Reviewer’s report

Title: The protective effect of helmet use in motorcycle and bicycle accidents: a propensity score-matched study based on a trauma registry system

Version: 2 Date: 15 Mar 2017

Reviewer: Safa Abdalla

Reviewer’s report:

Thank you very much for responding to my comments. This is a very interesting study. The methodology has improved tremendously but there are a few things that still need to be done:

1. In tables 2 and 3, you should not use statistical significance tests and p-values to compare the covariates between the two groups before and after matching. The purpose of the comparison is to measure how big the difference is in the means/proportions between the helmet and non-helmet groups. Statistical significance tests test the probability of any difference (big or small) arising from chance in order to infer from a sample to a population. Therefore statistical significance testing makes no sense in this case of checking whether the matching has achieved its purpose within this particular sample, in addition to the fact that it is influenced by sample size. Therefore, as you did with the mean age, you should use the standardized difference for the gender and comorbidity variables too and remove any reference to odds ratios and p-values in those tables. The following paper has the formula for that:

2. Table 1 needs to be reserved to background characteristics only, namely demographics, obesity and comorbidity. Injury characteristics are outcome variables and need to be reported in a separate table with mortality for the analysis after matching. So far, results are repeated across tables, e.g. age, gender, comorbidity and mortality before matching show in table 1, 2 and 3. All other outcomes such as GCS, ISS, LOS and others only have the results reported in table 1 in the data before matching with no tabulated results for those outcomes after matching. Since your propensity score is now correctly based on the comparison groups and not on the mortality outcome, all outcomes can now be investigated in the matched data.

3. Tables 4 and 5 do not report the results after matching. The authors need to rerun the analysis for those outcomes using the matched data and report those results instead.

4. Acknowledge in your limitations that the results after matching depend on the specification of the logistic regression model and the potential confounders measured in this study. Therefore balance between the comparison groups regarding unmeasured confounders still cannot be guaranteed.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
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Yes

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