

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Parental marital status and childhood overweight and obesity in Norway: A nationally representative cross-sectional study
<b>AUTHORS</b>	Biehl, Anna; Hovengen, Ragnhild; Grøholt, Else-Karin; Hjelmæsæth, Jøran; Strand, Bjorn; Meyer, Haakon

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Margo Barker University of Sheffield Uk
<b>REVIEW RETURNED</b>	27-Jan-2014

<b>GENERAL COMMENTS</b>	<p>This manuscript reported on a cross-sectional study, which examined associations between various measures of childhood adiposity and parental marital status in a nationally representative sample of Norwegian 8-year old children. The adiposity data were collected in the school setting and linked with census data on family structure. The analysis adjusted for maternal education, country of origin and area of residence (urban/rural). The study showed that there was a greater prevalence of overweight and obesity amongst children from families of divorced parents (28% overweight and obese) relative to children from families who had married parents (18.2% overweight and obese). Interestingly children from a third group of never married parents (comprising both single- and cohabiting-parent families) had very similar proportions of children classified as overweight and obese as those from married parents</p> <p>Whilst the study has been clearly described, seems to have been carefully carried out and has a laudatory aim, these data are difficult to interpret for several reasons:</p> <ol style="list-style-type: none"><li>1. The numbers of children in the divorced category group are small (n=230) and the 54% greater prevalence of obesity/overweight in this group must be interpreted very cautiously</li><li>2. The characterisation of the various family structure groups is problematic. Children in the divorced group will be heterogeneous in current family structure with various potential family groupings - single parent, shared parenting, and parent/stepparent combinations. Indeed the distinction between the never married group and divorced groups is hazy, for example, the never married group also contains single parent families who have separated after cohabitation. This crude classification system combined with the lack of detail on children's diet habits severely limits conclusions as to the impact of divorce and parental separation on risk of childhood adiposity. The discussion acknowledge the weakness of the classification system but nevertheless concludes that divorce is associated with adiposity</li><li>3. The discussion page 12 makes the point that children of</li></ol>
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	separated parents had less exposure to conflict than children of divorced parents. Such a strong statements needs to be backed by empirical evidence.
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<b>REVIEWER</b>	Dr Linda Byrne Senior Lecturer School of Psychology Deakin University Melbourne Australia
<b>REVIEW RETURNED</b>	28-Feb-2014

<b>GENERAL COMMENTS</b>	I think that this is an excellent paper that clearly addresses the authors goals. However, we (Byrne, Cook, Skouteris & Do, 2011) looked Parental status and childhood obesity in Australia (n = 8717 children) and found in contrast to this paper, girls of single-parent households had higher rates of overweight and obesity. Given our sample size and similar methodology, I would have expected to see these findings reported
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### VERSION 1 – AUTHOR RESPONSE

Reviewer 1 Comments:

Reviewer Name Margo Barker

Institution and Country University of Sheffield, UK

Please state any competing interests or state 'None declared': None declared

This manuscript reported on a cross-sectional study, which examined associations between various measures of childhood adiposity and parental marital status in a nationally representative sample of Norwegian 8-year old children. The adiposity data were collected in the school setting and linked with census data on family structure. The analysis adjusted for maternal education, country of origin and area of residence (urban/rural). The study showed that there was a greater prevalence of overweight and obesity amongst children from families of divorced parents (28% overweight and obese) relative to children from families who had married parents (18.2% overweight and obese). Interestingly children from a third group of never married parents (comprising both single- and cohabiting-parent families) had very similar proportions of children classified as overweight and obese as those from married parents

Whilst the study has been clearly described, seems to have been carefully carried out and has a laudatory aim, these data are difficult to interpret for several reasons:

1. The numbers of children in the divorced category group are small (n=230) and the 54% greater prevalence of obesity/overweight in this group must be interpreted very cautiously

REPLY: We agree that the divorced group is rather small, and we have added a comment in the conclusion section, page 12, line 26 (page and line; referring to the version submitted in November 2013). However, regression based statistical testing has been performed and the results are highly significant. Additionally, the associations were robust to adjustment for maternal education. The 95 % confidence intervals for the prevalence ratio for the divorced group were 1.21-1.95 for unadjusted analyses and 1.16-1.84 adjusted for maternal education.

