Author's response to reviews

Title: Migration background is a risk factor for caries in Austria school children, even when parents have received a higher education.

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Version: 3
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Author's response to reviews: see over
Dear Editors

Enclosed please find our revised version of the manuscript now entitled, “Migration background is a risk factor for caries in Austria school children, even when parents have received a higher education.” by the authors Barbara Cvikl, Gertraud Haubenberger-Praml, Petra Drabo, Reinhard Gruber, Andreas Moritz and Andrea Nell.

We revised the manuscript according to the reviewers’ comments. Changes in the manuscript were marked by underlining. Our response to comments of the reviewers is given in this letter. We also want to thank the reviewers for their constructive criticism.

Sincerely,

Reinhard Gruber

Reviewer Point by point answers

Reviewer's report
Title: Parents education level and caries status in children with an immigration background in Austria
Version: 2
Date: 30 October 2013
Reviewer: Lisa Christensen

Reviewer's report:
The present study is a cross sectional study performed 2007-2008 among 12 year old school children in Austria. The study aimed to investigate how immigration status and education level influence children’s caries status. The topic is of utmost interest; however, the present manuscript has some flaws and careless mistakes. This is a pity because the data material seems to be a valuable basis for research.

Major comments

1. The title of the manuscript does not clearly correspond to the aim of the study. There is a mix between the term oral health and caries status. The title must reflect the aim precisely.
   - We changed the title: Migration background is a risk factor for caries in Austria school children, even when parents have received a higher education.

2. Reading the background section, several studies show that the education level of parents is associated with the caries status of their children and also children’s immigration status influences their caries status. In the same section, another risk factor, namely type of school, is introduced as having influence on children’s caries status. Such variable is used in the present study but named “children’s (12 year-olds) education level”. In the methods section this is defined by two categories of schools with apparently different curricula? Does it mean that in general, 12 year-olds in Austria are clearly at different educational levels dependant on the type of school they attend?
Currently, there are indeed two different types of schools with different curricula for children between the ages of 10 to 14 years in Austria. One school type meets Level 2a according to the International Standard Classification of Education and prepares children to secondary education (high school). The second school type offers lower Secondary Education/Level 2C according to the International Standard Classification of Education and prepares children for working life, and ends after the official compulsory education (primary school). There are actually political motivations to change this and introduce a comprehensive school, but this would exceed the topic of this study.

Further, are there more than two types of schools for 12 year-olds in Austria? The term “type of school” should be used instead of education level, which seems confusing dealing with children.

- For 12 year-old children, these are the most frequently visited types of school. While there are a few special types of schools (for special needs or for the Montessori principle, e.g.), but these are negligible for this study.

- We changed the term educational level in type of school

Using such variable needs detailed explanation. Further, reference is made to ISCED system level 2 in connection with type of school. ISCED is a method for measuring educational level combining years in school and vocational training. How this is used here should be explained and a literature reference included.

- We tried to show the Austrian school system more clearly and make international comparisons with the ISCED system

3. 39 schools included in the study were randomly selected and distributed in relation to two types of schools. This selection process needs further explanation. Next step seems to be selection of the participating children and a matching process based on immigration status. How were the children selected? What was the participation rate after the selection? A diagram on the sampling and selection would be useful here.

- Schools all over Vienna were contacted, whereupon 117 agreed to participate. These cooperating schools were primarily divided regarding their location in Vienna (by district). Afterwards schools of two different types (Gymnasium - academic level high school/school type 1 and Hauptschule - elementary level high school/school type 2) were randomly selected from each district. Purpose of this procedure was to keep the socio-economic impact of the school area as small as possible. In each school 18 children were examined, whereby the children were matched according their migration background. If it was not possible to investigate the same number of children with migration background and without migration background because too few children in the school had a migration background, it was tried to compensate in the next school of the same district. The participation rate of children who were selected and agreed for the study was 100%.

- The sampling and selection of participants is now shown in a Figure.

4. From where did the authors obtain data on parents’ education, and was it father’s or mother’s education or both? Further, parents’ education level is not
defined in the method section? Such definition is needed.

- The highest level of education by a parent (mother or father) was recorded by means of a questionnaire by the parents. Regarding the parent’s educational level it was distinguished between low education level (no education or compulsory schooling) and high/medium education level (apprenticeship training, vocational school, high school or higher education).
- We give this information now in the M&M section

5. The clinical examination was made by one person and made according to WHO’s recommendations. WHO recommends control for intra-examiner variability to secure the validity and reliability of clinical data. No information was given on this

- Theoretical instruction units using clinical photographic slides were conducted to provide visual examples to the examiner on the use of the criteria and the examination method. In addition, a clinical training session was held. The entire time spent on the calibration process (theoretical discussions, training, and calibration exercises) was 2 days. Furthermore children of one school were examined under supervision before the study started.
- We give this information now in the M&M section

6. The Result section is somewhat confusing, since descriptions of table content and figures are mixed. Tables and figures should be described in the order they are presented.

