Reviewer's report

Title: An investigation of factors identified at birth in relation to anxiety and depression in old age. The Hordaland Health Study

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Reviewer: Ian Colman

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This study examined the association between early-life factors and symptoms of depression and anxiety in late adult life. The authors used data from a Norwegian population-based cross-sectional survey (the HUSK study) and linked 406 respondents aged 72-74 years to birth records at a local birth clinic. The authors found no associations between anthropometric measures at birth and depression or anxiety in late adult life. Depression and anxiety were associated with younger maternal age; anxiety was associated with small maternal pelvic size and poor maternal health; depression was associated with low paternal occupation.

Major compulsory revisions:

1. This is a well-written paper on an interesting topic. It is unfortunate that the authors were only able to link 406 of 3,341 elderly members of the HUSK study; however they show that those whose records were linkable did not differ dramatically from those who could not be traced back to birth. The small sample size (relative to other studies in this area) is a concern due to statistical power. The authors do a fine job of highlighting mechanisms that may explain why early-life factors may not be associated with late life mental health, such as changing social environments or stressors across the life course, however they neglect to mention the likely limited statistical power they had to detect small but meaningful effects. For example, the meta-analysis on low birth weight and depression that they cite found only a small magnitude of effect; such an effect may not be detectable with this sample. This must be addressed in the discussion.

Minor essential revisions:

1. Given the authors have access to gestational age, a more appropriate measure of fetal adversity is low birth weight corrected for gestational age. This adjusts the focus from pre-term birth to adverse conditions in the womb.

2. Some studies of birth weight and depression have reported a J-shaped relationship, whereby increased birth weight reduces the risk of depression up to a certain point, beyond which the risk increases. While there may be limited power to examine this, choosing a reference group that is of appropriate weight, instead of appropriate and very large combined, may change the results for LBW. Papers that discuss this include:


3. I found it odd that after the focus on birth weight in the introduction that there was no specific mention of birth weight or gestational age in the Results section.

4. The authors mention in the Conclusions that "there was no clear evidence of mediation". The authors have not specifically tested for mediation effects, only confounding effects.

5. The authors use the acronym FOAD for the foetal origins of adult disease hypothesis. The more widely term found in the field is the DOHAD hypothesis, which refers to the developmental origins of health and disease.

6. This may be splitting hairs, but this study doesn't appear to be a case-control study. It is a retrospective cohort study where all cohort members with available data are included.

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

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests