Citation

Ibrahim Gwarzo, Jennifer Horney, Margaret Foster. Epidemiologic burden of traumatic brain injury in the united states: a systematic review. PROSPERO 2019 CRD42019117761 Available from:
https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42019117761

Review question

What is the epidemiologic burden of Traumatic Brain Injury in the United States? [Epidemiology involves incidence, mortality rates, and prevalence of Traumatic Brain Injuries].

Searches

A search will be conducted in the electronic database of PubMed. Only studies published from the last 20 years would be considered (1998 - 2018). Only studies published in English will be considered.

Types of study to be included

All observational studies (cross-sectional, cohort, case-control) that primarily involve the epidemiology of TBI. Reviews, duplications, and commentaries are excluded.

Condition or domain being studied

Traumatic Brain Injury (TBI) is defined by the United States Centers for Disease Control (CDC) as "as a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or penetrating head injury. Everyone is at risk for a TBI, especially children and older adults".

It is a leading cause of death and disability among young adults and the elderly. Leading causes of TBI include motor vehicle accidents, accidental falls, and physical sports.

TBI is listed as a contributing factor in a third of all injury-related deaths, and, of all types of injuries, TBI is more likely to lead to a long term disability. Adults aged above 65 have the highest rate of TBI hospitalizations and death. Survivors of TBI have an increased risk of diseases such as stroke, epilepsy, depression, and other major cardiovascular disorders

Participants/population

The study population is that of United States of America, studies must be predominantly about the epidemiology of TBI in the US. They should report either a cumulative incidence (incidence proportion), prevalence, mortality, or case fatality of TBI for a U S- based population (hospital based, local, state, or nationwide). There is no age, gender, race, occupational, or ethnicity restriction. Studies must have been published in English language between 1998 to 2018, with full text available to be considered.

Intervention(s), exposure(s)

Not applicable as this is a prevalence study.

Comparator(s)/control

Not applicable as this is a prevalence study.

Context

The setting is that of the whole United States, there is no regional, or demographic restriction.

Main outcome(s)

The main outcome is a TBI as defined by the United States Centers for Disease Control (CDC), "a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head, or penetrating head injury"

Additional outcome(s)
Not applicable

Data extraction (selection and coding)

Relevant search technique will be implemented on the electronic database identified. This will be done by two reviewers, selected articles will be transferred to an electronic software (Rayyan QCRI). After relevant articles are uploaded into the software, two screening steps will be implemented by two independent reviewers aimed at ensuring the selected articles meet the inclusion criteria.

The first screening step involve two reviewers independently reviewing the titles and abstracts of the selected articles against the inclusion and exclusion criterion. While the second screening step, will involve the two independent reviewers reviewing the whole article. Subsequently, the final selected articles from the two reviewers will be cross-checked against each other and discrepancies will be resolved by a third independent reviewer's decision.

Data will be extracted from selected articles, these data include 1. source population, 2. study period, 3. study group size, 4. case ascertainment method, 5. incidence, 6. age distribution, and 7. gender distribution.

Risk of bias (quality) assessment

Selected studies will be evaluated for methodological quality. The focus will be on study design, case definition, case ascertainment, and epidemiological description. The following five elements of the STROBE checklist will be used as the basis of the methodological assessment, they include 1. study design, 2. setting, 3. participants, 4. data sources/measurement and 5. study sample size.

Two independent reviewers will undertake the study quality assessment. The final results of the evaluation will be a harmonized assessment of the two reviewers conclusions. Discrepancies will be resolved by the decision of a third reviewer. The results will be provided in a table with a column signifying completeness or otherwise of the 5 elements of the STROBE checklist.

Strategy for data synthesis

Aggregate data will be extracted from selected articles, these data include 1. source population, 2. study period, 3. study group size, 4. case ascertainment method, 5. incidence, 6. age distribution, and 7. gender distribution.

A table with list of selected studies and columns represented the above extracted data will be provided.

For the meta-analysis component, random effects model would be used to calculate the pooled incidence of TBI from selected studies. Heterogeneity index signifying between-study variation would be estimated and expressed with $?^2$, while the proportions of total variation of the selected studies will be presented with I^2.

Analysis of subgroups or subsets
Not applicable

Contact details for further information
Ibrahim Gwarzo

gwarzo@sph.tamhsc.edu

Organisational affiliation of the review
Texas A&M University, School of Public Health
https://sph.tamhsc.edu/

Review team members and their organisational affiliations
Mr Ibrahim Gwarzo. Texas A&M University, School of Public Health
Professor Jennifer Horney. University of Delaware School of Public Health
Professor Margaret Foster. Librarian

Type and method of review
Epidemiologic, Meta-analysis, Systematic review

Anticipated or actual start date
03 December 2018

Anticipated completion date
23 August 2019

Funding sources/sponsors
None

Conflicts of interest

Language
English

Country
United States of America

Stage of review
Review Ongoing

Subject index terms status
Subject indexing assigned by CRD

Subject index terms
Brain Injuries; Brain Injuries, Traumatic; Humans; United States

Date of registration in PROSPERO
23 April 2019

Date of first submission
22 March 2019

Details of any existing review of the same topic by the same authors

Stage of review at time of this submission

Stage	Started	Completed
Preliminary searches	No	No
Piloting of the study selection process	Yes	No
Formal screening of search results against eligibility criteria	No	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

The record owner confirms that the information they have supplied for this submission is accurate and complete and they understand that deliberate provision of inaccurate information or omission of data may be construed as scientific misconduct.

The record owner confirms that they will update the status of the review when it is completed and will add publication details in due course.

Versions

23 April 2019