

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	SYSTEMATIC REVIEW OF RISK FACTORS ASSOCIATED WITH QUAD BIKE CRASHES: A PROTOCOL FOR SYSTEMATIC REVIEW OF OBSERVATIONAL STUDIES.
AUTHORS	Menon, Preetha; El-Sadig, Mohamed; AB Khan, Moien; Östlundh, Linda; El Deyarbi, Marwan; Al-Rifai, Rami H.; Grivna, Michal

VERSION 1 – REVIEW

REVIEWER	S.Stephens Royal Brisbane and Women's Hospital, Australia
REVIEW RETURNED	04-Oct-2020

GENERAL COMMENTS	<p>This is a topical injury mechanism, one of which that is lacking quality risk assessment and data on demographics and injuries. This review is welcomed.</p> <p>The authors however do limit the review to on off road and while ATVs are largely used for off road recreational and industrial purposes, excluding injuries suffered on roads through their use in less affluent countries and in the tourism industry may limit the search and applicability of this review. This factor should be addressed or included as a limitation.</p> <p>Various attempts have been made to improve the safety of this vehicle for off road including the use of closed cabin. The proposed review aims to only include "open, saddle seated" vehicles in the included studies. A discussion using risk assessment tools including Haddon matrix should ideally also include or mention observational studies looking at closed/caged vehicles</p>
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REVIEWER	Li Lu Bordeaux Population Health Research Center, UMR U1219, INSERM, Université de Bordeaux
REVIEW RETURNED	01-Dec-2020

GENERAL COMMENTS	<p>This is a protocol for systematic review of observational studies focusing on "factors associated with quad bike crashes". Several issues should be addressed first prior to publication for <i>BMJ open</i>. I have some comments as follows:</p> <p>Background</p> <ul style="list-style-type: none">- Para2: Put relative citations.- Para5: "A systematic and an objective review of existing scientific literature can highlight the possible risk factors associated with quad bikes". Please correct this sentence that
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	<p>should be "...associated with the quad bikes crashes".</p> <ul style="list-style-type: none"> - Para6: "This study will attempt to develop a more rigorous method of reviewing studies on quad bike injury prevention, using the predominant observational studies". As I understand, your study is focus on associated factors of quad bikes crashes rather than the "prevention"? <p>Research Question:</p> <ul style="list-style-type: none"> - As you mentioned in Para7 of Background part, "uneven terrain", if "crash on uneven terrain" is one of the inclusion criteria, I would suggest to give a clear definition of "uneven terrain". <p>Objectives</p> <ul style="list-style-type: none"> - I am confused about the first and the second objective, are you going to identify the factors associated with crashes leading to injury, as well as the factors related to the prior factors? <p>Methods</p> <ul style="list-style-type: none"> - Inclusion criteria: Only qualitative studies are going to be included? As I know, observational studies not only refer to qualitative studies but quantitative studies. Some studies provide results from both qualitative and quantitative analyses. - Study population: "All quad bike riders are subject for the study". Both riders involved in crash or those did not involve in a crash will be included? Or do you mean a crash includes as least one quad bike rider? - Study outcome: If you just focus on those crashes lead to health outcomes ranging from injuries to disability or death, I would recommend to re-adjust the inclusion and exclusion, due to there were still some crashes without injuries. - Exclusion criteria, Source: why will you exclude "news articles"? - Search Strategy: I recommend to clearly list the search words list. And do not to mix inclusion, exclusion criteria and search strategy. And, are there two authors conducting the literature search? You also need to indicate the databases you search in this part not only just in abstract. - Bias minimization "Data extraction process will be audited by three reviewers MS, MK, MG and LO to...", you listed four reviewers rather than three. <p>I recommend authors to reorganize the structure to make each part clearly indicate its own content.</p>
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VERSION 1 – AUTHOR RESPONSE

