Reviewer's report

Title: A population-based survey on tanning bed use in Germany

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Reviewer: Alan Geller

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This has the potential to be an important study but there are a number of mathematical errors and the authors are not presenting data similarly to the way that tanning bed data has been presented earlier.

Minor essential revisions

Comments

Abstract-results-should be clearer to say at least once in their lifetime

Major essential revisions

Background-I would not agree that the use of commercial tanning facilities has increased because of the belief that cosmetic tanning is safe. It is probably attributed to the strong desire to tan that is driving the usage and we do not know that all users really believe that they are safe.

Are there any legislative efforts in Germany to curtail tanning bed use? If so, or if not, these should be mentioned.

The most conclusive meta-analysis of tanning bed use has been done by IARC published in the International Journal of Cancer. This study should be included in the introduction.

Results-there is no discussion of the response rate to the survey.

Given that all other studies have shown much higher rates among young people, please provide rationale for surveying the entire population (turned out that this was a good idea)

There seems to be a number of concerns with the results and tables. In Table 1, the proportion of male users should be 22.8% or 166/727 rather than 47.8 and the rate of female use should be 33.6%. 260/774. The p value should be testing male vs. female usage. I would argue that for age and all other variables, we are interested in the rate per age group. For example, among the 426 persons ages 30-44, 43.2% are users and 56.8% are not users. These numbers should be fixed for all columns so that the row percentages total 100% The real rate for 14-17 year olds is 15/81 or 18.5% rather than 3.5%. All other tanning bed studies are showing the rate for each age group rather than the proportion of all users by age. This is very important so we have a way to compare across studies.
The authors have not done so but after this is fixed, they should also do the same analysis for age x gender.

Likewise, other studies have calculated the frequency of use differently and I would suggest that this be changed as well.

Figure 1 should show how many people there were in a particular age group and then calculate what percentage of them were frequent users.

The numbers should reflect the overall findings that show that 263/1501 people used tanning beds. Of these, 64% (169/263) used them at least 10 times. I do not know where the 40% comes from.

The interesting analysis is to look at each age group by gender and compare frequent use/any use since in nearly all other studies use is far greater among females.

Then there are results shown on page 8 that go into the number of minutes per session but this is never mentioned in the methods. Please make sure that all of the data from the results is explained first in the methods and all information from the methods is noted in the results.

It would also be useful to see if the predictors of any amount of use differ from the predictors of frequent use.

In the discussion, again, the data is not right. It cannot be that 17% used tanning beds less than 10 times and 11% used them more than 10 times if 169/263 users used them at least 10 times. It would be 169/1501 or 11% used them at least 10 times and and 6% (94/1501) used them less than 10 times. But I would again think that the analysis of frequent users uses just the people who use tanning beds for their denominator.

References 16 and 17 are mentioned in the first sentence of the discussion and then the authors use a different reference when they say For instance and refer to 18.

I would not compare this data to that taken from a magazine since their sample selection is likely very different.

The authors have used questions for predictors that have been used elsewhere and they do not explain much of the reasons for tanning bed use. The authors should use this opportunity to propose new questions and ideas that future researchers could consider when they develop their surveys.

**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'

Alan Geller