Reviewer’s report

Title: The study of anthropometric estimates in the visceral fat of healthy individuals

Version: 2 Date: 27 January 2014

Reviewer: Bart G Koot

Reviewer’s report:

Major Compulsory Revisions

The question posed by the authors is relevant and well defined

Methodology and result section need major revision as described below

1- In this study stepwise linear regression is performed however several aspects of this analysis remain unclear and the analysis seems to contain two variables with probable collinearity:
   - It is not mentioned whether VFA-CT is normally distributed a prerequisite for performing linear regression. Moreover, residue analysis should be performed.
   - It is not explained how the six independent variables are selected for the multivariate analysis. It seems this is based on a highest standardized coefficient, but this is not clearly pointed out in the methodology section.
   - It is not explained in the methodology how multivariate selection is performed. Table 4 suggests variables are selected based on the r2 increase of the model. However, they are added subsequently (forward selection) but the variables that do not improve the model are not removed. This does is not a regular forward selection procedure.
   - Why did the authors not use backward selection? The sample size allows this
   - Line 263 collinearity is mentioned between Waist en WHR. Stating they are rarely used together in studies. In general it is considered methodologically incorrect to use two variables with collinearity in predictive regression models since they become unstable. Variance inflation factor (VIF) is used in this article however use of this rarely used parameter is not well explained. Why is collinearity not simply avoided?
   - Do show the results of collinearity testing between the 6 selected independent variables using a more usual measure for collinearity (Pearson correlation).
   - No analysis of effect modification between variables is performed. Sex is might be an effect modifier for several of the included independent variables
   - Sex has a low correlation however it is from a physiological viewpoint likely that the predictive formula is different for men and women. Analyses can be performed separately for sexes or test should be performed whether the model performs equal for both sexes or as mentioned effect modification should be tested particularly for sex
2- Revise the part from line 67-76: Explain which studies have found ‘reached different conclusions’ Explain why more variables ‘leads to more insight’ or leave this sentence out. Including more variables does not necessarily lead to collineairity. Collineairity should simply be tested between all included variables (see above). Leave out this sentence.

3- Table 1.
- Table contains many variables. Reduce the number (e.g. not both weight and BMI). Is it logical to include leg/chin/chest subcutaneous fat in this manuscript and analysis?
- Why are man and woman reported separately in this table? Statistically comparing between sexes is not relevant; compare the modeling to the validation cohort would be more informative.

4- Table 2
Clearly mention that univariate data are reported in this table
In both the text referring to this table as the table itself terminology is unclear. Although not a statistician in my view the following applies to linear regression analysis:

Univariate linear regression produces an unstandardized coefficient (referred to as B or ‘regression coefficient’) and standardized coefficient (referred to as Beta or ‘correlation coefficient’ or ‘r’). In this manuscript the term ‘coefficient’ is frequently used but it is not directly clear whether this refers to the ‘regression coefficient’ or ‘correlation coefficient’

Since Beta-values are used to select the variables for multivariate analyses it can be considered to leave out B-values.

The 95% CI and p-value of the Beta units of the independent variable should be given in order to be able to interpret these values.

In table 2 it is not clear whether the reported intercept and standard error probably relate to the beta or B-value. Moreover, consider reporting the 95% CI and p-value. In my view, these are more informative to the reader than intercept and standard error.

In all, the terminology/variables used in regression analyses and used methodology should be explained more clearly in the methodology section and text, including also the use of variance inflation factor.

5- Table 3 has no additional value and repeats largely data from table 2.

6- Table 4 What is the use of reporting the intercept?

7- Figure 1 and 2: The Bland Altman plot seems to suggest underestimation of the calculated visceral fat in those with higher volumes of visceral fat, although numbers are low. Discuss this.

7- The discussion section
Start by summing up the findings from this study in this section

The discussion section should not be used to explain the used methodology and provide further information on collinearity, parameter selection and perform a post hoc power analysis. This all belongs in the methodology and results section.

Minor Essential Revisions
- Revise the grammar and style e.g sentences in line 33 (consists?), 67 (associated?) 130 (lied?)
- Do not repeated data mentioned in the tables in the text
- Explain all abbreviations used in each table in the legend of that table
- Mention whether reproducibility of CT measurement was performed. Or explain why that was deemed unnecessary.
- Mention the number of observers and whether inter-/intraobserver variability of different measurements was performed?
- For Waist and Hip measurement mention whether measured wearing cloths, during gentle expiration?, repeated measurements?
- Mention ethnicity in the text.
- Mention the time interval between the different examinations performed in this study
- mention how allocation to derivation and validation cohort was performed

Discretionary Revisions

Quality of written English: Needs some language corrections before being published

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

Declaration of competing interests:

I declare that I have no competing interests