Reviewer's report

Title: Associations of BMI and waist circumference with energy intake and percentage energy from macronutrients: a cross sectional study in a cohort of Australian Children.

Version: 1 Date: 13 October 2010

Reviewer: Noel A Cameron

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General comments

1. This is an interesting paper on a theme that is of broad concern amongst those interested in the determinants of obesity and in developing intervention methods to curtail its global increase. Thus the topic deserves greater coverage than heretofore. The lack of a clear association between macronutrient intake and overweight/obesity in children makes intervention planning more difficult although the finding from this study of a clear, albeit small, significant relationship between energy intake and indicators of overweight/obesity, across three very different age groups, is welcome. The study is well thought out and robust in the sense that those not passing McCrory stringent criteria for plausible 24 hour dietary data were excluded. The fact that this amounted to 45% of those with complete data and only 37% of the initial sample is of some concern. The fact that so many participants were excluded calls into question the general validity of the 24 hour dietary assessment tool. It is a serious flaw that the authors fail to address external validity when faced with this level of exclusion.

2. I think that the conclusion is weak and not well thought out. Having found no association with macronutrient intake the authors’ major suggestion is that robust longitudinal studies need to be undertaken to elucidate the relationship linking obesity and dietary data. Why? The cross-sectional study they have undertaken, even for its flaws, is certainly robust. The results are clear and consistent across three age groups covering childhood and adolescence. What would a longitudinal study design contribute apart from rates of change of intake in addition to dramatically increased costs and a long delay in getting results? If the 24 hour dietary assessment tool was the same then no greater accuracy could be expected and the reduced sample necessary for a longitudinal design would mean that the McCrory criteria might decimate the sample. I would suggest that the authors need to either use or develop an appropriate (i.e. accurate and valid) dietary intake assessment method and undertake a repeat cross-sectional study that addresses the problems of the current study.

Major compulsory revisions

1. The Introduction is too long. Paragraphs 2 and 3 could be cut without affecting the content.

2. It is not clear how the authors arrive at deciding they wish to explore “possible
relationships of BMI and WC”. They do not, for instance, establish that the relationship between BMI, WC and body fat has been well established and that BMI and WC are important indicators of obesity and that, therefore, the relationship between BMI, WC and macronutrient intake is of some interest and importance. The final paragraph in the Discussion on page 14 should perhaps be in the Introduction to provide a basis for the study.

3. The McCrory approach appears to decimate the original sample excluding 45% of those with complete data thus only 37% (1352) of the original sample (3691) actually remain. The authors have not addressed the external validity of their sample in relation to either the remaining 1108 (2460-1352) with complete data or the original sample.

4. The authors have a tendency to repeat their introductory remarks in the Discussion paragraphs 1 and 2.

5. The author find associations but, as they clearly report, these are small, at less than 10% of explained variance, and thus the functional significance of these findings needs to be discussed. How, for instance, would they recommend that these results are used to develop sustainable intervention to prevent or reduce childhood obesity. Higher energy intake in those with higher BMI and higher WC should trigger some sort of response.

A statistical revamp is required for external validity

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Declaration of competing interests:**

I have no competing interests