

National Health Care for the
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Traumatic brain injury among the homeless

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Definition of TBI

An alteration in brain function, or other evidence of brain pathology, caused by an external force.

American Congress of Rehabilitation Medicine, 2010
Brain Injury Association of America

Acquired Brain Injury

TRAUMATIC

- Open
- Closed



NON-TRAUMATIC

- Anoxia
- Aneurysms
- Brain Tumors
- Encephalitis
- Meningitis
- Metabolic Encephalopathy
- Stroke with Cognitive Disabilities

Extent of TBI

Estimated global prevalence, 2% of population

TBI is more common than breast cancer, spinal cord injury,
HIV/AIDS and multiple sclerosis combined

Lifetime prevalence up to one third of population

Common among homeless populations

Clinical Sequelae

- TBI survivors like “snowflakes”: no two alike
- Highly variable presentation depending on area of the brain affected
- Frontal lobe damage can affect social behavior
- Occipital lobe damage may affect vision
- Women and men share many clinical outcomes but differ in others

Review of the Literature

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traumatic brain injur* Article Title, Abstract, Keywords

AND homeless Article Title, Abstract, Keywords

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Traumatic brain injury among people who are homeless: a systematic review

Topolovec-Vranic et al. 2012



Photo Source: <http://www.cbc.ca/news>

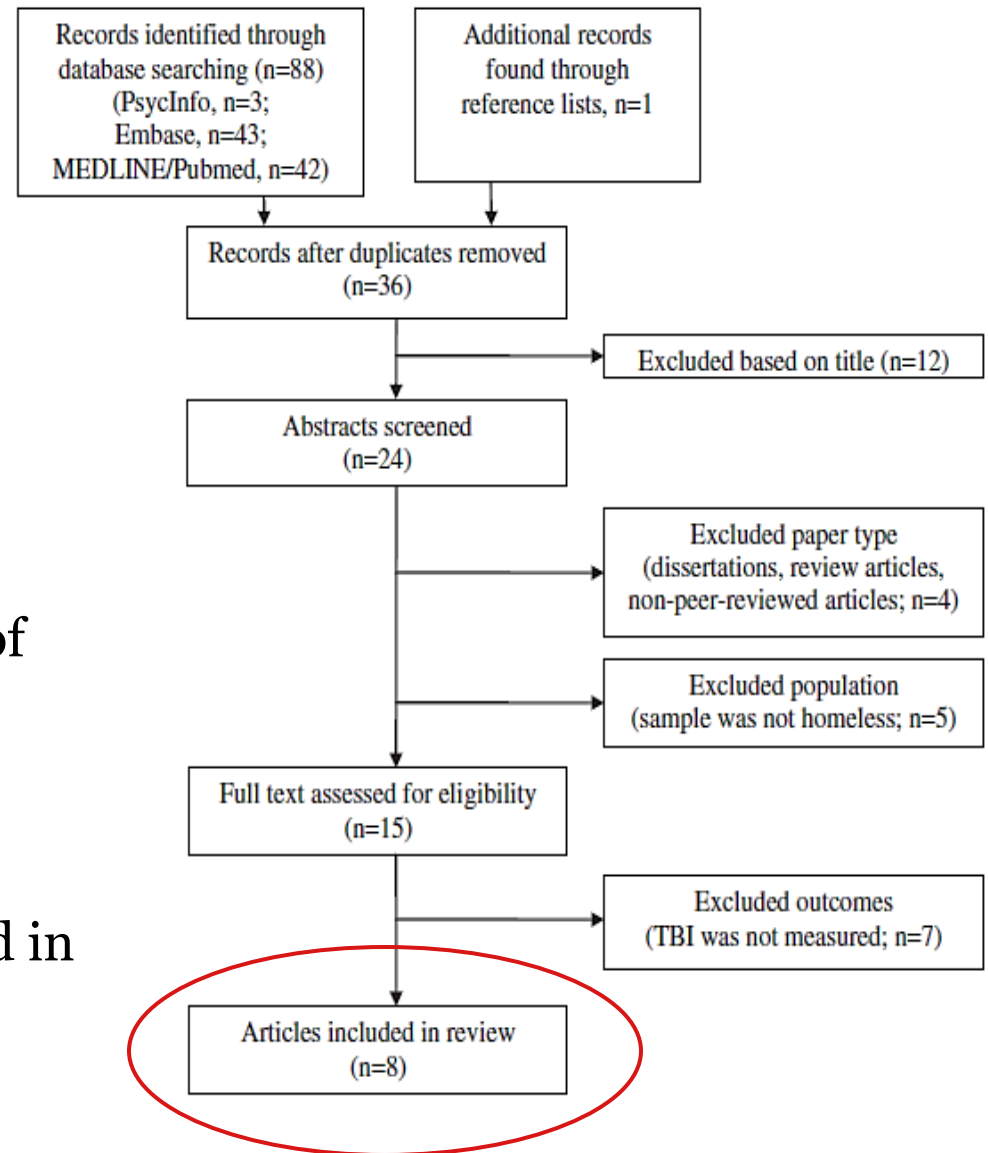
- Many people who are homeless or at risk of becoming homeless have a history of TBI
- No previous review of the literature on TBI and homelessness

