Author's response to reviews

Title: Development and tracking of central patterns of subcutaneous fat of rural South African children aged 5 to 15 years: Ellisras Longitudinal Study

Authors:

Kotsedi D Monyeki (dmonyeki@yahoo.com)
Han CG Kemper (berthankemper@zonnet.nl)
Phuti PJ Makgae (pjmakgae@yahoo.com)

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Reviewer # 1: Dr Vincent W Jaddoe

1. The reviewers assessed the development and tracking of fat pattern variables of children from preschool age into late adolescence from the Ellisras Longitudinal Study. This is a cohort study based on repeated height, weight and skinfold (triceps, biceps, subscapular, suprailiac) measurements. In total, 2225 children were enrolled at baseline and 1771 were still in the study after 8 years. The author found a significant tracking of subcutaneous fat variables (skinfold thickness, percentage body fat, fat mass and fat free mass) as children grew older while skinfold ratios showed low and insignificant tracking.

2. The data presented in the manuscript are unique and quality data analysis is very high. Results presented in this manuscripts are important from an etiological and developmental point of view. I have only some minor remarks which are important from the perspective of a more general epidemiologist/clinician.

• Thanks for the compliments about unique and quality data.

3. The written English is not always appropriate. I would advice the authors to contact a native English speaker or writer.

• Done

4. The paper is somewhat outbalance with relatively extended results section.

• The manuscript is now focused

5. Also the number of figures and tables is too much. Maybe it is better to split the paper into normal paper and additional web pages. This would improve the paper
The results section is made shorter

6. The tracking analysis is very important. The authors should perform similar analysis for body mass index (they have weight and height). Furthermore, is this tracking explain by BMI.

- BMI results for the Ellisras Longitudinal study were referred to in the manuscript. “In previous report, the current sample was reported to exhibits high prevalence of stunting and wasting particularly at an older age while thinness (preschool children ranged from 39.4 to 42.6% and primary school children ranged from 23.7 to 30.0%) was a major public health problem compared to overweight (pre school children ranged from 0 to 3.9% and primary school children ranged from 0 to 15.5%) [16, 17, 37].”

7. Why was no multiple imputation perform for the missing SFT. Does this changes the effect estimates?

- Done
  “To examine the effects caused by the subjects who were absent, we compared skinfold thickness with the paired follow up subjects during each period of measurement. There was no significant difference (p<0.05) between subjects of the same age who were currently in the study and the drop-outs. Thus, dropout at this stage seems to have been random. Interestingly, to examine the effect of overlapping ages for skinfold thickness of preschool and primary school children we found a significant (p<0.001) difference at a younger mean age (mean age 7.9 to 9.6 years) for boys while there was no distinct pattern of significant mean skinfold thickness difference for girls across the overlapping ages with the majority of overlapping ages showing no significant difference (Table 1).”

8. Level of Interest: An article of importance in its field

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

- Done

10. Statistical view: Yes and I have assessed the statistics in my report.

- Statistical analyses are done with advise of statisticians
Reviewer #2: Dr Renate Horejsi

1. The consequent monitoring and measuring body fat over eight years in nearly 2000 children results in a valuable data base, that should not be put aside. The data should be used and calculated by an expert statistician. The manuscript should be rewritten. The research question finding “tracks” indicating overweight in childhood should be the red line through the work. Draw few but imposing figures that show the significant difference in skinfold thickness between the groups.

- Thanks for the compliments about unique data. Other reviewers comments were attend to below.

2. The proposed points from the publishers are mostly not fulfilled. We read it as an accumulation of statements, no research question is asked and no answer is given

- The research question is clear and to the point. The answer is provided in the manuscript
  “The purpose of this study was to describe the development of two trunk skinfold and two extremities skinfold of rural South African preschool children (mean age of 4.9 years at base line to 11.5 years) and primary school children (mean age of 8.5 years at baseline to 14.9 years) over a period of eight years (Ellisras Longitudinal growth and Health Study (ELS)). Trunk-extremity skinfold ratios were constructed and their development were highlighted during the same period. In addition, the existence of tracking of skinfold and trunk-extremity skinfold ratios were investigated.”

3. This study has analogies with the “Amsterdam Growth and Health Study” and Prof Kemper is one of the author. We proposed that Prof Kemper as the corresponding author should rewrite the manuscript according to the international standards.

- We agree that this paper is comparable with Amsterdam Longitudinal Growth and Health Study from Netherland, though the current study was done in rural South African children. That is why Prof Han Kemper is co-author.

