Reviewer’s report

Title: The educational gradient in cardiovascular risk factors: Impact of shared family factors in 228,346 Norwegian siblings

Version: 0 Date: 27 Jan 2016

Reviewer: Rosanne Freak-Poli

Reviewer’s report:

The relationship between family factors of siblings aged 40-45 year olds and CVD risk factors were assessed in 228,346 individuals. The fact that you have sibling groups with differing educational level between two or more siblings is a strength of your study. Another strength is the sex-stratified analyses. I believe that you could be clearer with your results / summary. I look forward to reading the revision.

MAJOR

From your abstract I was expecting that a range of family factors such as number of siblings, housing location (city vs country), etc were being assessed. Whereas you are assessing the similarities between siblings as a measure of family factors that impact upon CVD. Please consider changing the abstract, and elsewhere in manuscript: Instead of "As a more robust approach we investigated to what extent family factors shared by siblings impact on inequalities in CVD risk factors in adulthood using discordant sibling design." -> "As a more robust approach we investigated to what extent family factors shared by siblings share similarities impact on inequalities in CVD risk factors in adulthood using discordant sibling design." OR "we investigated to what extent being from the same family impacted upon CVD risk factors in adulthood using discordant sibling design." OR "we investigated to what extent family factors shared by siblings share similarities impact on inequalities in CVD risk factors in adulthood using discordant sibling design." In contrast, you explain it very well in the introduction, and it could definitely be clearer in the abstract.

I'm not sure how you should deal with risk factors that are within the SCORE. Eg. Accounting for age and smoking. Have you consulted a statistician?

MINOR

Location (country/city) missing from abstract

"known parental status" do you mean unreported? Or do the participants not know their parental details? Similarly "known length of education"
"Women had numerically stronger cohort and within sibships educational gradients for blood pressure, total cholesterol and BMI, and weaker gradients for the SCORE risk score (which is weighted for sex) (Supplementary materials S1 Tables A and B)." -> compared to? If you are comparing men to women, you would need to undertake another test and report the values and statistical significance.

How much cross over is there between 1980-1999 and 1990-2003 cohorts? Why is this analysis important? Maybe there was less education variability in the 1980-1999 cohort than the 1990-2003?

"In the sub-population of only sibships discordant for educational attainment the cohort estimates were slightly weaker than the cohort estimates in the study population (Supplementary materials, S3 Table vs. Table 3)." -> You would need to undertake another test and report the values and statistical significance for this specific test between the sub-population and the study population. I can't see where this has been undertaken.

Discussion - why "early life family factors"? are they not just "family factors"?

I am a little confused by your discussion summary, could you make your points clearer? There is no discussion of CVD risk?

Discussion out of order. Main results summary, discussion of main results in literature, strengths and weaknesses, conclusion

DISCRETIONARY

Please replace the word "inequalities" as can be confused with socio-economical inequalities?

"a larger proportion of the educational gradient in most of the CVD risk factors was explained by similarities between siblings in siblings born closer in time" -> Are you inferring that siblings born closer together have more similar education status or have more similar CVD risk factors? OR both - hence the education status is a key player in CVD risk?

TYPOS

Like -> this is colloquial English

"the educational gradient in height may"?

"with a with a model not using this approach"

"Our results did was not altered"

"The on average 30%"
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Unable to assess

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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I recommend additional statistical review

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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