METHODOLOGY

Two authors screened and reviewed for eligibility

Papers were excluded if

- the population studied was not comprised exclusively of homeless people
- the study examined solely non-TBI
- the study was not published in a peer-reviewed journal
- it was a review article



FINDINGS

Oddy et al. The prevalence of traumatic brain injury in the homeless community in a UK city. 2012.

Setting	11 homeless hostels and day center services in the UK (dry and wet hostels and day centers)
N	100 (75 men, 25 women)
Mean age (years)	32.7 (SD: 12.3)
% with TBI history	48
Screening Method	Self-report

Hux et al. Screening for traumatic brain injury. 2009.

Setting	Homeless shelter in a mid-west state (USA)
N	240 (34 men, 206 women)
Mean age (years)/	35.6
% with TBI history	20
Screening Method	HELPS screening tool

Hwang et al. The effect of traumatic brain injury on the health of homeless people. 2008.

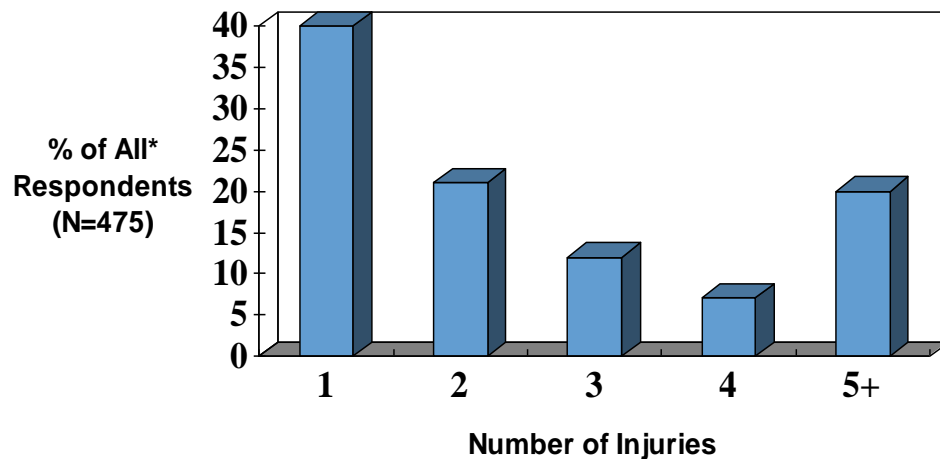
Setting	Shelters and meal programs in Toronto, Ontario (Canada)
N	904 (607 men, 297 women)
Mean age (years)/	37.4 (SD: 12.9)
% with TBI history	53
Screening Method	Self-report

Hwang et al. 2008

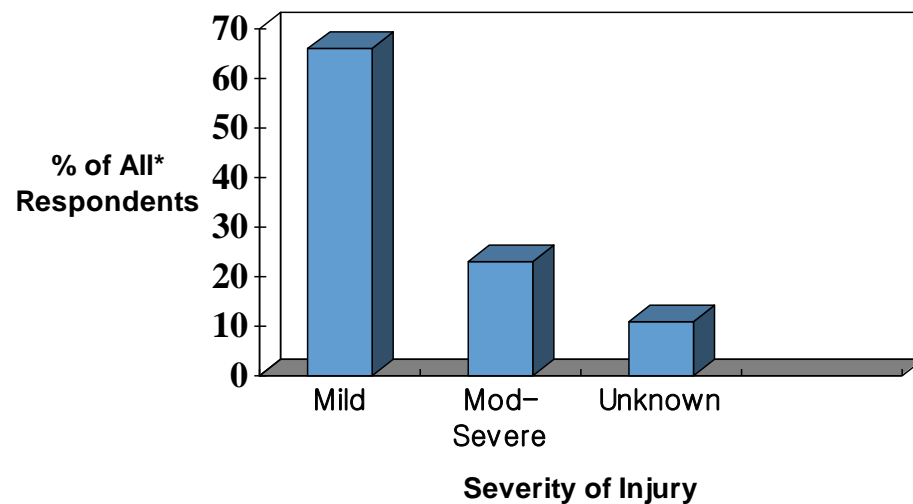
Have you ever had an injury to the head which knocked you out or at least left you dazed, confused, or disoriented?

