# Appendix I: PubMed search strategy

Search (((((("Ethiopia"[Title/Abstract] OR "Tigray"[Title/Abstract] OR "Amhara"[Title/Abstract] OR "SNNPR"[Title/Abstract] OR "Oromia"[Title/Abstract] OR "Addis Ababa"[Title/Abstract]))) AND (("cross sectional"[Title/Abstract] OR "observational"[Title/Abstract] OR " retrospective"[Title/Abstract]))) AND (("prevalance"[Title/Abstract] OR "pattern"[Title/Abstract] OR "epedemiology"[Title/Abstract] OR "mortality"[Title/Abstract]))) AND (("trauma"[Title/Abstract] OR "injury"[Title/Abstract]))) AND (("head injury"[Title/Abstract] OR " traumatic brain injury"[Title/Abstract] OR " head[Title/Abstract] AND neck injury"[Title/Abstract]))

# Appendix II: JBI Critical Appraisal Checklist for Analytical Cross Sectional Studies

Reviewer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Author \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Year \_\_\_\_\_\_\_\_\_\_\_\_Record Number \_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Yes | No | Unclear | Not applicable |
| 1. Were the criteria for inclusion in the sample clearly defined?
 | □ | □ | □ | □ |
| 1. Were the study subjects and the setting described in detail?
 | □ | □ | □ | □ |
| 1. Was the exposure measured in a valid and reliable way?
 | □ | □ | □ | □ |
| 1. Were objective, standard criteria used for measurement of the condition?
 | □ | □ | □ | □ |
| 1. Were confounding factors identified?
 | □ | □ | □ | □ |
| 1. Were strategies to deal with confounding factors stated?
 | □ | □ | □ | □ |
| 1. Were the outcomes measured in a valid and reliable way?
 | □ | □ | □ | □ |
| 1. Was an appropriate statistical analysis used?
 | □ | □ | □ | □ |

Overall appraisal: Include □ Exclude □ Seek further information □

Comments (Including reason for exclusion)

