**Author’s response to reviews**

**Title:** Sleep quality in cigarette smokers and nonsmokers: findings from the general population in central China

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Sleep quality in cigarette smokers and nonsmokers: findings from the general population in central China

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BMC Public Health
Dear Dr. Chizimuzo Okoli

We would like to thank you for the opportunity to revise our manuscript, and thank the reviewers for their thoughtful comments and efforts towards improving our manuscript. In the following, we have addressed the points raised by the reviewers, as detailed in blue text, below.

Reviewer reports:

Fengsu Hou (Reviewer 1): This is a large scale cross-sectional study in central China, which focuses on the association between smoking or cigarette smoking and sleep quality. The study reports smokers had poorer sleeping quality, and found, among smokers, several factors associated with sleep disturbances positively or negatively.

I have several comments for the manuscript and I am very looking forward to having responses from the authors.

1. The introduction presented cigarette consumption in China, its adverse health outcome, nicotine and related health issues, the associations between smoking and sleep quality, etc. However, it missed presenting the prevalence of poor sleep quality among smokers in China (laking, yes, but it does not mean none).

Response: Thank you for your suggestion! We revised and added the following information in Introduction section: “However, only a few of studies examined the prevalence of poor sleep quality or sleep disturbances among Chinese smokers and nonsmokers. A survey of 3285 Changchun city general population showed that poor sleep quality was associated with cigarette smoking [32] However, a cross-sectional survey of 3289 middle-aged and elderly Chinese did not find significant association between sleep quality and smoking habit [33].”

2. Page 6 line 50 to page 7 line 28: In this section, the authors described the sampling and participants.

1) However, if this study was not a part of larger study, then how did the sample size be determined? Further, during the sample size calculation, as a cross-sectional study, did the author use the prevalence of sleep disturbance among the general population or the prevalence among smokers?
Response: This manuscript is the second analysis of the community-based sleep survey data with a large sample size. We used the prevalence of sleep disturbance among the general population. We originally mainly focused on sleep quality and sleep problems. As the first author’s recent work mainly on smoking cessation, and found that smokers frequently reported poor sleep quality. Then, we were interested in analyzing the relationship between smoking and sleep quality within this data.

2) What was the inclusion or exclusion criteria? Was the survey only focused on local residents based on the "Hukou" system? Would immigrant workers be included?

Response: We added the following information in the Method section:

“Inclusion Criteria: · Aged 12 years or older · Both gender · Living in their current residence for 5 years or longer · Be able to recognize 1,500–2,000 Chinese characters (fully recognize the Instructions) · Willingness to participant the survey Exclusion Criteria: · Less than 12 years old · Fail to provide oral informed consent or unwilling to participant”

The survey only focused on local residents based not on "Hukou" system but on how many years they lived there. It is stated in the Method section as “living in their current residence for 5 years or longer”

3) The sample size was 27,300, and 26,851 participants completed the survey, and 26,282 records were applied in analysis. But in results, the authors mentioned "a total of 26,851 subjects were sampled from the general population and 26,282 (97.9% response rate) completed the self-report ....". Being sampled does not mean completing the survey. And response rate should be calculated by how many participants you have reached out to and the sample size. The number 97.7% only means the percentage of data can be used for analysis after data clean. And if completing self-report cigarette smoking characteristics was one of the inclusion criteria, then should state.

Response: We revised the Method section as: “A total of 27,300 subjects were sampled from the general population and 26,282 completed the self-report of cigarette smoking characteristics.” “with completing self-report cigarette smoking characteristics as one of the inclusion criteria. Thus, after the exclusion of missing demographic and smoking information, 26,282 participants were available for the final analysis.” and the Results section as: “A total of 27,300 subjects were sampled from the general population and 26,282 (97.3% response rate) completed the self-report of cigarette smoking characteristics.”
4) The age range should be in results.
Response: We added the age range in Table 1.

3. Page 8 line 1: The definition of illiterature is not practical in real survey. Will interviewer count how many words any participant can read?
Response: We did not provide participant to count words, but we recommended all participants to read the Instruction and make sure that they fully understood the Instruction. If a participant was unable to recognize the Instructions, he or she would not be able to recognize 1,500–2,000 Chinese characters. Thus, we defined illiterate as those who were unable to recognize 1,500–2,000 Chinese characters. We added the information in the Method section: “Those who were unable to recognize 1,500–2,000 Chinese characters (cannot fully recognize the Instructions) were defined as illiterate.”

4. Page 8 line 23 to line 31: Has the Visual Analogue Scale for Craving been validated in China before? Does it have a Chinese version? If not, who did the translation. The author should state the cronbach alphas for VASc and PSQI.
Response: The single-item visual analogue scale (VAS) was used in many studies with Chinese participants. For example, VAS was evaluated in Chinese patients to assess the degree of pain. We added a reference:


5. Page 9 line 1 to line 6: The authors should list the statistic significant level here, p value.
Response: We added the information in the Method section as: “The significance level was set at p-value threshold of 0.05.”

