly relating to the methodology, which I hope that you will be able to address.

MAJOR COMPULSORY REVISIONS

1. Dependent variable

I had difficulty understanding how the outcome measure was defined and used in the analysis and I hope you can clarify some of these issues for me.

a. Firstly, you define NFR as a scale computed by summing up the scores of the 11 items for those who provided data for at least 8 of the 11 items. How did you treat non-response when developing this scale? Can you provide further information about how the scores were transformed to the 0-100 scale?

b. Secondly, you describe a dichotomy for the NFR score, grouping individuals into low or high and only present descriptive statistical information for NFR based on this dichotomy, not for the whole scale. However, you mention that you use linear regression to conduct the analysis which leads me to believe that you treated NFR as a continuous outcome variable. If NFR was indeed treated as a continuous variable in the analysis, please add further clarification in the text as Table 2 makes it appear that the dichotomy was adopted. Did the NFR scale have to be transformed to be used as a response variable? Please provide detail on how you verified the model assumptions.

If, however, you considered the dichotomous response of Low/High NFR, then a linear regression is not appropriate to fit to this type of response and a logistic regression model should be used instead. I would also check how sensitive your results are to the dichotomy you have selected should you adopt this approach over the continuous outcome.

2. Independent variables

a. Body mass index

I would suggest also considering BMI as a continuous predictor for NFR in the analysis. This would increase the sensitivity to detect differences. You mention in the discussion the difficulties with using BMI as a categorical variable so it would seem logical to consider BMI as a continuous predictor.
I would also suggest considering underweight as a category in the analysis and perhaps super obese (if there are sufficient numbers) to see how sensitive your results are to the categories you have adopted.

b. General health and mental health

The same point as raise for the dependent variable: how was non-response treated when developing the scale as individuals only had to provide data for at least 3 of the 5 scores?

You mention general health twice in the methods- once as a health measure to be investigated and once as a potential confounder. It is not clear to me how these two measures differ or what the definition is of the general health measure in the potential confounders section. I believe that the first health measure is a perceived measure so perhaps the second measure is more objective. However, if the data are from self-reported questionnaires, do these two measures differ greatly? Further detail is required of how the general health confounder is defined and how similar it is to the perceived measure.

Did you consider an interaction between BMI and general health?

3. Potential confounders

You used a measure of educational level as a confounder. Did you have information available on job type which could be important? While you mention that all participants are from a financial service provider, you don’t mention whether or not they are of a similar job category. This could potentially be a factor in the analysis and I would adjust for this in the analysis or add a comment about this point if the jobs are all of a comparable nature/skill level.

4. Statistical procedures

In addition to the issues I have with how the response variable was dealt with in the analysis, I struggled with some of the descriptions of the statistical procedures. In particular, the description of expanding models by adding an interaction term between NFR and the respective variables did not make sense to me. Is NFR not your response variable? If so, I don’t understand how you fitted an interaction term with NFR. Some further work is required in this section to detail precisely what models were fitted. Also, it is not clear where the p-value comes from for Table 2 as it is simply entitled descriptive outcome measures. You need to clarify what methods you have adopted in the analysis in this section of the paper.

5. Results

The results section needs a bit of work to clarify the findings of the study.

You put more emphasis on ‘significant’ results than you perhaps should given the fact that p-values are on a continuous scale and that a p-value of 0.05 is simply an arbitrary threshold. In the adjusted analysis of BMI and NFR, the lower confidence limit for obesity is 0.01 and the strength of the association is substantially reduced after adjustment (p-value increased from 0.005 to 0.05).
You should highlight this feature and not overstate your findings.

Clearly, there is much stronger evidence of an association between each of the health measures and NFR than between BMI and NFR since the p-values are <0.001. You should highlight this fact.

Your statement of “No associations with NFR were evident in overweight compared to normal body weight subjects in neither unadjusted nor adjusted models” is not quite right. What you mean is that you have not found strong evidence to support an association between overweight and NFR compared to normal weight.

The writing in this section needs clarification at times. For example, “Unadjusted analyses showed significant associations for obesity and all health measures” is vague. Clarify that the association is with NFR.

6. Table 2

The table title is not informative and needs to be revised. Clarification of what the p-values represent is required.

MINOR DISCRETIONARY REVISIONS

7. General health and mental health

Please state the RAND-36 measure of health related quality of life, rather than simply Rand-36 when you mention this on page 6.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.