<p>Reviewer: 1 Dr. Sean Stephens, Royal Brisbane and Women's Hospital</p> <p>Comments to the Author: This is a topical injury mechanism, one of which that is lacking quality risk assessment and data on demographics and injuries. This review is welcomed.</p> <p>The authors however do limit the review to on off road and while ATVs are largely used for off road recreational and industrial purposes, excluding injuries suffered on roads through their use in lessaffluent countries and in the tourism industry may limit the search and applicability of this review. This factor should be addressed or included as a limitation.</p>	<p>We thank the reviewer for his supportive comments which were extremely useful in improving the quality of the protocol. We have made the following corrections in the Inclusion criteria- Study Environment in line number 135</p> <p>Study environment</p> <p>The results of this review will be systematically evaluated, thematically synthesized and analyzed using the Haddon Matrix which, help to identify the risk factors related to personal attributes, vector or agent attributes and environmental attributes; before, during and after injury or death. The vehicle / vector related risk factors of a quad bike on paved roads are clearly different from those on unpaved roads [16, 17]. The vehicle related protective features for on-road safety, like seatbelts, sometimes contradicts basic quad bike protective features on uneven terrain like active dismount [18]. This is because the injury mechanism on roads, due to head on collision crashes, is different from that of off-road injuries [rollover, ejection] [19, 20]. Therefore, to increase the specificity of the review, articles describing paved road crashes and uneven terrain crashes must be included, but synthesized separately.</p> <p>We have also added 'paved roads' when mentioning terrain in line number 97,141, 146,175, and 299.</p>
<p>Various attempts have been made to improve the safety of this vehicle for off road including the use of closed cabin. The proposed review aims to only include "open, saddle seated" vehicles in the included studies. A discussion using risk assessment tools including Haddon matrix should ideally also include or mention observational studies looking at closed/caged vehicles</p>	<p>We are very grateful to the reviewer for his valuable suggestions for improving the definition of the vehicle under review. We have made the following addition to vehicle definition in line number 128:</p> <p>It may or may not have roll over protection structures like roll cage, quad bar or lifeguard.</p>
<p>FORMATTING AMENDMENTS (if any) Required amendments will be listed here; please include these changes in your revised version: 1. Embedded supplementary appendix: - Kindly remove all your Supplementary Appendix in your Main Document and upload it separately under file designation "Supplementary File" in PDF Format.</p>	<p>During the revision process, manuscript has undergone substantial changes without impacting the objectives, methods, and interpretation of findings as in our first submission. We have removed Supplementary Appendix from the main document. A separate supplementary document, which contains Search String, data extraction form, Screening checklist and Mixed Methods Assessment Tool, under the designation</p>

	<p>“Supplementary File” in PDF format has been added.</p>
<p>2. Patient and Public Involvement: - We have implemented an additional requirement to all articles to include 'Patient and Public Involvement' statement within the main text of your main document. Please refer below for more information regarding this new instruction:</p> <p>Authors must include a statement in the methods section of the manuscript under the sub-heading 'Patient and Public Involvement'.</p> <p>This should provide a brief response to the following questions:</p> <p>How was the development of the research question and outcome measures informed by patients' priorities, experience, and preferences? How did you involve patients in the design of this study? Were patients involved in the recruitment to and conduct of the study? How will the results be disseminated to study participants? For randomised controlled trials, was the burden of the intervention assessed by patients themselves?</p> <p>Patient advisers should also be thanked in the contributorship statement/acknowledgements. If patients and or public were not involved please state this.</p>	<p>Thank you for identifying this gap. We have added statements on Patient and Public Involvement in Line number 248:</p> <p>Patient and Public Involvement No patients or individuals from the public will be involved in this review. Patient consent is not required for this review.</p>
<p>This is a protocol for systematic review of observational studies focusing on “factors associated with quad bike crashes”. Several issues should be addressed first prior to publication for <i>BMJ open</i>. I have some comments as follows: Background - Para2: Put relative citations.</p>	<p>Thank you for identifying this weakness on articles throwing light on the public health and economic burden of quad bike injuries. We have added the citations at the correct position. Seen in line number 61-65.</p> <p>Bohl S. All- Terrain Vehicle Related Injuries and Hospitalization An Examination of the Influence of Age and Substance Abuse. Doctoral Dissertation. Minnesota 2010.</p> <p>Lower T, Pollock K, Herde E. Australian quad bike fatalities: what is the economic cost? <i>Aust N Z J Public Health</i> 2013;37(2):173–78.</p>
<p>Para5: “A systematic and an objective review of existing scientific literature can highlight the possible risk factors associated with quad bikes”. Please correct this sentence that should be “...associated with the quad bikes crashes”.</p>	<p>Thank you for identifying this error. As you rightly pointed out, this review focuses on all risk factors related to quad bike crashes. We made the correction in line number 87.</p> <p>In the absence of a standardized methodology for systematic review of the risk factors of quad bikes crashes and injuries, it was a challenge to develop a protocol to meet the objectives of the study and maintaining the quality of the review [13]. This study will attempt to develop</p>

