Author's response to reviews

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

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Author’s response to reviews:

Dear Reviewer #1

Thank you for your time, effort and professional comments in regard to our manuscript entitled “The protective effect of helmet use in motorcycle and bicycle accidents: a propensity score-matched study based on a trauma registry system” to BMC Public Health. I have revised the document according to your suggestions and highlighted those areas in pink color.

1. It would be helpful to include more recent references in your paper to provide a more recent context to your work.

Answer:

Under your kind suggestion, we have replaced some of the older references with more recent references. Thank you for the professional advice.

This article had revised under your kind suggestion and we hope that will satisfy your standard. If required, we are very delighted to make further change or revision.

Ching-Hua Hsieh, M.D. Ph.D, FACS

Department of Plastic and Reconstructive Surgery, Kaohsiung Chang Gung Memorial Hospital, Chang Gung University College of Medicine, Taiwan.
Dear Reviewer #2

Thank you for your time, effort and professional comments in regard to our manuscript entitled “The protective effect of helmet use in motorcycle and bicycle accidents: a propensity score–matched study based on a trauma registry system” to BMC Public Health. I have revised the document according to your suggestions and highlighted those areas in yellow color.

1. Is there any difference between single user and double users of a motor bike?

Answer:

Because our Trauma Registry System did not include this information, we could not answer this question. However, it is a good point and we will include this as one of our study limitations.

2. Is there any difference between user and nonuser of helmet by the riders who were riding the bike together?

Answer:

Similarly, because our Trauma Registry System did not include this information, we could not answer this question. We will also include this as one of our study limitations.

3. Is there any data on the speed of the motor bike by types of accidents and its health hazard?

Answer:

Similarly, because our Trauma Registry System did not include this information, we could not answer this question. We will also include this as one of our study limitations.

4. This is a recorded data reported from the hospital. What happens to them those who are not going to that kind of hospital?

Answer:

Generally, patients that were severely injured or patients that had possible severe injuries would be sent to the closest level I trauma center in Taiwan. Because this study is based on the Trauma Registry System of a level I trauma center, we can only assume that those who were not brought to a level I trauma center only sustained minor injuries that were not life-threatening. We will also include this as one of our study limitations.

This article had revised under your kind suggestion and we hope that will satisfy your standard. If required, we are very delighted to make further change or revision.

Ching-Hua Hsieh, M.D. Ph.D, FACS
Dear Reviewer #3

Thank you for your time, effort and professional comments in regard to our manuscript entitled “The protective effect of helmet use in motorcycle and bicycle accidents: a propensity score–matched study based on a trauma registry system” to BMC Public Health. I have revised the document according to your suggestions and highlighted those areas in green color.

1. Abstract: background should give a background not the objective.

Answer:

Yes. Under your kind suggestion, we will replace the word “background” with the word “objective”.

2. 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.

Answer:

- The inclusion and exclusion criteria were summarized in the following flow chart, which would be added as Figure 1 in the revised manuscript. In addition, we had indicated in the revised manuscript regarding the exclusion criteria as “Patients who had sustained an injury other than motorcycle or bicycle accident or whose registered data were incomplete were excluded.” The patients were followed up during the course of admission, which ends with discharge or death. Therefore, we had indicated in the manuscript that what we investigated is
“in-hospital mortality”. If a patient was discharged but his/her condition later deteriorated, he/she would not be included in this registry because he/she would not be a case of primary trauma-related injury, and as a result, he/she would not be included in our study.

- We had revised the description regarding propensity score calculation with dependent and independent variables and we had listed the calculation and the results as the supplementary table 1 in the revised manuscript.

- We use the optimal method in creating a 1:1 matched study groups with a 0.2 caliper width. The greedy method in our prior description is wrong and we had changed that accordingly in the revised manuscript. In addition, we had used the NCSS software and did not use the script by ourselves. We had also indicated that in the revised manuscript to make it clear.

- After propensity-score matching, the standardized differences of pair of patients in motorcycle and bicycle accident was decreased from -47.16% to -0.19% and from -43.70% to 0.19%, respectively. We had indicated that in the Supplementary table 2 of the revised manuscript. In addition, the balance between those who used a helmet and those who didn't was checked and described in the Supplementary table 2 and in the revised manuscript.

3. 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.

Answer: It is because the comparison we made is not to indicate the relative risk for a specific dependent outcome. Using co-morbidity for example, we are not going to show that a DM patients had a 3.5 OR of mortality, and HTN patients had a 2.1 OR of mortality when compared to the healthy one, who had an OR of 1. Because what we show here is their association with the status of helmet use (but not the dependent variable like mortality), it is unreasonable to demonstrate DM or HTN had an OR of value than healthy one regarding the status helmet use. The comparison is made between DM vs. non-DM, HTN vs. non-HTN, CAD vs. non–CAD and so on. Such kind of presentation had been quite commonly used in our and others’ publication in the literature.

4. 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?

Answer: Yes, the exclusion of on-site deaths in this study could bias the result. If we put on-site deaths into consideration, the “true mortality” would be a little bit higher than reported in this study, albeit the on-site mortality is few in the scenario of our emergency department. Notably, because there were more on-site deaths in motorcycle crashes than in bicycle crashes in our hospital, the extent of difference in terms of mortality in this study would be expected to be greater in the
motorcyclists compared with that in the bicyclists. We will include this as one of our study limitations.

This article had revised under your kind suggestion and we hope that will satisfy your standard. If required, we are very delighted to make further change or revision.

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