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: 0 Date: 15 Nov 2016

Reviewer: Safa Abdalla

Reviewer’s report:

This is a very interesting paper on the effect of helmet use on mortality following bicycle or motorcycle traffic injury. The authors used trauma registry data to compare in-hospital mortality, ICU admission rate and length of stay in hospital and in ICU between helmet users and non-helmet users, accounting for non-randomization with propensity score matching. They found that helmet use among motorcyclists reduced mortality and length of stay but there is no evidence of an effect among bicyclists. Overall, this is a well-conducted study and well-written report but may benefit from some essential clarifications detailed below:

Abstract: background should give a background not the objective.

Methods:

Please give more details about the Trauma Registry. E.g. which patients does it include and which does it exclude. For how long is a patient followed up. If they are discharged but their condition later deteriorates and are re-admitted, are they still captured in the registry? Please add as much relevant information about the registry as possible.

The analysis should report much more that what is currently reported:

- please add more details on the regression model used to calculate propensity scores, what was the dependent variable and what were the independent variables?

- Please add more details on the greedy algorithm used for matching. What was the caliper used? What was the software used? Did you write your own script for matching (give more details if so), was it an independent script (please add a reference if so)? In all cases, you should clarify your inputs into the algorithm.

- There is no mention in the methods or the results of how the balance between those who used a helmet and those who didn't was checked. Please compare those two groups with regard to the potential confounders using standardized difference (statistical significance is not recommended) and report in a table. Currently, there is no such table among the results. The only table compares the outcome by covariates before and after matching.
Results:

Tables 1-3 report odds ratio for the all categories of categorical variables, but none of those seems to have a referent OR of 1, why? each categorical variable should have one reference category. It becomes hard to judge the results and p-values before understanding what was really done.

Discussion:

In the limitations section, what about on-site deaths? Could their exclusion bias the results? The authors need to give an indication of the direction and predicted extent of this potential bias, informed by the proportion of on the site deaths among those groups of road users?

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

Unable to assess

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?
If not, please explain in your comments to the authors.

Unable to assess

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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