	<p>a more rigorous method to review studies on quad bike crashes and injuries, using the predominant observational studies.</p>
<p>- Para6: “This study will attempt to develop a more rigorous method of reviewing studies on quad bike injury prevention, using the predominant observational studies”. As I understand, your study is focus on associated factors of quad bikes crashes rather than the “prevention”?</p>	<p>Thank you for highlighting ambiguity in this sentence. We have made the following correction in lines number 86:</p> <p>This study will attempt to develop a more rigorous method to review studies on quad bike crashes and injuries, using the predominant observational studies..</p>
<p>Research Question: - As you mentioned in Para7 of Background part, “uneven terrain”, if “crash on uneven terrain” is one of the inclusion criteria, I would suggest to give a clear definition of “uneven terrain</p>	<p>Thank you for this suggestion on improving the terrain definition for our review. For this definition, we referred to the paper (Hicks, 2018). We have made the following addition in line number 138.</p> <p>We define uneven terrain as those surfaces that lack smooth surface or have surface irregularities. These include slopes, sand dunes, dirt track, unpaved surfaces, gravel, grass or agricultural workplace environment.</p> <p>Reference: Hicks D, Grzebieta R, Mongiardini M, et al. Investigation of when quad bikes rollover in the farming environment. <i>Safety Science</i> 2018; 106:28–34.</p>
<p>Objectives - I am confused about the first and the second objective, are you going to identify the factors associated with crashes leading to injury, as well as the factors related to the prior factors?</p>	<p>Many thanks for your useful comments. Following your guidance, we further clarified our objectives in much details; lines 104-108.</p> <ol style="list-style-type: none"> 1. To identify the risk factors and protective factors for crashes related to quad bike use on paved roads and uneven terrain. 2. To classify these risk factors into personal, engineering and environmental risk factors.
<p>Methods - Inclusion criteria: Only qualitative studies are going to be included? As I know, observational studies not only refer to qualitative studies but quantitative studies. Some studies provide results from both qualitative and quantitative analyses.</p>	<p>Thank you for pointing out this inaccurate sentence. We have omitted the sentence and have updated the text in line 116: in Inclusion Criteria-Study design</p> <p>The review will comprise of all observational studies, including cross-sectional analytical studies, case-control studies, prevalence studies, surveys, mixed methods and</p>

