PEER REVIEW HISTORY

BMJ Paediatrics Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Childhood injuries in Oman: Retrospective review of a multicenter trauma registry data
AUTHORS	Mehmood, Amber; Agrawal, Priyanka ; Allen, Katharine; Al-Kashmiri, Ammar; Al-Busaidi, Ali; Hyder, Adnan

VERSION 1 – REVIEW

REVIEWER	Reviewer name: Emmanouil Bagkeris Institution and Country: University College London Competing interests: No competing interests
REVIEW RETURNED	06-Jun-2018

GENERAL COMMENTS	1. Perhaps consider the time of the data collection as a potential limitation of the study. Children are going to the school between November and April. This may be affecting the injuries risk. 2. Refer to the analyses as univariable and multivariable. Univariate and multivariate refers to analyses with multiple outcomes and this is not the case in the manuscript. 3. Consider reporting only the results of the final multivariable model across the whole manuscript. Also include the unadjusted estimates for the variables of the multivariable model. 4. Please report at the abstract the number (%) of the patients that underwent surgical treatment. Add this information on table 1. 5. Consider fitting Poisson regression models with robust standard error considering that the surgical treatment is not a rare event (above 10%). Advice and cite Knol, Mirjam J. et al. “Overestimation of Risk Ratios by Odds Ratios in Trials and Cohort Studies: Alternatives to Logistic Regression.” CMAJ : Canadian Medical Association Journal 184.8 (2012): 895–899. PMC. Web. 6 June 2018. 6. At the results section, please report the decimal places of the percentages in a consistent way. Zero, one or two decimal places are used currently.

REVIEWER	Reviewer name: Dr Ian Lewins Institution and Country: University Hospitals of Derby and Burton, Children's Emergency Department, UK Competing interests: None
REVIEW RETURNED	16-Jul-2018

GENERAL COMMENTS	1) My main question to the authors would be on how representative the two hospitals in which the registry was compiled are for the rest of Oman. I work in a trauma unit but not a trauma centre in the UK and the injuries that I see may not be representative of the injuries seen in a larger major trauma centre. Is the data complied therefore at these 2 larger hospitals seeing the more ever end of the spectrum compared with more rural units and how have the authors accounted for this?

	2) How did the authors ensure intra- and inter-observed validity of trauma scoring undertaken by the nursing team as part of the data collection? 3) The upper part of Table 2 (external cause) has become mis-aligned owing to the 'falls' column and makes the table confusing - this needs re-formatting. 4) How is 'care at the scene' defined and were the same definitions used throughout? 5) Table 3 states that 147 children had care at the scene and 295 did not. If however the total number of children in the study is 795 as described in table 2 there appear to be 353 children unaccounted for. 6) Similarly in table 3 the mode of transport data accounts for 727 children so again the data is missing for 68 children. 7) on p15 line 43 it states that "8.3% reached the hospital from the scene of injury within 60 minutes" - this contradicts the data in the table above which is unlabeled. It should read "within 30 minutes". 8) p 16 line 53 states that "patients admitted to the regional referral centre were 3.27 times likelier to receive surgery..." - have the authors commented on why they think this might be. 9) Did the authors look at the type of surgery involved and did they differerentiate at all between 'minor surgery' eg reduction of fracture under analgesia and sedation in the ED and 'major surgery' eg surgical reduction and fixation of fracture under GA? 10) Did the authors examine length of stay at an end point?

VERSION 1 – AUTHOR RESPONSE

Reviewer # 1:

Response:

Thank you for your constructive feedback. It helped us in revising the manuscript and presenting it in a more meaningful manner.

1. Perhaps consider the time of the data collection as a potential limitation of the study. Children are going to the school between November and April. This may be affecting the injuries risk.

Response:

Thank you for this important feedback. Since this study did not aim to report annual incidence, prevalence or seasonal variations of risk of injuries and surgical treatment, this was considered a limitation for reporting the results. The analysis is limited to the data obtained from two large hospitals but does not include data from other facilities caring for pediatric patients.

