

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Prevalence and associated factors of smoking in middle and high school students: a school-based cross-sectional study in Zhejiang Province, China
<b>AUTHORS</b>	Wang, Meng; Zhong, Jie-Ming; Fang, Le; Wang, Hao

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Xinguang Chen University of Florida
<b>REVIEW RETURNED</b>	13-Nov-2015

<b>GENERAL COMMENTS</b>	<p>This is a very important study with large random sample, it provides current data on tobacco use among adolescents in a advanced coastal province. The research design is good, the statistical analysis is okay in general. The results look reasonable. However, the following issues must be addressed before the data can be published.</p> <ol style="list-style-type: none"> <li>1. Weights must be used to estimate the prevalence rates, considering the proportion of the three types of students in the province. Smoking rate is often substantially higher among vocational high school students but this type of students only comprise a small proportion of the total student body.</li> <li>2. Need to extend both the Introduction and Discussion with more description about those new and modifiable influential factors, such as if living with family, parental divorce and separation that are becoming more and more common along with the industrialization, economic grow, and social changes.</li> <li>3. Need to discuss why the prevalence of smoking from this study is higher than those of the 2014 GYTS?. This study contains a half of students from vocational high school with very high rates. With reference to question 1 and potential issues with 2014 NYTS.</li> <li>4. Need to address the geographic differences in adolescent smoking while summarizing the findings of this study.</li> <li>5. Improve English usage and grammar. The paper reads smooth, it is always good to improve language even for a native English speaker!</li> </ol>
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<b>REVIEWER</b>	Tushar Singh Centers for Disease Control and Prevention, Atlanta, Georgia, USA
<b>REVIEW RETURNED</b>	25-Nov-2015

<b>GENERAL COMMENTS</b>	<p>The article provides important findings on prevalence and factors associated with current smoking in middle and high school students in Zhejiang Province in China. I have the following comments:</p> <ul style="list-style-type: none"> <li>• Authors should state clearly in the title and abstract that the sample is from Zhejiang Province.</li> </ul>
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	<ul style="list-style-type: none"> <li>• As only current smoking was analyzed, authors should state this clearly throughout.</li> <li>• In strengths and limitations, authors should clarify and explain that the results cannot be generalizable to Chinese population.</li> <li>• There are several typos/ spelling errors and grammatical mistakes. Overall language and punctuation also needs considerable improvement throughout.</li> <li>• Authors should describe the gap in the literature more clearly. Additionally, the meaning of “smoking behavior” (page 4, lines 14-16) is not clear. As this is a cross sectional study, please use “factors associated” instead of “predictors” (page 4, line 16) consistently.</li> <li>• Authors should cite research on Chinese populations to reflect previous work on factors related to smoking among adolescents. References 7 and 8 are not appropriate to convey this accurately.</li> <li>• Methods are very verbose, and still do not provide enough information about the selection criteria. For example, what were “eligible cases”? Authors mention that students were recruited to investigate smoking prevalence and factors, however, later in the methods, the overall study recruitment objectives are different. The meaning of “...on the basis of socioeconomic status” is not clear. Similarly, “...based on number of students” is not clear.</li> <li>• I am not sure of the utility of using secondhand smoke exposure as a risk factor for smoking, particularly in a cross sectional study. Could the authors please explain and cite previous research? I also think it would be highly correlated with parents’ smoking status. Did the authors explore this before adding it to the multivariate model?</li> <li>• Please add the comparison or referent group throughout the results (in the abstract as well).</li> <li>• Please be consistent with the terminology throughout to refer to factors associated with smoking. As this is a cross sectional study, please do not use increasing or decreasing/reduced risk.</li> <li>• For multilevel variables, it is not clear if significance testing was conducted to assess difference between each level. If not, please refrain from stating these differences (e.g. for age, increasing risk with age is mentioned).</li> <li>• The first paragraph in discussion needs better connection with data and authors’ reasoning.</li> <li>• In discussion, it is not clear why authors chose Florida study, instead of a national study for comparison. Similarly, authors have mentioned that their results were similar to the 1998 study in the same province, which seems incorrect, as the prevalence in that study was 0.3%.</li> <li>• Please refrain from usage of “increased risk” and “reduction of risk” in the discussion.</li> <li>• On page 10, lines 54-56, authors mention results from another</li> </ul>
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	<p>study, but do not correlate it well with their own.</p> <ul style="list-style-type: none"> <li>• Limitations section is missing from the discussion.</li> <li>• It would be useful to have clear recommendation and public health actions related to the results of this article. Authors found several demographic and socioeconomic factors associated with current smoking, however, it is difficult to take action on most of them. This would tie in with the relevance of such research.</li> <li>• Please improve the titles of the tables.</li> <li>• In the abstract, use of the term “relevant data” in the primary and secondary outcome measures is very vague.</li> </ul>
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## VERSION 1 – AUTHOR RESPONSE