Yes: 53%
(of 904 participants)

Number of Injuries over Lifetime



Severity of Worst TBI



People with a history of TBI compared to people without had significantly higher levels of...

- Seizures
- Mental problems
- Alcohol problems
- Drug abuse problems

Kim et al. An experience of management of homeless neurosurgical patients. 2007.

Setting	Neurosurgical department (Korea)
N	76 (71 men, 5 women)
Mean age (years)/	40
% with TBI history	--
Screening Method	Retrospective review of medical records and radiological films following admission to neurosurgical department

Solliday-McRoy et al. Neuropsychological functioning of homeless men. 2004.

Setting	Large homeless shelter in Milwaukee, Wisconsin (USA)
N	90 (90 men, 0 women)
Mean age (years)/	41 (SD: 9.06)
% with TBI history	48
Mean dur. homelessness (days)	87.7 (SD: 75.6)
Screening Method	Self-report

Gonzalez et al. Neuropsychological evaluation of higher functioning homeless persons: a comparison of an abbreviated test battery to the mini-mental state exam. 2001.

Setting	Clinic in Miami, Florida (USA) providing healthcare to homeless population
N	60 (36 men, 24 women)
Mean age (years)/	39.8 (SD: 11.4)
% with TBI history	38
Screening Method	Documented instance of concussion/loss of consciousness or self-report

Cotman & Sandman. Cognitive deficits and their remediation in the homeless. 1997.

Setting	Homeless residents of an 18 month residential program in Orange County, California (USA)
N	24 (13 men, 11 women)
Mean age (years)	30.6 (SD: 6.5)
% with TBI history	8
Screening Method	Self-report

Bremner et al. Cognitive function and duration of “rooflessness” in entrants to a hostel for homeless men. 1996.

Setting	Hostel in London (UK)
N	62 (62 men, 0 women)
Mean age (years)	--
Median dur. Last visit (days)	42
% with TBI history	46
Screening Method	Self-report

DISCUSSION

- Overall, very few articles about this topic
- A history of TBI in the homeless population may put them at risk for further injury
- Results align with earlier studies that found higher prevalence of TBI in men than women



STUDY LIMITATIONS

Population

- Small sample sizes
- Most participants were middle-aged men
 - *Very few female participants*
 - *No youth participants*
- Little consideration of ethnicity (only in 2 studies)

Data Collection

- Duration of homelessness inconsistently documented
- Most data self-reported
 - Medical histories only reviewed in 2 studies
- No longitudinal studies
- Severity of TBI inconsistently documented

CONCLUSIONS

- The homeless population has a disproportionately high risk of TBI
- More in-depth and comprehensive studies are needed
- Strategies to best address the effects of TBI need to be researched in order to reduce the prevalence of homelessness

Traumatic brain injury and cognitive impairment in men who are homeless

Andersen et al, 2014

Thirty-four participants: n=12 with a positive screen and n=22 with a negative screen for TBI.

Both groups performed below norms in all cognitive domains as measured by the RBANS. **Those with a positive screen for TBI performed significantly worse on attention tasks than those with a negative screen.**

TAKE HOME MESSAGE: An improved awareness of TBI and cognitive dysfunction by service providers, and routine TBI screening, could improve treatment and service delivery for this population.

Traumatic brain injury among men in an urban homeless shelter: Observational study of rates and mechanisms of injury

Topolovec-Vranic J et al. 2014

- **111** participants recruited from an urban men's shelter in Toronto, Canada
- Brain Injury Screening Questionnaire used
- **50%** screened positive for TBI
- **87%** reported first injury prior to homelessness
- **66%** reported at least 1 TBI due to assault
- TBI associated with lifetime history of arrest, mental illness, parental history of substance abuse

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Characteristics of traumatic brain injuries sustained among veterans seeking homeless services

Barnes et al. 2015

- 229 veterans who sustained a TBI seeking homeless services
- 83% of participants sustained at least one TBI prior to their first episode of homelessness
- assaults, transportation-related accidents, and falls were the most common causes of TBI
- 43% sustained at least one brain injury following their first episode of homelessness.
- Median lifetime number of TBIs = 3
- Severity of TBIs was similar among veterans who sustained injuries before or after their first incident of homelessness

Head Injury and Mortality in the Homeless

McMillan et al. 2015

- Prevalence of hospitalized head injury among homeless in Glasgow
- 1590 homeless identified using local registries of persons who are homeless: hostels, family practices
- Homeless were 5.4 times more likely than general population to be have head injury
- Homeless Persons with head injury 4.5 times more at risk for mortality than without head injury

Neurocognitive impairment in a large sample of homeless adults with mental illness.