- We changed Tables and Figures according your advice.

7. To give information on data in text only (not presented in tables and figures) is necessary, since not all data can be presented in tables and figures, but “not presented in tables or figures” has to be added in parenthesis to avoid confusing the reader.

- We added this information.

8. The term “oral health status” is often used in the manuscript. I find it necessary to be consistent in mentioning the specific indicators which are measured.

- We changed this and were more precise

9. At least two errors on reference to tables confuse the reader: “Additionally, tooth loss as a result of caries was observed 3.5 times more frequently in children with a migration background (Fig. 1)”. How is the M component illustrated in figure 1? “The SiC Index was not associated with the education level of the parents in either non-MB children (p=0.85) or MB children (p=0.26) (Table 1)”.

- The SIC index is not related to education level in table 1.
- We corrected this.

10. Table 1, 2 and 3 could easily be made as one table instead of three

- We removed Table 2 and 3 in its previous form, as we also have an additional statistical analysis regarding the correlations between migration background, type of school and education level of the parents on DMFT. We now have two tables corresponding to our Results section

11. Figure 1, 2 and 3 has no headings.

- We added the headings on the remaining figures
12. All boxplots lack explanation. Is the horizontal bold line the median and what is indicated by * and black dots?
   - We added the information about the horizontal line in the boxplots and removed the different degrees of outliers (* and black dots) to make the graphs more clearly.

13. The labels in figure 2 and 3 are apparently mixed up (when compared to the corresponding values in the tables), this took some time to discover since the explanatory text is insufficient.
   - Due to the advices in the review process, we have made an additional statistic analysis. Consequently the figures and tables have partially changed. On the new figures and tables we tried to incorporate your advices regarding headings, labels and distinctness.

14. The discussion section mentions a series of other factors that might be of interest to investigate regarding children’s caries status, but why did the study not include these factors? (Income level, how long the family had lived in Austria etc.?). It could at least be explained.
   - This was an initial study referring to the migration background. To keep the number of participating children as high as possible and thus to obtain meaningful information, the questionnaire for parents was reduced to the essentials. There was concern that we would not get an adequate number of participants if we send out a more detailed questionnaire with partially sensitive information. Now that the basic data are available, it is of great interest to investigate other factors like income level, how long the family had lived in Austria, etc. and their influence on children’s caries status.

15. The aim is not included in the abstract
   - We added the aim of the study to the abstract section.

Minor comments
1. As for the literature references, original references in relation to the methods used should be preferred. For example immigration status among the children was defined according to reference 35: Clark JY, Thompson IM: Military rank as a measure of socioeconomic status and survival from prostate cancer. Southern medical journal 1994, 87(11):1141-1144.
   - We corrected this and gave the correct reference: (UNECE) UNECfE: Recommendations for the 2010 censuses of population and housing. 2010.


   - We corrected this.
4. There are some sentences in the manuscript, which are difficult to grasp, but this might be due to language problems. In total, I would suggest the manuscript to be checked and corrected by a person with English language proficiency.

- The manuscript is now edited by native English-speaking experts of American Journal Experts

**Level of interest:** An article of importance in its field
**Quality of written English:** Not suitable for publication unless extensively edited
**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Reviewer's report**
**Title:** Parents education level and caries status in children with an immigration background in Austria
**Version:** 2  **Date:** 16 October 2013
**Reviewer:** Sigrid Van den Branden

**Reviewer's report:**
The paper describes the caries experience in twelve-year old children living in Austria and the associations with their immigration background, educational level of the parent, and type of school. Only univariate ANOVA’s were performed, and it seems to me that more elaborate analyses are necessary to confirm the findings and make correct interpretations. I have some remarks for the authors to consider:

**Major compulsory revisions**

**Abstract**
1. In the sentence on the methods, include information on the number of participant, age of the children, selection of participants, statistical techniques
   - We added this information to the abstract

2. Also include some p-values for the most important results
   - We added this information to the abstract

**Background**
3. It is not clear to me how ‘type of school’ can serve as a proxy for educational level of the child. Please provide some references to make this clear and explain the underlying mechanism.