6. Page 9 line 56: Table 1 first appeared here.

Response: As some tables larger than one Letter page, we moved all tables to the end of the manuscript according to the journal’s Submission Guidelines. “Tables larger than one A4 or Letter page in length can be placed at the end of the document text file.”

1) The p values in Table 1 is confusing. For example, in the age section, the p value was under 0.001, did the value indicate the differences in mean between smokers and non-smokers or the differences of the distribution of participants in each age group between smokers and non-smokers? Under the table, the authors mentioned ”%” presented for the percentage of subjects, if the distribution of participants in each age group and any other subgroup was not the main topic, I suggest to list the prevalence of sleep disturbance for each subgroup here.

Response: Yes, the p value indicates the differences between smokers and non-smokers. We revised it as: “Significant difference between groups of non-smokers and smokers, p<0.01”

We also added the information to explain the percentage: “% The distribution of participants in each group or subgroup.”

As Table 1 only listed the demographic and smoking characteristics, we added the prevalence of sleep disturbance for different levels of education, marital status and regions in Table 3. Percentage of sleep disturbances (poor sleepers) in different age stages among overall participants, non-smokers, and cigarette smokers”. It revised as: “Table 3. Percentage of sleep disturbances (poor sleepers) in different age stages, levels of education, marital status and regions among overall participants, non-smokers, and cigarette smokers”

2) The definition of cigarette smoker, alcohol drinking, BMI, analysis methods, the calculation of VASc score should all be listed in methods not under table 1.

Response: Thank you for your suggestion! We added them to the Methods section.

7. Page 10 line 3 to line 23: Table 2 and table 3 has the same problems as table 1.

Response: we revised all table as: “Significant difference between groups of non-smokers and smokers, p<0.01”
8. Page 10 line 28 to line 48: In the regression analysis, how did author treat factors age, gender, employment, marriage and residence, as continuous or categorical factors?

Response: We treat age and BMI as categorical factors and others as categorical factors. We added this information in the Analysis part of Methods section.

9. Page 13 line 9: Why the low rate of female smokers was one of the limitation?

Response: There is a gender difference in sleep quality in general population. However, we did not examine the gender difference of sleep quality in cigarette smokers because of the low rate of female smokers.

10. The authors should state about what future studies should do bassed on current findings.

Response: We revised the Discussion section and Conclusions section accordingly.

Guoqing Hu, Ph.D. (Reviewer 2): This study was based on a large-sample survey and collected a lot data. But a few critical issues were not clarified.

1. The research question is unclear for this paper. The justification of this study is weak. What is the scientific significance of studying the relationship between sleeping quality and cigarette use? References are needed for key sentences (rows 25-28 on page 5 and rows 1-4 on page 6).

Response: Thank you for your suggestions! We revised and added references for the following information in Introduction section: “Yet, it may also contribute indirectly to health problems (such as physical or mental distress) through impairing sleep among smokers [4, 5].”

References:


“Besides smoking’s potential impact on sleep quality, there has also been some research suggesting that sleep quality may affect smoking behaviors [16, 20].”

References:


2. It is unclear why this study targeted persons aged 12 years and older. Please clarify it.

Response: This study was mainly to investigate sleep quality among Chinese adolescents and adults, so we also included adolescents aged 12–17 years.

3. Please provide a reference to the operational definition of cigarette smoking (rows 14-17 on page 8).

Response: The definition of cigarettes smoking status referred to a meta-analysis: “Table A1 Definition of the e-cigarettes and cigarettes smoking status in studies included in the meta-analysis.”

We added the following reference:


4. Statistical models should consider sample weight since the study subjects were selected using complex sampling schemes.

Response: The reviewer asked about sample size calculation. As we addressed before, this manuscript is the second analysis of the community-based sleep survey data with a large sample size. This random sample may be more convenient but may not appropriately represent the population if we take some factors such as class, gender, education etc. into consideration. However, the sample size is much larger than the weighted sample. Take gender for example (see below, according to Data of 2012 population census in Hunan province), the total population is 67536496 (male 33768248 vs Female 31915247), and the likelihood of being selected is 0.0004. Then, the sample weight for female was only 2420 and for male population was 2596. Thus, we did not weight this sample.
5. Table 4 is hard to read. If possible, please focus on the key research objectives, or separate it into two tables.

Response: We moved the results of “age, gender, BMI, employment status, marital status, and rural or urban residence” and only focus on the key research objectives of “cigarettes per day, years of smoking, number of quit attempts, and smoking cravings” in Table 4.

6. The discussion needs to be much improved. In particularly, the new findings and their implications for policy and future studies should be detailed.

Response: We revised the Discussion section and Conclusions section accordingly.

Thank you for your consideration of this work!

Sincerely,

Dr. Jinsong Tang