### #Reviewer 1

1. Weights must be used to estimate the prevalence rates, considering the proportion of the three types of students in the province. Smoking rate is often substantially higher among vocational high school students but this type of students only comprise a small proportion of the total student body  
Response: We all appreciate your valuable suggestions. As you pointed out, our study participants consist of three types of students, middle school students, academic high school students and vocational high school students. As the results showed, the current and ever smoking prevalence among the three types of students are various and substantially higher among vocational high school students. Consequently, weights must be used to estimate the relevant rate. However, for our study, in the process of sampling, we used Probability Proportionate to Size Sampling (PPS) method based on the total number of students in each type of school (middle school, academic and vocational high school). With the PPS method, the certain proportions of students selected in three types of school have been calculated to represent the relatively appropriate proportion of the three types of students among the adolescent population. Although the number of vocational high school students is relatively small, we believe the selected samples of students are good representation of total adolescent population and our reports on the estimated ever and current smoking prevalence of total adolescent population are relatively appropriate.

2. Need to extend both the Introduction and Discussion with more description about those new and modifiable influential factors, such as if living with family, parental divorce and separation that are becoming more and more common along with the industrialization, economic grow, and social changes.

Response: Thanks for your kind advice. Indeed, family factors play an important role in adolescent psychology health, which has been reported to be associated with the smoking behavior. With the industrialization and socioeconomic changes, more emphasis should be on the family related factors, such as family structure. Under your careful instructions and request, we have added the related statements to the corresponding introduction and discussion sections. Please see them in the revised paper.

3. Need to discuss why the prevalence of smoking from this study is higher than those of the 2014 GYTS? This study contains a half of students from vocational high school with very high rates. With reference to question 1 and potential issues with 2014 NYTS.

Response: Thanks for your good questions. In our study, the overall prevalence of current smokers is 7.93 % (including 13.44 % of boys and 2.46 % of girls). According to the newly released data from 2014 Global Youth Tobacco Survey (GYTS), 5.9 % of students (9.9 % of boys and 1.6 % of girls) aged 13 to 15 years are current cigarette smokers in China, which are all lower than our results. As we declared in the discussion, the prevalence difference between the two studies may be due to the different samples and we want to make the specific explanations from the following aspects. Firstly, for our study, we selected three types of students (middle school, academic and vocational high

school) and high school students (51%) consist of more than half of the total samples. For 2014 GYTS, we find that only middle school students in grade 1 to grade 3 participate in the survey (World Health Organization. China Global Youth Tobacco Survey 2014 Available from [http://www.wpro.who.int/china/gyts\\_china\\_fs\\_en\\_20140528.pdf?ua=1&ua=1](http://www.wpro.who.int/china/gyts_china_fs_en_20140528.pdf?ua=1&ua=1) June 16, 2015). As previous studies and our results showed, high school, especially vocational high school students have a higher smoking rate than middle school students. Secondly, for the students selected in our study, the mean age is 15.35± 1.84 years old. For 2014 GYTS, the age of students in the survey are 13-15 years, which are much younger than that of our study participants. Furthermore, as reported by previous studies, the older age is also associated with higher smoking rate.

4. Need to address the geographic differences in adolescent smoking while summarizing the findings of this study.

Response: Thanks for your kind advice. In the process of statistical analysis, our results show that there is no significant geographic difference in adolescent smoking in the univariate logistic regression analysis ( $P>0.1$ ), which will not have an influence on our final analysis of the smoking factors. Besides, based on our first round study in 2007, geographic positions are not as an associated factor of adolescent current smoking in Zhejiang Province and rarely reported by previous studies indeed, so we decide not to show the relevant data of geographic positions and make any comments in the current and future studies.

5. Improve English usage and grammar. The paper reads smooth, it is always good to improve language even for a native English speaker!