<p>- Study population: “All quad bike riders are subject for the study”. Both riders involved in crash or those did not involve in a crash will be included? Or do you mean a crash includes as least one quad bike rider?</p>	<p>qualitative studies.</p> <p>Thank you for identifying this vague definition of the target population. As mentioned earlier, studies on quad bike drivers that experienced at least one crash is subject for inclusion. However, experimental studies, not using live subjects, are also included to identify vehicles' related risk factors.</p> <p>We have made the following correction in line 125</p> <p>All quad bike riders who experienced crashes are subjects for the study review. Therefore, studies and reports targeting quad bike drivers of all regions, age groups, occupational groups and gender will be included in this the review.</p>
<p>- Study outcome: If you just focus on those crashes lead to health outcomes ranging from injuries to disability or death, I would recommend to re-adjust the inclusion and exclusion, due to there were still some crashes without injuries.</p>	<p>We appreciate your recommendation. We made the following changes in lines number: 133</p> <p>All studies and reports related to quad bike quad bike crashes with health crashes resulting in outcomes ranging from no injuries to disability or death will be included in the review.</p>
<p>- Exclusion criteria, Source: why will you exclude “news articles”?</p>	<p>News articles that do not cite any sources will be excluded while screening. Blogs, opinions and article information without evidence in the form of high quality study results could compromise the data quality.</p> <p>We have updated our Exclusion Criteria – Source in line 151-153.:</p> <p>Blog posts, opinion articles, editorials, advertisement brochure and news articles that do not cite primary source or research findings will be excluded from data extraction as they may compromise the data quality. However, they will be included to the screening list as hand searched references.</p>
<p>- Search Strategy: I recommend to clearly list the search words list. And do not to mix inclusion, exclusion criteria and search strategy.</p> <p>And, are there two authors conducting the literature search?</p> <p>You also need to indicate the databases you search in this part not only just in abstract</p>	<p>Thank you for pointing out the lack of clarity in our list of ‘search words’ we used. We have attached the search string developed for this review in the ‘Supplementary File’. We have described the nature of the search terms relating to vehicle and to the risk factors in lines:179:</p> <p>Thus, our search terms will focus on the nomenclature related to quad bikes to specify target population and broad risk related terms. Search string will include vehicle related terms like “Quad bikes”, “All terrain Vehicle”, “Four wheel ATV” etc and risk related terms such as</p>

	<p>“Safety”, “Risk” or “Cause”. Detailed search string is available in the supplementary file. This combination of target population and risk exposure keywords yielded maximum number of articles on pre-search trials.</p> <p>Thank you for helping us improve the repeatability of this review by specifying the databases involved. We have made the following changes in abstract and manuscript in lines numbers: 191.</p> <p>The published literature will be the primary sources of our research through a systematic search in PubMed, Scopus, Embase, PsycInfo, IEEE and Web of Science. The grey literature will be sourced from Proquest Thesis and Dissertations, OpenGrey and BASE. A copy of the pre-searches in PubMed is available in supplementary materials.</p> <p>The change made in the abstract in line number 28:</p> <p>PubMed, Embase, Scopus, Web of Science, IEEE and PsycInfo. Proquest Dissertation and Thesis, OpenGrey, and BASE will be searched for grey literature</p>
<p>- Bias minimization “Data extraction process will be audited by three reviewers MS, MK, MG and LO to...”, you listed four reviewers rather than three.</p>	<p>Thank you for identifying this error. We made the following correction in lines numbers 286</p> <p>Data extraction process will be audited by five reviewers MS, MK, MG, RHA and LÖ to ensure adherence to inclusion and exclusion criteria, minimize transcription errors and bias.</p>
<p>I recommend authors to reorganize the structure to make each part clearly indicate its own content.</p>	<p>Thank you for pointing out these flaws. We have rearranged and reorganized the sections under inclusion criteria, exclusion criteria, search strategy and data extraction.</p>

VERSION 2 – REVIEW

REVIEWER	Dr Sean Stephens Queensland Health, Australia
REVIEW RETURNED	17-Feb-2021

GENERAL COMMENTS	Nil further to add
REVIEWER	Li Lu Bordeaux Population Health Research Center, UMR U1219, INSERM, Université de Bordeaux
REVIEW RETURNED	27-Feb-2021
GENERAL COMMENTS	Authors have addressed my previous comments, I do not have other comments.