Reviewer’s report

Title: Protocol of a cluster randomized trial to investigate the impact of a diabetes risk prediction model on change in physical activity in primary care.

Version: 0 Date: 27 Nov 2017

Reviewer: Richard Bracken

Reviewer's report:

Overall, an interesting proposal for a study which aims to investigate whether the knowledge of an individual's diabetes risk scores changes the physical activity levels of that individual. The proposed study also wishes to examine the acceptance of a diabetes risk score from both the patient's and clinician's perspective. However, I do have a few comments particularly concerning the reliance on self-reported measures.

1) The study proposal does rely heavily on the use of self-report measurements and the primary objective is to investigate changes in physical levels as measured by the IPAQ. The authors comment that the study protocol is similar to that of Yates and colleagues (2009), however in their study changes in physical activity were measured using pedometers rather than self-report measures. There are a number of limitations with using self-report measures for monitoring changes in physical activity which are not acknowledged by the authors in this study. A more objective method could be to use pedometers for a week at baseline, 6 months and 12 months to monitor physical activity levels in a subset of individuals to complement the questionnaire findings. I would like to see either some acknowledgement of limitations using self-report or a consideration of using pedometers in the study design.

2) One of the study outcomes is to analyse changes in diabetes risk scores between the two groups. From the manuscript it does not appear that the control group will have their diabetes risk score measured at baseline which perhaps could be an oversight in the study design. Without establishing the diabetes risk score at baseline and comparing whether the groups are matched, it would not be possible to attribute whether any changes/improvements between groups were as a result of the intervention or just because they were unmatched at baseline (pages 8 and 26 (Table 1)). The calculation of risk scores at 6 and 12 months is again heavily reliant on self-reported measures; the limitation with regards to waist circumference has been considered. However, as with physical activity questionnaires, there are limitations in self-report measures when considering dietary habits too. I would like to see this acknowledged in the discussion sections.

3) There also appears to be little acknowledgement that risk scores are encouraged for use in Europe by diabetes charities and organisations (e.g. Diabetes UK and American Diabetes
Association) and accessible for the general public to calculate their individual risk score. The authors comment that guidelines recommend diabetes risk scores should be used in routine practice which makes the outcome about the feasibility of the risk score a little unclear.

4) The exclusion criteria for 'abnormal blood glucose' are diagnostic criteria for type 2 diabetes rather than impaired glucose tolerance. I suggest that the phrase in the methods abnormal blood glucose level is changed to an abnormal blood glucose level indicative of undiagnosed type 2 diabetes (p.6).

5) On page 8 when discussing the eleven questions in the GDRS only ten criteria are listed. I assume that weight/body mass is the missing variable from this list so that BMI can be calculated. If so, please amend the list and include weight/body mass.

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.

Yes

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I am able to assess the statistics

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