Response: The advice you proposed is very important. Not as an English native speaker, our English language in the original paper is not so well. Consequently, we have tried our best to invite a professor, which is an English native speaker to help us edit our language carefully. We sincerely hope it will be better and satisfy you. Please read our paper again and we all appreciate your precious further comments.

#Reviewer 2

1. Authors should state clearly in the title and abstract that the sample is from Zhejiang Province

Response: We agree to your constructive suggestions. We have added the corresponding statement in the title and abstract to clearly show that the sample is from Zhejiang Province. Please see our modifications of title and abstract in the revised paper.

2. As only current smoking was analyzed, authors should state this clearly throughout

Response: We all appreciate your valuable comments. As your careful instructions and request, we have added the clear statement that the associated factors analyses in our study are conducted only among current smokers. We have revised our statements in abstract, methods, results, and discussion section, respectively. Please see them in the revised paper.

3. In strengths and limitations, authors should clarify and explain that the results cannot be generalizable to Chinese population

Response: Thanks for your kind reminder. Indeed, as our samples were selected in Zhejiang Province, which is one province of China, the representativeness of our results is not so well for total Chinese population and should be stated in the limitations. Under your instructions, we have added the statements in the strengths and limitations section in the revised paper. We hope the statements are appropriate and we all appreciate your further precious comments.

4. There are several typos/ spelling errors and grammatical mistakes. Overall language and punctuation also needs considerable improvement throughout.

Response: Thanks for your precious comments. As you pointed out, there are several spelling errors and grammatical mistakes in our paper and the language needs improvement. Indeed, not as an English native speaker, our English language in the original paper is not so well. Consequently, we have tried our best to invite a professor, which is an English native speaker to help us edit our language carefully. We sincerely hope it will be better and satisfy you. Please read our paper again and we all appreciate your precious further comments.

5. Authors should describe the gap in the literature more clearly. Additionally, the meaning of "smoking behavior" (page 4, lines 14-16) is not clear. As this is a cross sectional study, please use

“factors associated” instead of “predictors” (page 4, line 16) consistently.

Response: The advice you proposed is very important. The meaning of “smoking behavior” is not clear indeed and we have made corresponding modifications. Besides, as our study is a cross sectional study, the word of “predictors” is inappropriate to show our findings and we have revised according to your instructions. Please see our revised paper and we will appreciate it if you have further comments.

6. Authors should cite research on Chinese populations to reflect previous work on factors related to smoking among adolescents. References 7 and 8 are not appropriate to convey this accurately.

Response: Thanks for your good suggestions. Under your instructions, we have added the relevant researches on Chinese populations in the introduction section and we hope it will be appropriate. Please see our revisions in the revised paper.

7. Methods are very verbose, and still do not provide enough information about the selection criteria. For example, what were “eligible cases”? Authors mention that students were recruited to investigate smoking prevalence and factors, however, later in the methods, the overall study recruitment objectives are different. The meaning of “...on the basis of socioeconomic status” is not clear. Similarly, “...based on number of students” is not clear.

Response: We all appreciate your valuable comments. As for the methods section, it is not so clear and a little verbose indeed. As you request, we have made the possible modifications to make the statements more concise and clearly. Please see them in the revised paper. Besides, in the first stage of drawing samples, 30 counties, including 12 urban areas and 18 rural areas were selected, which were the surveillance sites in Zhejiang Province. The surveillance sites were selected randomly on the basis of socioeconomic status, which can be referred to our previous description (Yu, M., Zhao, H.J., Rao, K.Q. Selection of public health surveillance sample for Zhejiang Province. Chinese Journal of Health Statistics 19, 151-154 (2002). (In Chinese)). In the second stage of sampling, we selected samples based on the number of students in each level of school, which is due to the method of Probability Proportionate to Size Sampling (PPS) we used.

8. I am not sure of the utility of using secondhand smoke exposure as a risk factor for smoking, particularly in a cross sectional study. Could the authors please explain and cite previous research? I also think it would be highly correlated with parents’ smoking status. Did the authors explore this before adding it to the multivariate model?

Response: Your question is very illuminating. As we all know, the sources of secondhand are various and adolescents may be exposed to secondhand inside or outside home. It is true that parents smoking is the main source of secondhand inside home and highly correlated with adolescent smoking, which have been extensively studied. However, except for parental smoking, peers or teachers smoking, as the important sources of secondhand outside home, are also reported to be associated with adolescent smoking. For our study, we did not collect the relevant peers or teachers smoking data and we think it is necessary to add the secondhand smoke exposure to the multivariate model to compensate the defects.

