Author's response to reviews

Title: Developing a tool for obtaining maternal skinfold thickness measurements and assessing inter-observer variability among pregnant women who are overweight and obese.

Authors:

Lavern M Kannieappan (lavern.kannieappan@adelaide.edu.au)
Andrea R Deussen (andrea.deussen@adelaide.edu.au)
Rosalie M Grivell (rosalie.grivell@adelaide.edu.au)
Lisa Yelland (lisa.yelland@adelaide.edu.au)
Jodie M Dodd (jodie.dodd@adelaide.edu.au)

Version: 2 Date: 11 January 2013

Author's response to reviews: see over
Revisions to MS:1096219846774356

Associate Editor Comments:

1) “49 women …” Don’t start sentence with a number, use letters (page 3).

Response: This has been corrected in the paper.

2) All abbreviation need to given in full on first use, e.g. ICC as used in Abstract.

Response: This has been corrected in the paper.

3) Reading the reviewers’ comments I wonder whether the title could clearer. Reviewer Mottola seems to be confused by the term ‘protocol’ (as in research protocol), as the reported study is based on a prospective cohort study perhaps try: “A developing a tool for assessing maternal skinfold thickness measurements and inter-observer variability among pregnant women who are overweight and obese.”

Response: We have now changed the title of the paper to “Developing a tool for obtaining maternal skinfold thickness measurements and assessing inter-observer variability among pregnant women who are overweight and obese.”

4) Table 1 the term ‘race’ should this be ‘ethnicity’?”

Response: This has been corrected in the paper.
Reviewer #1 Comments:

Overall the manuscript is well written and clearly identifies the need for a protocol to assess maternal skinfold thickness measurements and inter-observer variability among pregnant women who are overweight and obese. This protocol is particularly useful for both future and on-going studies, as there is currently no standard for body composition measurement in overweight or obese pregnant women for assessing body composition. The limitations of existing methods are defined, such as those of BIA and BMI, and the manuscript describes the usefulness of the skinfold method in identifying maternal adiposity. The data is sound and statistical analysis appears appropriate and in line with previous studies assessing inter-measurement variability.

General comments on manuscript: All are Minor Essential Revisions (MER) or Discretionary Revisions (DR)

Abstract:
Abstract is well written and appropriate.

1) Abstract methods: Second line – missing ‘a’: were measured as part of ‘a’ prospective cohort study (MER).

Response: This has been corrected in the paper.

2) Fourth line- perhaps useful to define what a ‘set’ consists of i.e. 4 measures (DR)
**Response:** Each blinded observer performed 2 skinfold measurements on the biceps, triceps and subscapular. This has now been defined in the paper. (Please see Abstract Methods Section)

3) Abstract conclusion: Is ‘multiple observers’ perhaps misleading as there were only 2 observers for each measure?

**Response:** Two observers at a time performed the measurements on each woman but they were not always the same two observers, as we have now clarified in the paper (see inter-observer variability section). Therefore we consider multiple observers to be the most appropriate terminology.

4) Background: Line 2 – estimation of women entering pregnancy with a BMI greater than 25kg/m2 – It is not clear whether this is an Australian specific statistic or applicable to populations worldwide. References stated are Australia/New Zealand in origin, therefore perhaps the statistic should be clarified as such, or additional reference added which applies to populations outside of ANZ? (MER)

**Response:** This is an Australian specific statistic, which has now been clarified in the paper. (Please see Background paragraph 1)

5) The question proposed by authors is well defined, however the last sentence of the background is missing ‘the’: Therefore ‘the’ purpose (MER)

**Response:** This has been corrected in the paper.
6) Methods: First sentence ending ‘with 2 measures taken’: perhaps better clarified as ‘with measures repeated on 2 occasions’. (DR)

Response: This part of the sentence has been removed during the revision but is clarified later on in the methods. (Please see Methods, Inter-observer Variability)

7) Paragraph starting ‘measurement of bicep and tricep’ – should this be a continuation of the previous ‘bicep’ paragraph? (DR)

Response: Yes, this has been corrected in the paper.

8) Inter-observer variability section: Approximately how long was left between each of the observer measures e.g. minutes / hours / days? It would be useful to comment on this. (DR)

Response: The second observers performed measurements on the woman within minutes of the first measurer completing their measurements. They were done once the first landmarks were removed. This has now been stated in the paper. (Please see Methods, Inter-observer Variability, paragraph 1).

9) Discussion: Paragraph beginning ‘Nordhamn and colleagues’ - suggest including the reference for this in parenthesis. (DR)

Response: This has been corrected in the paper.
10) Conclusions are appropriate, however it could be acknowledged these was a homogenous population in terms of age and ethnicity. (DR)

Response: A paragraph has been added to the Discussion to address this point (Please see paragraph 1).

11) Discussion lacks any discussion of study limitations. These should be identified. (MER)

Response: This has now been addressed in the Discussion section. (Please see last paragraph)

12) Table 1: ‘BMI >=’. Suggest better using the symbol ‘#’ (MER)

Response: This has been corrected in the paper.