**Methods**
- In Austria are two different main types of schools with different curricula for children between the ages of 10 to 14 years. Therefore different educational levels of children exist. One school type meets Level 2a according to the International Standard Classification of Education and prepares children to secondary education (high school). The second school type offers lower Secondary Education/Level 2C according to the International Standard Classification of Education and prepares children for direct access to the labor market. There are actually political motivations to change this and introduce a comprehensive school, but this would exceed the topic of this study.
  - For better understanding we now only use the term „type of school“ and omitted the term “educational level”

4. What is the response rate? 736 children out of how many invited?
5. It is not clear to me how the children were selected. I understand that you randomly selected 39 schools, but how were the children in the schools chosen? In the introduction, it is stated that 11.5% of the Austrian population has a foreign background. However, in your sample, 50% of the children has an immigrant background, so it seems to me this is no representative proportion for the society and a specific selection of children has taken place?

6. Please elaborate a bit on what the SiC Index stands for and how it should be interpreted.

7. The major shortcoming in this paper are the limited statistical analyses, which seem to elementary to derive any conclusions. Multivariate analyses are necessary to interpret the complex relationships between these factors. Educational level and immigration background should be inserted together in a multivariate model and the interaction between both factors should be taken into account. It would also be good to control for other related factors such as gender and age of the child.

8. It is not clear to me how the data can be normally distributed. In the results section it is stated that 29.8 and 40.5% of the children were caries-free, so it seems impossible to have normally distributed data. A model should be used which takes into account the excess of children with zero results.

9. A kruskal-wallis test can indeed be used if data are not normally distributed, but is mostly applied to non-parametric data, which is not the case for DMFT or DMFS data.

Discussion
10. It should be tested whether the conclusions can be confirmed with multivariate analyses.
Due to the additional statistical analysis on your advice, we adapted our manuscript. Broadly, our statement was confirmed, however, there was an important information gain regarding the level of education of the parents and the caries status of their children. We adapted our conclusion correspondingly.

Discretionary revisions

Abstract
11. First sentence: ‘Education and immigration background are risk factors’…
Please be more specific about ‘education’, do you mean educational level, of the parents, of the child, is a high or low educational level a risk factor, …?
   - We added this information in the abstract

Background
12. Line 2: What do you mean by ‘educational work’? Health education?
   - We changed the term “educational work” in “oral health education”

13. Line 3: The sentence starting with ‘it is mainly the industrialized…’ does not read well, please rephrase
   - We changed the sentence: In particular, the industrialized Western countries reach the European Goals for Oral Health of the WHO for 2020, that children at the age of twelve should have no more than an average of 1.5 DMFT (decayed, missing, filled teeth).

14. In the international literature, the relationship between the socio-economic status of a person and his or her oral health status is well described. Educational level is generally considered a measure of the socio-economic status of a person. In the WHO report on social determinants of health (Solar & Irwin, 2010) the rationale for this is described as well as the underlying theories of how educational level (of the parents) can have an impact on one’s (oral) health. It could be interesting to include this in your paper.
   - We added some interesting information from the WHO report on social determinants of health in our Discussion section

15. Page 3, last paragraph, sentence on ‘the question arises…’: What do you mean by ‘independent or dependent risk factors’? Isn’t it more the question of how both risk factors are interrelated or not and have an impact on each other or not?
   - We changed the paragraph and described the objective: The objective of this study was to evaluate the influence of immigration background on the DMFT, considering the education level of the parents and the school type of their children.

16. The authors mention correctly that the health care system is a related factor in the development and treatment of dental caries. It would be interesting to apply an ecological model to describe the related risk factors to caries in children, for example Fisher-Owens et al, 2007.
   - We added some interesting information from Fisher-Owens et al, 2007 to the Discussion section

Results
17. First paragraph: Please avoid repeating data in the text and tables.
   - We omitted the detailed data in the text
18. I would suggest moving the sentence ‘A DMFT score less than 3 already …’ to the discussion section.
   - We removed this information from the M&M section

19. Rephrase the sentence ‘these results are also supported by / observed when using? the DMFS index.
   - We rewrote the paragraphs Impact of education level of parents on children’s caries status and Impact of the type of school attended by the children on their caries status due to the new statistical analysis.

20. DMFS results are not shown in Table 3
   - We removed Table 3 due to the new statistical analysis

References

Level of interest: An article of importance in its field
Quality of written English: Needs some language corrections before being published
Statistical review: Yes, and I have assessed the statistics in my report.
Declaration of competing interests: I declare that I have no competing interest