Reviewer's report

Title: Influence of maternal and own genotype at tanning dependence-related SNPs on sun exposure in childhood

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Reviewer: Xin Li

Reviewer's report:

In the current study, the authors studied influence of maternal and own genotype at tanning dependence (TD)-related SNPs on sun exposure pattern in childhood. This is a relatively novel topic, considering the current knowledge on genetic variants that are associated with tanning dependency is still very limited. The study design and statistical analysis are straightforward, and the manuscript is well-prepared. However, I have several comments:

1. Selection of tanning dependency-related SNPs: The SNPs were selected based on two previous publications--ref 13 and 14. I understand that few papers have been published on TD-related SNPs, but I would suggest the authors to acknowledge the limitations of the selected SNPs in Discussion. For example, in Ref 14, the outcome of interest is ever used indoor tanning, which is not a good reflect of tanning dependency; Also noticed are the p-values of SNPs identified by those two papers, I would expect non-significant results after adjusting for multiple comparisons. Moreover, neither of them performed replication analysis to validate their findings.

2. Is data on mother's sun exposure behavior available? Looking at association between maternal SNPs and mother's behaviors, association between mother's and children's behaviors, and associations between maternal SNP and children's behaviors adjusting for mother's behavior (potential mediator) would make a more comprehensive analysis.

3. Could the authors also try other methods to correct multiple comparison? Would the reported genetic markers still be significant? Page 9, lines 41-46, they wrote "10 sun exposures were not included in the correction as they are not independent measures". Please show correlation matrix for the 10 variables.

4. The sun-exposure variables are self-reported, please discuss the validity of the data and how it may affect the estimations of association being studied. Children aged ~8 yrs old
usually spend most of their time at school, how accurate is the measurement of sun exposure if the information was solely from their moms.

5. Indoor tanning is more popular among females, and boys and girls may have very different sun exposure behavior patterns. Could the authors conduct stratified analysis by gender to detect potential effect modification? The same to pigmentation traits.

6. Page 6, line 21-26, the authors spent some words explaining the relationship between sun protective behaviors and TD. Mothers with TD protect their children and themselves less than mothers without TD. In Table 3 and Supplementary table 2, are the directions of association consistent with the hypothesis? It would be helpful if the authors could summarize the effect alleles and ORs for the association between selected SNPs with TD from the original publications (ref 13 and 14).

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

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

Unable to assess

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

Yes

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I am able to assess the statistics

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