2. The characterisation of the various family structure groups is problematic. Children in the divorced group will be heterogeneous in current family structure with various potential family groupings - single parent, shared parenting, and parent/stepparent combinations. Indeed the distinction between the never married group and divorced groups is hazy, for example, the never married group also contains single parent families who have separated after cohabitation. This crude classification system combined with the lack of detail on children's diet habits severely limits conclusions as to the impact

of divorce and parental separation on risk of childhood adiposity. The discussion acknowledge the weakness of the classification system but nevertheless concludes that divorce is associated with adiposity.

REPLY: We agree that the categorisation is crude, which is also discussed in the paper (page 10, line 16-23), and that the never-married category is challenging, mentioned in the discussion part (page 10, lines 19-22). However, we consider that the divorced group is clearly defined; the children in this group have experienced a divorce.

Although it implies weaknesses, connecting objectively measured anthropometric data with objective register-based data could also be considered as a strength. This issue is mentioned in the paper, page 11 lines 3-6.

The Norwegian Child Growth study did not collect data on diet habits or physical activity level; even though it is of crucial importance for childhood overweight and obesity. However, we did not request the children or the parents to fill out questionnaires. We are convinced that the exclusion of this contributed to the high participation rate (89 %), which was given priority in this surveillance study. We clearly see that this type of data would have added value to the study. On the other hand, our study did not focus on the explanations for observed differences between the categories.

Initially, we aimed to study all three groups – with equal focus - and the association with childhood overweight and obesity. However, as stated in page 11, line 19, the never-married group turned out to be heterogenic. Therefore, the main focus of the result presentation has to do with children of married parents vs. divorced parents.

We would like to emphasise that more precisely defined sub-groups of the never-married category should be further investigated in future studies, as cohabiting couples has four times higher risk of dissolution compared to married parents (stated on page 11, line 22).

3. The discussion page 12 makes the point that children of separated parents had less exposure to conflict than children of divorced parents. Such a strong statements needs to be backed by empirical evidence.

REPLY: We have omitted the section that is considering to what extent the children - of divorced and separated parents - have been exposed to conflict or not (page 12, line 14-20 - in the original document).

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Reviewer 2 Comments:

Reviewer Name Dr Linda Byrne

Institution and Country Senior Lecturer

School of Psychology, Deakin University Melbourne, Australia

Please state any competing interests or state 'None declared': none declared

I think that this is an excellent paper that clearly addresses the authors goals. However, we (Byrne, Cook, Skouteris & Do, 2011) looked Parental status and childhood obesity in Australia (n = 8717 children) and found in contrast to this paper, girls of single-parent households had higher rates of overweight and obesity. Given our sample size and similar methodology, I would have expected to see these findings reported.

REPLY: We have now included your study (1), on page 3, line 14 and 17, page 10, line 54 and 57 and on page 11, line 58.

We discussed conflicting results (i.e. different gender pattern) of another Australian study with similar finding as you described (page 10, line 53-57).

The background section should be more developed. There has been a lot of work done in this area and as presently written the background section does not reflect that adequately. There is a larger scientific conversation that this work needs to be placed into.

REPLY: We agree that the field and the scientific conversation regarding childhood obesity and family structure is growing fast and is already large. We have made changes in the introduction, (page 3, line 14). It was also made a correction on page 3, line 7-8, and reference number 3 is corrected (page

13, line 13).

Our interest concerns changes in the pattern of family structure the last decades. Contrary to many other studies, we have no data on diet and physical activity (as discussed above, bullet point 2), which is a limitation. We consider, however, that this study adds valuable information about potentially vulnerable groups at risk of developing adiposity. This work adds information to the scientific conversation in this field, also because of the quality of the data.

#### Reference List

1. Byrne LK, Cook KE, Skouteris H, Do M. Parental status and childhood obesity in Australia. *Int J Pediatr Obes.* 2011;6:415-8.