2. Refer to the analyses as univariable and multivariable. Univariate and multivariate refers to analyses with multiple outcomes and this is not the case in the manuscript.

Response:

Thank you very much for this important observation. We have corrected this in the revised draft.

3. Consider reporting only the results of the final multivariable model across the whole manuscript. Also include the unadjusted estimates for the variables of the multivariable model.

Response:

Thank you very much for this important feedback. We have reported only adjusted results in the revised draft.

4. Please report at the abstract the number (%) of the patients that underwent surgical treatment. Add this information on table 1.

Response:

We have included this information in abstract and in Table 3, where “care of the injured patients” is described.

5. Consider fitting Poisson regression models with robust standard error considering that the surgical treatment is not a rare event (above 10%). Advice and cite Knol, Mirjam J. et al. “Overestimation of Risk Ratios by Odds Ratios in Trials and Cohort Studies: Alternatives to Logistic Regression.” CMAJ : Canadian Medical Association Journal 184.8 (2012): 895–899. PMC. Web. 6 June 2018.

Response:

Thank you for this constructive and useful suggestion. Univariable and multivariable Poisson regression models with robust standard error were derived and have been reported in the revised draft instead of multivariable logistic regression model.

6. At the results section, please report the decimal places of the percentages in a consistent way. Zero, one or two decimal places are used currently.

Response:

Thank you for this suggestion, we have reported one decimal places for the percentages in the revised draft.

Reviewer #2:

Response:

Thank you for your constructive feedback. We have tried to address your comments and queries as follows.

Comments to the Author

1) My main question to the authors would be on how representative the two hospitals in which the registry was compiled are for the rest of Oman. I work in a trauma unit but not a trauma centre in the UK and the injuries that I see may not be representative of the injuries seen in a larger major trauma centre. Is the data complied therefore at these 2 larger hospitals seeing the more ever end of the spectrum compared with more rural units and how have the authors accounted for this?

Response:

Thank you for your comment and observations. Trauma care capabilities are limited in Oman and are mostly located in the northern coastal urban tertiary care centers of the capital Muscat, Al Batinah, and Ad-Dakhliya regions.

Among the tertiary care referral centers under the Ministry of Health, Khoula Hospital is the only national trauma referral hospital, and Nizwa hospital is the regional trauma referral center. Together these two centers cater for majority of general trauma, orthopedics, plastics and neurosurgical cases in the Muscat and Ad-Dakhliya regions, that includes rural population. Other trauma centers such as Sohar hospital is located in a coastal industrial area and serves as primary surgical facility for industrial workers and laborers with work-related injuries. Oman's primary health care system is very robust; minor injuries are dealt at the "see-and-treat" rural/ semi-urban health centers and referred to larger centers if required. Due to lack of pediatric specialists in many such small hospitals, children are often referred for specialist opinion or further treatment to secondary and tertiary care hospitals. Therefore, these two hospitals reflect the burden of trauma in national and regional level, covering both urban and rural population as well as all ranges of injury severity for pediatric population.

2) How did the authors ensure intra- and inter-observed validity of trauma scoring undertaken by the nursing team as part of the data collection?

Response:

We used multiple strategies to ensure validity of injury scoring systems used in the mHealth registry. First, we conducted training workshops that included injury data abstraction from medical charts, data entry on a mobile device, injury coding such as e-codes, ICD- 10-CM, and basic principles for various scaling and scoring systems including the Abbreviated Injury Score (AIS), Revised Trauma Score (RTS) and Injury Severity Score (ISS). Second, a user guide was developed to outline the step-by-step details of data collection, and to provide a quick reference for ICD codes and ISS calculation. Third, we used simplified descriptors for AIS codes, to help data collectors to assign an injury severity for each injury. It meant that the data collectors would look into the medical charts, radiology reports, surgical and nursing notes for injury description, and match the AIS descriptor for that injury. At the backend of the electronic software, respective AIS descriptors were automatically assigned a severity code and backend calculator generated ISS (as well as RTS scores with vital signs information). This reduced the chance of misclassification and errors in injury score calculation. Finally, we provided constant supervision for data collectors who sought guidance in finalizing ICD and Abbreviated Injury Scaling (AIS) codes in difficult or complex cases. Data was cross checked and validated with the charts on a regular basis during the study period.