4. Not meaningful results should be omitted (Figure 2 and Tables?)

- The results section is made shorter
  “Figure 1: Development of median triceps skinfold of Ellisras rural children and NHANES III (Frisancho, 1990) reference population
  Figure 2: Development of median subscapular skinfold of Ellisras rural children and the NHANES III (Frisancho, 1990) reference population
  Figure 3: Development of median subscapular/triceps skinfold ratio of Ellisras rural children.

TABLES
Table 1: Differences in the mean fat patterns variables for overlapping mean ages for preschool (7.9 to 11.5 years) and primary school children (8.1 to 11.6 years) of Ellisras rural children
Table 2: Specific tracking coefficient (longitudinal tracking and partial correlation coefficient controlled for age and maturation) between the values at the first measurements and the subsequent measurements for fat pattern variables of Ellisras rural children.

Table 3: Regression coefficient, 95% confidence interval and \( P \)-value controlled for age and maturation in the association of the initial fat pattern variable measurements with subsequent measurements for Ellisras rural preschool and primary school children.”

5. It might be more interesting to oppose tracks of the overweight children to the lean and present these data in a figure.
   - The research question is clear and to the point. Answers were provided.

6. Ad1). The manuscript describes an extremely extensive and time consuming measuring of subcutaneous fat patterns in children for more than 8 years. The purpose of the study is not yet define.
   - Thanks for compliments for the collected data. The purpose of the study is clear and to the point (See 2 above)

7. Ad 2). The method of measuring subcutaneous body fat is not the best, but for such a long longitudinal field study other devices might be too expensive or not available. The chapter “Method” should be professionally condensed. Please do not write about the employment of the parents.
   - Geographical area and the demography of the Ellisras population have been omitted in the manuscript.

8. Ad 3). The presented data are not clear, the main results is not deducable. There are too many figures and tables without a clear statement. Draw one ore two figures with a clear distinction of the normal and overweight children. Make only two tables where significant different results are shown.
   - The results section is made shorter
   “Figure 1: Development of median triceps skinfold of Ellisras rural children and NHANES III (Frisancho, 1990) reference population
   Figure 2: Development of median subscapular skinfold of Ellisras rural children and the NHANES III (Frisancho, 1990) reference population
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Table 3: Regression coefficient, 95% confidence interval and $P$-value controlled for age and maturation in the association of the initial fat pattern variable measurements with subsequent measurements for Ellisras rural preschool and primary school children.”

9. Ad 4) to a certain extend the manuscript is an imitation of an article ‘ The Amsterdam Growth and Health Study”- F van Lenthe, HCG Kemper et al. – but big parts in the presented manuscript are written in an unclear and diffuse way.

- The manuscript is now focused

10. Ad 5). Discussion and conclusion section do not support the data even the introduction does not fit to the other chapter

- Discussion and conclusions are more focused

11. Ad 6).This study has evidently many limitation (the caliper and method measures a double skinfold, other simple parameters such as height and weight are not shown) but the limitation are not even mentioned

- Limitation for the study has been thoroughly worked out

“Selection of skinfold and skinfold ratios as indicators for the central pattern of body fat in children is of real concern given the challenges in measuring due to slightly larger inter and intra tester reproducibility of the skinfold measurements as it was also the case in the present study [41, 42, 43]. However, currently skinfolds are the most suitable indicators until such time when indicators can be found after the pathophysiological mechanism relating to central pattern of body fat to cardiovascular disease morbidity and mortality is clarified [2, 13]. Furthermore, the assessment of breast development was also problematic. Although we were able to obtain a visual assessment of breast development rather than relying on the self reports from girls, fat tissue can be mistaken for breast tissue in cases where the breast is not palpated. However, a key advantage of this method is that it is widely used by researchers and clinicians thereby increasing its applicability. Physical activity and fitness of these children were not controlled in the analysis. Finally, in our study girls were never asked if they had once given birth as some subjects missed measurements sessions more than one occasion and rejoined the study thereafter. Many adolescent girls, particularly in rural areas of South Africa today, have multiple pregnancies as a results of poverty and other social factors. It is common that initially women become overweight after their first birth child [44]. Very few, if none do engage in hard physical activity, sports or work after pregnancy hence they do not lose weight.”

12. Ad 7). The author have a broad reference list but some new articles published later than 2003 are missing
Current published manuscripts in the area were added.

13. Ad 8). The reader expects from title and abstract a distinct description of the changes of subcutaneous adipose tissue thickness during childhood in lean and overweight children. In the chapters “Results” and “Discussion” the “tracking” of subcutaneous fat variables is not clearly confirmed.

- Discussion and conclusions are more focused

14. Ad 9). The writing is not acceptable. Too much diffuse sentence without important information.

- English have been corrected.

15. We proposed that the data should be qualified by a statistician

- Statistics are also done in accordance with statistician (Prof Han Kemper)

16. The paper should be rewritten by an expert and submitted again

- Done