9. Please add the comparison or referent group throughout the results (in the abstract as well).

Response: Thanks for your reminder. As you request, we have added the referent group in the results sections. Please see them in the revised paper. As for the abstract, we cannot add the referent group due to the limits of the total words released by the journal and please forgive.

10. Please be consistent with the terminology throughout to refer to factors associated with smoking. As this is a cross sectional study, please do not use increasing or decreasing/reduced risk.

Response: We agree to your constructive suggestions. As a cross sectional study, the words of “increasing or decreasing risk” in our paper are inappropriate indeed. Under your careful instructions, we have revised the relevant statements thoroughly and hope it is up to the requirement for publication. Please see them in the revised paper.

11. For multilevel variables, it is not clear if significance testing was conducted to assess difference between each level. If not, please refrain from stating these differences (e.g. for age, increasing risk with age is mentioned).

Response: Thanks for your good questions. For the multilevel variables in our study, the significance



testing was not conducted to assess difference between each level. We only conducted the test between each level and the referent group. As your careful instructions and request, we have revised the inappropriate statements such as “increasing risk with age”. Please see it in the revised paper.

12. In discussion, it is not clear why authors chose Florida study, instead of a national study for comparison. Similarly, authors have mentioned that their results were similar to the 1998 study in the same province, which seems incorrect, as the prevalence in that study was 0.3%.

Response: The questions you proposed are very important. As for your doubt about our choose of Florida study, we want to make an explanation that our samples are selected from Zhejiang, one of the provinces of China and the results represent the provincial level of China. We think it is more appropriate and comparable to other results based on the same level, such as the Florida study. Consequently, we choose the data of Florida study, not a national study of USA. Besides, as for the 1998 study in Zhejiang Province, we want to apologize that our vague statements that make you misunderstood. In the discussion section, we use the terms “similar to” to express the meaning of same province, same study design of school-based, but not the similar prevalence of smoking among adolescents between the two surveys. From the latter sentences, our real meaning can also be detected. To make the statements more clearly, we have deleted the terms we used. Please see it in the revised paper and we hope it will satisfy you.

13. Please refrain from usage of “increased risk” and “reduction of risk” in the discussion.

Response: Thanks for your kind reminder. As our study design is cross sectional, we have changed our statements to show our results and deleted the “increased risk” and “reduction of risk” from our paper. Please see it in the revised manuscript.

14. On page 10, lines 54-56, authors mention results from another study, but do not correlate it well with their own.

Response: Thanks for your constructive suggestions. Indeed, the studies’ results we cite here are not correlated with our results and redundant. Consequently, as your request and instructions, we decide to delete them in the discussion section.

15. Limitations section is missing from the discussion.

Response: Thanks for your question. The limitations part is an essential part of a whole paper. However, as required by the journal, we have put the “Strengths and Limitations of this study” in front of introduction section. Please see it in the revised paper.

16. It would be useful to have clear recommendation and public health actions related to the results of this article. Authors found several demographic and socioeconomic factors associated with current smoking, however, it is difficult to take action on most of them. This would tie in with the relevance of such research.

Response: We all appreciate your precious suggestions. According to the analysis results in the study, we find several demographical and socioeconomic factors significantly associated with the current smoking among adolescents, such as older age, boys, and location of school. However, as reported by previous studies, the corresponding successful measures to prevent smoking among adolescents are rarely conducted and proposed. For our study, we confirm the findings and propose that attention should be focused on adolescents with the above factors in developing school-based antismoking policy and programmes. Besides, more effective specific measures to prevent smoking among adolescents based on our results are expected after we test them in practice in the future.

17. Please improve the titles of the tables.

Response: Thanks for your reminder. As your request, we have improved the titles of the tables based on what we showed. Please see it in the revised paper.

18. In the abstract, use of the term “relevant data” in the primary and secondary outcome measures is very vague.

Response: Thanks for your valuable advice. Indeed, in the abstract, the “relevant data” we used is too vague. To make our meaning more clearly to the readers, we have changed the expression and please see it in the revised paper.

## VERSION 2 – REVIEW

<b>REVIEWER</b>	Tushar Singh Centers for Disease Control and Prevention, Atlanta, GA, USA
<b>REVIEW RETURNED</b>	17-Dec-2015

<b>GENERAL COMMENTS</b>	The authors were able to edit the manuscript as requested. Thank you.
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