Reviewer’s report

Title: Who will increase their physical activity? An examination of the predictors of change in objectively measured physical activity over 12 months in the ProActive cohort

Version: 1 Date: 28 October 2009

Reviewer: Marina M Reeves

Reviewer’s report:

BMC Public Health

‘Who will increase their physical activity? An examination of the predictors of change in objectively measured physical activity over 12 months in the ProActive cohort’

Rebecca K Simmons, Esther MF van Sluijs, Wendy Hardeman, Stephen Sutton and Simon J Griffin

Reviewer’s report

-----------------

This is well written paper reporting on secondary analysis of data from a large physical activity intervention trial. The primary outcomes of the trial have been published previously and reported no significant between-groups difference in the main outcome of objectively measured physical activity (by heart rate monitoring). This analysis looks at the combined sample of those with baseline and 12-month follow-up data (an impressive 88% retention) and aims to identify predictors of change in objectively measured physical activity. An understanding of ‘who’ changes physical activity can help for targeting interventions in the future. There are however a few issues in relation to the analysis of the data which should be addressed for this study to provide an important contribution to the field of physical activity interventions.

Major Compulsory Revisions:

1. The primary analysis uses linear regression models with continuous PAEE at follow-up as the outcome variable. Physical activity variables however tend to have a skewed distribution (with the majority of the population/sample doing no or very little activity) and based on the means and standard deviations of PAEE reported in Table 1 it seems that this is likely to be the case in this study. Was the distribution of the outcome variable checked for Normality? It is an assumption of linear regression models that the outcome variable is Normally distributed so if this is not the case then these models should not be used or an alternate/transformed outcome should be used. You could try log transformation of the PAEE at follow-up to see if this improves the distribution. Otherwise change variables (i.e. PAEE at follow-up minus PAEE at baseline) tend to
approximate a more Normal distribution, in which case the change in PAEE could
be used as the outcome instead of follow-up PAEE. If this is the case, baseline
PAEE should still be included as a covariate.

2. The manuscript reports on predictors of change in PAEE and conducts
separate models for each predictor variable. The authors report that male sex,
high alcohol intake and higher fitness levels were associated with significant
increases in PAEE. The authors acknowledge that high alcohol intake is likely
confounded by sex as men reported higher alcohol intakes than women at
baseline. This same issue of confounding for fitness levels however is not
acknowledged despite higher levels in fitness in men compared to women at
baseline. What would be more appropriate and useful to the physical activity
intervention research field, would be to identify independent predictors of change
in PAEE. That is a multivariate model adjusting for other predictors in the model.
Do the authors have a reason why independent predictors were not assessed? If
so, this justification should be included in the manuscript.

3. The evidence on predictors of physical activity change has shown mixed
results in terms of baseline physical activity levels. Some studies have found that
those with lower baseline PA are more likely to increase PA (due to greater
capacity to change) whereas other studies have found that those with higher
baseline PA are more likely to increase PA (due to greater/existing motivation). In
the models presented for this study, baseline PAEE explained a large proportion
of the variance in PAEE at follow-up. The regression coefficients for baseline
PAEE however are not presented. What was the direction of this association?
Why was baseline PAEE not reported or discussed as a significant predictor?
Self reported activity in the last year as assessed by the EPIC-Norfolk physical
activity questionnaire, was evaluated showing no association with follow-up
PAEE. Why do you think there were such differences between the self-reported
PA at baseline and baseline PAEE?

Minor Essential Revisions:

4. Paragraph 2 on page 8 reports on the changes over time for the clinical and
psychosocial predictors as well as PAEE. With the exception of changes in
PAEE, the results reported in this paragraph are not related to the aims of the
study and are distracting from the flow of the manuscript. The follow-up data in
Table 1 is also not necessary (follow-up PAEE for men is already reported in the
text but not for women).

5. Page 5 – CO2 should be VCO2

Discretionary Revisions:

6. The order of sentences in the beginning of the results is somewhat confusing.
The sentence ‘Participants with missing data at follow-up were similar…’ should
come after the first sentence reporting the number of participants with follow-up
data.
7. Table 2 reports the R2 for each predictor variable. My understanding from what is included in the text is that this is the proportion of variance explained by the whole model (i.e., including baseline PAEE), however the proportion of variance explained by the individual predictor variables is less than 1%. If this is not the case, please clarify in the manuscript and/or table. If this is the case, the inclusion of the R2 value in the table is confusing and could perhaps be omitted but with the sentence in the text referring to this remaining.

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

Quality of written English
--------------------------
- Acceptable

Statistical review
------------------
- Yes, and I have assessed the statistics in my report.

Declaration of competing interests
----------------------------------
I declare that I have no competing interests.

Marina Reeves PhD
Cancer Prevention Research Centre
School of Population Health
The University of Queensland, Australia