13) Table 2: SFTM to be written in full.

Response: This has been corrected in the paper.
Reviewer #2 Comments:

Although this is a nicely written paper, it is not clear what the protocol could be used for. Perhaps this may be better submitted as a techniques paper and not submitted as an original research article, since the research is not hypothesis driven.

Major Compulsory Revisions:

1) Although the authors suggest that lack of standard protocol exists for evaluating skinfold thickness measurements for obese pregnant women, it is not clear why they chose only upper body measures and also included arm circumference as part of this protocol. It would be more clinically relevant if the authors also included a connection/correlation of these measures to total body fatness, body mass, or BMI, perhaps, so that these measures would be justified. It is not clear how the findings however reliable, using multiple observers, would be used in a research setting – to determine what?

Response: The main purpose of this study was to determine a technique for assessing body composition in women participating in the LIMIT Trial, however it can be used more broadly in studies assessing body composition in similar populations. Upper body measurements were used to calculate body fat percentage. We have now clarified that skinfold measurements were of interest to enable body fat percentage to be calculated, and reported on inter-observer variability in body fat percentage in addition to skinfold thickness measurements. (Please see last paragraph of Background, BF% section in Methods, and Results, Table 2)
2) This paper is not hypothesis driven and may be better served if it was submitted as a technique paper?

**Response:** As noted by the Associate Editor, the term protocol in the title may have been misleading. We have therefore modified the title as suggested. Given that the article both describes a technique and assesses the reliability of that technique in a prospective cohort study, we chose to submit this as research article. However, if the editors feel it would be more appropriate as a technical article, we are happy for it to be published in this category.

3) On page 7, par. 2, the authors suggest that the purpose of the study was to “establish a standardized protocol for the assessment of skinfold thickness measurements and to evaluate the inter-observer variability in assessing body composition in this group of women.” It is not clear how the assessment of these upper body skinfolds will give rise to body composition assessment in obese women.

**Response:** We have now described how these measurements can be used to calculate percent body fat. (Please see Methods, BF %)

4) Methods: pg. 7, par. 4, line 1. The authors reported when the women were recruited but when were skinfolds done – at what gestational age? Were these done in one visit?

**Response:** All measurements were taken by both observers in a single visit at either trial entry ($10^{+0}$-$20^{+0}$ weeks’ gestation) or 36 weeks’ gestation. This has been clarified in the paper. (Please see Methods, Inter-observer Variability, paragraph 1)
5) How will skinfolds measured at one time, at one gestational age, predict body composition for the complete pregnancy without being related to weight gain? Or, how these measures change over time as pregnancy progresses in this population group? The authors cite the article by Lopez et al. 2011, that did assess changes in skinfolds and arm circumference but suggested that this paper did not give enough information regarding methodology. Perhaps conducting a study like this cited one with the improved technique over time in the overweight and obese pregnant population would be clinically relevant.

Response: The purpose of this study was to assess inter-observer variability to determine whether our approach for assessing body composition in overweight and obese pregnant women could be useful in the context of a clinical trial. We have since used this method in a larger sample of women in both early-mid and late pregnancy to assess changes over time as well as a tool to compare the control and intervention group in the LIMIT study. These findings will be reported in a separate paper.

The article cited (Lopez et al, 2010) used the same measurements as our study but was not comparable, as they did not describe the methods they used for determining intra and inter-observer variability. We have now clarified this in the discussion. (Please see discussion, paragraph 9)

6) Pg. 8, par. 3, line 2-3. How did the authors determine the lateral border of the head of the radius inferiorly? Did the authors mean the tip of the olecranon process – this is the usual landmark to determine midpoint of the arm for circumference.
Response: The landmark we used to determine the arm circumference was the head of the radius or Radiale (as referred to by International Standards for Anthropometric Assessment Manual 2006). We have now clarified this in the paper. (Please see Methods, Anthropometric Measurements, paragraph 2)

7) Pg. 12, par. 4; the authors are referred to the CME review article; McCarthy et al. 59(10):731; Obstet Gynecol Surv, in which methods of body composition were evaluated in relation to relevance to perinatal outcomes. On pg. 773, skinfold measurements overestimated subcutaneous fat in pregnancy. Although the current study assessed the inter-observer variability of specific skin fold measures, how does the skin fold technique compare to other maternal body composition techniques?

Response: Since we did not use other maternal body composition techniques in our study, we are unable to compare SFTM with an established method in order to draw comparisons for BF%. This has been added as a limitation of our study in the paper. (Please see discussion, last paragraph)

Minor Essential Revisions:

1) Abstract, line 4; end sentence at “analysis”. New sentence … “Not all of these…”

Response: This has been corrected in the paper.

2) Abstract, line 10; Type out “49” – “Forty-nine”

Response: This has been corrected in the paper.
3) pg. 7, line 6; add “the” in front of “purpose”

Response: *This has been corrected in the paper.*

4) pg. 13, line 5; add “,” after “0.67”

Response: *This has been corrected in the paper.*