**Author’s response to reviews**

**Title:** Supervised exercise training and increased physical activity to reduce cardiovascular disease risk in women with polycystic ovary syndrome: study protocol for a randomized controlled feasibility trial

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Comments:
Thank you for allowing me to review this demanding protocol. Please could you help clarify the comments below:

1. The main issue with this study is how it is positioned. The primary outcomes are recruitment rate, attrition rate, compliance, reasons for drop-out and completions rates of the exercise programmes. This suggests that the study is therefore looking at the suitability of the exercise interventions in these women. However, the title is clear in stating the effect on oxidised LDL and cardometabolic profile in women with PCOS which are secondary outcomes. Supporting this, the introduction focuses on oxidised LDL, and the Discussion (Lines 390-1) states that the study, "aims to measure the feasibility of analysing oxidised LDL in PCOS, including whether concentrations can be reduced through structured exercise training." Firstly, oxidised LDL can be measured in PCOS - a study is not needed to determine the feasibility of this. Secondly, as stated in Lines 372-373, there is no formal sample size to determine whether oxidised LDL concentrations can be reduced through structured exercise training. Based on the primary outcomes, this study should be re-positioned as a mixed-methods study to examine the feasibility of structured versus lifestyle exercise interventions in women with PCOS. A mix of quantitative and qualitative barriers to exercise can be described. If the study aims to look at oxidised LDL then that needs to be the primary outcome measure and powered to do so.

Thank you for your comment. The authors agree that the aims of the proposed feasibility trial may not have been clear. The title, abstract (lines 63-72), introduction (118-124), and discussion (398-404) have all been refined to indicate that the aims of the current feasibility trial are to measure the acceptability of the interventions and procedures, and to obtain that information.
which is necessary to design an adequately powered RCT in the future, where oxidised LDL is the primary outcome.

2. A second issue is the LPAG. One aim is to reduce sedentary behaviour (Introduction and Line 394). Physical activity will be monitored and tracked using a smartphone fitness application but there is no measure of sedentary behaviour taken. Increasing physical activity does not necessarily reduce sedentary time and the two concepts are not synonymous. How is sitting time (the main marker of sedentary activity) assessed?

Thank you for this comment – we can see that we had missed out an outcome measure - The International Physical Activity Questionnaire (IPAQ) is administered at baseline and post-intervention, to all participants, and specifically asks about duration of time sent sitting during weekdays and the weekend. The secondary outcome measures section has been updated to provide more information on this (lines 313-320).

3. Please can you provide more details on how the intensity is determined for the EG participants? Line 228 states that exercise sessions should be 50-70% of maximum oxygen uptake (VO2max) but only a single stage Astrand test is being used to predict VO2max so workload cannot be set from this for walking or cycling. Lines 241-3 state that ACSM recommend individuals to work at 57-74% of maximum heart rate and that participants will progress to this 74% over 4 week increments. Please state how workload is initially determined and achieved and how it is controlled - it is unclear? Is predicted maximum heart rate used?

Thank you for pointing this out – we have now described the protocol for calculating estimated maximum heart rate, and how this was monitored and controlled throughout the sessions (lines 255-258).

4. Line 174: Please state how eligibility criteria (iii) is determined. Self-report or objectively measured? Is it only structured exercise, leisure-time physical activity, or total physical activity?

This is a self-reported measure. The authors feel that objectively measuring physical activity before enrolment in the trial would cause unnecessary undue burden on the participant, i.e. having to wear a pedometer or record activity using an app before they have even been randomised to the trial may be a potential drawback for participants, particularly if it turns out that they are not suitable for the trial. As mentioned in line 183, this is structured exercise only.

5. Line 175: Please confirm inclusion criteria (iv). Individuals must have been taking metformin for &gt;3 months to participate. So individuals not on metformin are ineligible?

This means that if a participant is taking metformin, they must have been already taking it for at least three months or they are not eligible. This has been clarified in line 184.
6. Line 180: Inclusion criteria (vii) - current CVD means clinically defined?

Yes – this has been clarified in the text.

7. Line 186: Please define where waist and hip measurements are taken.

This has been clarified in the outcome measures (323-326).

8. Line 251: Please state which smartphone fitness application.

Clarified in line 265-267.

9. Line 326: Please state how many individuals will be completed. This should be determined prospectively. Please can you submit a copy of the guiding interview questions (semi-structured) with the protocol.

This has been clarified in line 350. The interview guide has been attached. Thank you.