Reviewer's report

Title: Blood pressure and particulate air pollution in schoolchildren of Lahore, Pakistan

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Reviewer: Jin Hee Kim

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This manuscript details an analysis of the association of blood pressure and short-term particulate air pollution exposures in a cross-sectional study of schoolchildren in Lahore, Pakistan. The manuscript itself is for the most part well written. However, overall I think that some more refinement of the presentation would be greatly helpful. My specific comments are below:

Major Compulsory Revisions:

(1) In the abstract section, you should inform study period and particulate pollutants examined in detail. Your study includes 10-year-old age including other age range (8 to 12-year-old) and thus you should describe exactly the sentence in conclusions in abstract section.

(2) Background is too long and in background part, you should focus on why you selected particulate air pollution. Although PM has been reported to be an important factor on several health outcomes, gases such as NO2 and O3 could affect oxidative stress, which is related with cardiovascular outcome including hypertension.

(3) Based on the residential addresses and Google Earth, all the children lived in close proximity (within ~3 km) of their school. The distance between their school and home was not close, then how about the air pollution level near their home? Also, if you measure the level of PM on Monday, actually they might not be exposed to level of outdoor PM in school. Did you consider day of the week to measure the level of PM?

(4) The sole criteria to participate in the study were the prescribed age range, approval of parents and willingness of the participant. If so, which range of age was your target? Why target age was different between low pollution school (8~11) and high pollution school (9~11)? You should categorize the age in the Table 1. Also, 179 (94%) of the 192 children that were asked to participate agreed to participate in this study. If so, what is total number of school children? The 192 is total number of students attending both schools? You should inform the total number of students attending two elementary schools and difference between participants and no participants because of selection bias. Moreover, in your paper, you did not use endpoints such as spirometry and exhaled NO, thus you should omit the sentence “Several endpoints were investigated, including spirometry and exhaled NO, but this article will deal with BP and related data.”
Measurements of PM were obtained at the study sites (outdoors, but under a roof of the school playground) for at least 24 h before each examination day; for each subject, the average PM1, PM2.5 and PM10 values were calculated for the previous 24 h, with sampling periods of 2 min being taken at 10 min intervals. If sampling time was different among individuals, average PM1, PM2.5 and PM10 values calculated for the previous 24 h were different among individuals? And you collected urines 10 min after measurement of blood pressure? You should make clear the order of the incident. Also, you described the sentence “In addition, PM was also measured indoors between 10 am and 11 am on the examination days” The sentence meant indoor PM was measured for 1 hr? You should make clear what you mean in this sentence.

As you indicated in background part, smoking (or passive smoking) may be important in the analysis, but you did not adjust smoking (or passive smoking) variable in your model. You should describe the reason why you did not adjust the variable smoking (or passive smoking). Moreover, in your paper, what is function of calcium (Ca), why did you input calcium (Ca) data? Ca had no function in this paper and you didn’t use Ca as a covariate. If you want to put calcium (Ca) data in your paper, you should describe the reason why you put calcium (Ca) data.

You used height and weight instead of BMI even though BMI has been known to be an important factor for hypertension. How about the result after adjusting for BMI? It would also be useful to inform the result after adjusting for BMI instead of height and weight.

Logistic regression result should be your main finding for association between PM exposure and blood pressure, and thus you should show the table presenting the effect of PM on blood pressure. Although you described the odd ratio of 2.64 for those living in the area with high PM exposure compared with those living in the area with low PM in the result section, the odd ratio of 2.64 indicates the effect of region rather than the effect of PM. In the discussion part, you described the difference between two regions. But you did not find the effect of PM on blood pressure in each group, indicating that another factor presenting difference between two regions could affect the result. Thus, you should show the effect of PM on blood pressure and whether the result is consistent after adjusting school as covariate in your model.

Decimal digit number is different depending on the variables in Table 1 and Table 2. You should use equal decimal digit.

Overall, the discussion was long. It could use some editing, reorganization, and tightening of the points being made.

Level of interest: An article of importance in its field

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.