All these details are outlined in a previous paper:

Mehmood, A., et al., Development of an mHealth trauma registry in the Middle East using an implementation science framework. Global health action, 2017. 10(1): p. 1380360.

https://www.tandfonline.com/doi/full/10.1080/16549716.2017.1380360

3) The upper part of Table 2 (external cause) has become mis-aligned owing to the 'falls' column and makes the table confusing - this needs re-formatting.

Response:

Thanks for the observation, this has been corrected.

4) How is 'care at the scene' defined and were the same definitions used throughout?

Response:

Care at the scene included the following options and same definitions were used throughout:

1 Oxygen supplement

2 C-spine immobilization (collar)

3 Fracture immobilization

4 Control of bleeding

5 Wound care

6 IV fluids

7 Intubation

8 Needle decompression

9 CPR

10 Others

5) Table 3 states that 147 children had care at the scene and 295 did not. If however the total number of children in the study is 795 as described in table 2 there appear to be 353 children unaccounted for.

Response:

Thanks for this important observation. This is missing information and now mentioned in Table 3.

6) Similarly in table 3 the mode of transport data accounts for 727 children so again the data is missing for 68 children.

Response:

Thanks for this important observation. This is missing information and now mentioned in Table 3.

7) on p15 line 43 it states that "8.3% reached the hospital from the scene of injury within 60 minutes" - this contradicts the data in the table above which is unlabeled. It should read "within 30 minutes".

Response:

Thank you for this important observation. We have corrected it in the revised draft.

8) p 16 line 53 states that "patients admitted to the regional referral centre were 3.27 times likelier to receive surgery..." - have the authors commented on why they think this might be.

Response:

We initially thought that patients who are taken to Nizwa hospital were more likely to receive emergency surgical procedures required to stabilize the patients. However, as per the suggestion of Reviewer 1, we conducted a Poisson regression model. According to the new results, the effect of the regional hospital on surgical treatment has been diminished.

9) Did the authors look at the type of surgery involved and did they differentiate at all between 'minor surgery' eg reduction of fracture under analgesia and sedation in the ED and 'major surgery' eg surgical reduction and fixation of fracture under GA?

Response:

We do have detailed information about the type of surgery performed in all patients, however we did not include this as an independent variable in the regression analysis.

10) Did the authors examine length of stay at an end point?

Response:

Yes, we examined the in-hospital length of stay, but there was no statistically significant difference in the mean length of hospital for patients who underwent surgery versus those who did not.

VERSION 2 – REVIEW

REVIEWER	Reviewer name: Emmanouil Bagkeris Institution and Country: University College London, UCL UK Competing interests: No competing interest
REVIEW RETURNED	23-Aug-2018

GENERAL COMMENTS	Dear authors, thank for considering my comments. There are some minor corrections suggested below: The Poisson regression models provide estimates of relative risks. Please correct table 4 and the text to indicate that the estimates reported are relative risks and not odds ratios (RRs and not ORs). Your wording should also be corrected accordingly from “more likely” to “increased risk”.

VERSION 2 – AUTHOR RESPONSE

Reviewer # 1:

The Poisson regression models provide estimates of relative risks. Please correct table 4 and the text to indicate that the estimates reported are relative risks and not odds ratios (RRs and not ORs). Your wording should also be corrected accordingly from “more likely” to “increased risk”.

Response:

Thank you for highlighting this error. We have edited the table 4 and revised the results section to highlight RRs instead of ORs.