**Appendix III: Preferred Reporting Items for Systemic Reviews and Meta-Analysis (PRISMA)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Section/topic** | **#** | **Checklist Items** | Reported on page # |
|  |  | **TITLE** |  |
| Title  | 1 | **The burden of Traumatic Brain Injury among trauma patients in Ethiopia: systemic review and meta-analysis** | 1 |
|  **ABSTRACT**  |  |
| Structured summary  | 2 | **Background:** Traumatic Brain Injury is the common cause of mortality and disability in the young age population particularly in children and adolescents. Global burden of disease study report showed that prevalence of Traumatic Brain Injury was 55.50 million worldwide in 20016 with 8.1 million years of life lived with disability (YLD) and Sub-Saharan Africa accounted for 2.9 million cases of Traumatic Brain Injury. The objective of this review is to assess the prevalence of Traumatic Brain Injury in Ethiopia. **Methods:** A three-stage search strategy was conducted on PubMed/Medline, Science direct and African Online Journal and a grey literature search were conducted on Google scholars. The data analysis was conducted with R software version 3.6.1. The Heterogeneity among the included studies was checked with forest plot, χ2 test, I2 test, and the p-values. **Results:** The pooled prevalence of Traumatic Brain Injury in Ethiopia was 20% (95% confidence interval, 11 to 32, 12). Subgroup analysis with mechanism injury revealed that Road Traffic Accident was the commonest mechanism of injury in Ethiopia 21% (95% confidence Interval(IC), 15 to 30 followed by Assault 18% (95% confidence interval, 5 to 48).**Conclusion:** The review revealed that the prevalence of Traumatic Brain Injury is very high. The policymakers and stakeholders should work on regulatory laws on transportation, mode of transport, types of vehicles, driving license, and pre-hospital emergency medical care system is highly in demand to reduce the burden of Traumatic Brain Injury in Ethiopia. **Keywords:** Head injury, Road Traffic Accident, Assault, Ethiopia | 2 |
|  **INTRODUCTION**  |  |
| Rationale  | 3 | Some cross-sectional epidemiological studies are conducted in different regions of Ethiopia. However, there is no national prevalence of Traumatic Brain Injury despite the demands of a body of evidence for health planners and policymakers. The aim of this systemic review is to provide current evidence on the epidemiology and national prevalence of Traumatic Brain Injury for different stakeholders for prevention and management strategies of Traumatic Brain Injury. | 3 |
| Objectives  | 4 | This systemic review and meta-analysis aimed to investigate the burden of Traumatic Brain Injury Ethiopian. | 6 |
|  **METHODS**  |  |
| Protocol and registration  | 5 | It was sent in Prospero and they are working on it |  |
| Eligibility criteria  | 6 | The review included all cross-sectional studies conducted to assess the magnitude of Traumatic Brain Injury and other cross-sectional studies conducted on pattern and outcomes of trauma that reports Traumatic Brain Injury as a secondary outcome were considered | 6 |
| Information sources  | 7 | A three steps search strategy was employed in this review. An initial search on PubMed/Medline, Science direct and African Online Journal was carried out followed by an analysis of the text words contained in Title/Abstract and indexed terms. A second search was undertaken by combining free text words and indexed terms with Boolean operators. The third search was conducted with the reference lists of all identified reports and articles for additional studies. Finally, the additional and grey literature search was conducted on Google scholars up to ten pages | 7 |
| Search  | 8 | The search strategy conducted in PubMed was presented as Search (((((("Ethiopia"[Title/Abstract] OR "Tigray"[Title/Abstract] OR "Amhara"[Title/Abstract] OR "SNNPR"[Title/Abstract] OR "Oromia"[Title/Abstract] OR "Addis Ababa"[Title/Abstract]))) AND (("cross sectional"[Title/Abstract] OR "observational"[Title/Abstract] OR " retrospective"[Title/Abstract]))) AND (("prevalance"[Title/Abstract] OR "pattern"[Title/Abstract] OR "epedemiology"[Title/Abstract] OR "mortality"[Title/Abstract]))) AND (("trauma"[Title/Abstract] OR "injury"[Title/Abstract]))) AND (("head injury"[Title/Abstract] OR " traumatic brain injury"[Title/Abstract] OR " head[Title/Abstract] AND neck injury"[Title/Abstract])) | 7 |
| Study selection  | 9 | Studies were selected independently with two Authors with population, phenomena of interest, context, and design | 7 |
| Data collection process  | 10 | The data from each individual study were extracted by SM and BJ independently with Microsoft excel format and imported for analysis in R software version 3.6.1 | 8 |
| Data items  | 11 | No special data items to be described and defined as it has been described in the methodology.  |  |
| Risk of bias inindividual studies  | 12 | Not applicable |  |
| Summary measures  | 13 | The main summary measures were proportion with 95% confidence interval | 10 |
| Synthesis of results  | 14 | The synthesis of results was carried out in R software version 3.6.1. and both meta and metafor packages were employed. The Heterogeneity among the included studies was checked with forest plot, χ2 test, I2 test, the p-values. Rank correlation and linear regression were used to confirm publication bias | 10 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Section/topic**  | **#** | **Checklist item**  | **Reported on page #**  |
| Risk of bias across studies  | 15 | We tried to assess publication bias with a funnel plot and we did not see that much publication bias as shown with Egger's test | 12 |
| Additional analyses  | 16 | Subgroup analysis was done to find out the source of heterogeneity | 12 |
|  **RESULTS**  |  |
| Study selection  | 17 | A total of 198 articles were identified from different databases. Twenty-one articles were selected for evaluation after the successive screening. Twelve Articles with 14,017 participants reporting the prevalence of head injury as a primary outcome and secondary outcome were included and the rest were excluded with reasons.  | 12 |
| Study characteristics  | 18 | The included studies were published from 2011 to 2019 with sample size ranged from171 to 4153. | 12 |
| Risk of bias within studies  | 19 | Not applicable |  |
| Results of individual studies  | 20 |  The results of individual studies were narrated  | 13 |
| Synthesis of results  | 21 | The synthesis of results was carried out with R software version 3.6.1. , meta and metafor function | 13 |
| Risk of bias across studies  | 22 | Risk of bias was tried to be addressed with funnel plot but we did not present the graph | 14 |
| Additional analysis  | 23 |  Moderator and regression analysis was conducted  | 14 |
|  **DISCUSSION**  |  |
| Summary of evidence  | 24 | The pooled prevalence of Traumatic Brain Injury in Ethiopia was 20% (95% confidence interval, 11 to 32, 12). Subgroup analysis with mechanism injury revealed that Road Traffic Accident was the commonest mechanism of injury in Ethiopia 21% (95% confidence Interval(IC), 15 to 30 followed by Assault 18% (95% confidence interval, 5 to 48 | 15 |
| Limitations  | 25 | The review incorporated a few studies assessing the prevalence of Traumatic Brain Injury. Besides, there were only a small number of studies in some regions and there were no studies at all in some regions assessing the prevalence of traumatic brain injury | 16 |
| Conclusions  | 26 | The review revealed that the prevalence of Traumatic Brain Injury is very high. The policymakers and stakeholders should work on regulatory laws on transportation, mode of transport, types of vehicles, driving license, and pre-hospital emergency medical care system is highly in demand to reduce the burden of Traumatic Brain Injury in Ethiopia | 16 |
|  **FUNDING**  |  |
| Funding  | 27 |  Authors own resources | 17 |

Table 2: Description of excluded studies

|  |  |  |  |
| --- | --- | --- | --- |
| Author | Year  | Sample size | Reasons for exclusion  |
| Maher et al.(18) | 2018 | – | The burden of head injury in global perspective |
| Fasika et al.(19) | 2017 | 750 | Source population unspecified and proportion is undeterminable |
| Jessica et al.(27) | 2017 | 280 | Traumatic brain injury in Sub-Saharan Africa |
| M. Landes et al.(6) | 2017 | 204 | Source population unspecified and proportion is undeterminable |
| Bock-Oruma et al.(29) | 2016 | 88 | Epidemiology and outcomes of head injury in Nigeria |
| Isabel et al.(18) | 2014 | 52 | Source population unspecified and proportion is undeterminable |
| Qureshi et al.(30) | 2013 | 841 | Head injury triage in a sub-Saharan African urban population |
| Okoth et al. | 2012 | 209 | Epidemiology and outcomes of head injury in Kenya |
| Azeem et al.(28) | 2001 | – | Traumatic brain injury from the Egyptian perspective |