Stergiopoulos et al., 2015

- 1500 homeless adults with mental illness enrolled in At Home Chez Soi study, Canada
- Neuropsychological measures used
- Nearly half had experienced severe TBI
- 72% with cognitive impairment
e.g. deficits in processing speed (48%), verbal learning (71%) and recall (67%), and executive functioning (38%).

Screening Tools

Instruments to Identify Traumatic Brain Injuries

Examples

- Ohio State University TBI Identification Method
- HELPS Brain Injury Screening Tool
- Brain Injury Screening Questionnaire

HELPS BRAIN INJURY SCREENING TOOL

Consumer Information: _____

Agency/Screeener's Information: _____

H Have you ever Hit your Head or been Hit on the Head? Yes No

Note: Prompt client to think about all incidents that may have occurred at any age, even those that did not seem serious: vehicle accidents, falls, assault, abuse, sports, etc. Screen for domestic violence and child abuse, and also for service related injuries. A TBI can also occur from violent shaking of the head, such as being shaken as a baby or child.

E Were you ever seen in the Emergency room, hospital, or by a doctor because of an injury to your head? Yes No

Note: Many people are seen for treatment. However, there are those who cannot afford treatment, or who do not think they require medical attention.

L Did you ever Lose consciousness or experience a period of being dazed and confused because of an injury to your head? Yes No

Note: People with TBI may not lose consciousness but experience an "alteration of consciousness." This may include feeling dazed, confused, or disoriented at the time of the injury, or being unable to remember the events surrounding the injury.

P Do you experience any of these Problems in your daily life since you hit your head? Yes No

Note: Ask your client if s/he experiences any of the following problems, and ask when the problem presented. You are looking for a combination of two or more problems that were not present prior to the injury.

- | | |
|---|--|
| <input type="checkbox"/> headaches | <input type="checkbox"/> difficulty reading, writing, calculating |
| <input type="checkbox"/> dizziness | <input type="checkbox"/> poor problem solving |
| <input type="checkbox"/> anxiety | <input type="checkbox"/> difficulty performing your job/school work |
| <input type="checkbox"/> depression | <input type="checkbox"/> change in relationships with others |
| <input type="checkbox"/> difficulty concentrating | <input type="checkbox"/> poor judgment (being fired from job, arrests, fights) |
| <input type="checkbox"/> difficulty remembering | |

S Any significant Sicknesses? Yes No

Note: Traumatic brain injury implies a physical blow to the head, but acquired brain injury may also be caused by medical conditions, such as: brain tumor, meningitis, West Nile virus, stroke, seizures. Also screen for instances of oxygen deprivation such as following a heart attack, carbon monoxide poisoning, near drowning, or near suffocation.

Scoring the HELPS Screening Tool

A HELPS screening is considered positive for a *possible* TBI when the following 3 items are identified:

- 1.) An event that could have caused a brain injury (yes to H, E or S), **and**
- 2.) A period of loss of consciousness or altered consciousness after the injury or another indication that the injury was severe (yes to L or E), **and**
- 3.) The presence of two or more chronic problems listed under P that were not present before the injury.

Note:

- A positive screening is **not sufficient to diagnose TBI** as the reason for current symptoms and difficulties - other possible causes may need to be ruled out
- **Some individuals could present exceptions** to the screening results, such as people who do have TBI-related problems but answered "no" to some questions
- Consider positive responses within the context of the person's self-report and documentation of altered behavioral and/or cognitive functioning

Brain Injury Screening Questionnaire (BISQ)

The BISQ is structured to review types of situations in which a brain injury can occur, such as falling down stairs

If a blow to the head is experienced, respondents are asked to recall whether they felt dazed and confused or a experienced loss of consciousness.

If **yes**, they complete a self-report on 100 symptoms commonly found after TBI.

For people without a blow to the head and associated changes in mental state, the BISQ takes about 5 minutes to complete. It can take much longer if person has been injured

Indication of persistent symptoms indicative of whether a person screens positive or negative

The BISQ is currently available in a paper-and-pencil version, which is mailed to Mount Sinai Hospital (New York) for electronic scanning and computer scoring.

A report is generated and mailed back, indicating the probability of having experienced a TBI. A second version – web-based, password-protected – provides a report directly to the user.

Contact Dr. Wayne Gordon wayne.gordon@mssm.edu for details.

Neuropsychological Evaluation

- Typically involves many hours of testing
- Repeatable Battery for Assessment of Cognition (RBANS) is a short test

Screening tools

- Latrobe Communication Questionnaire (Douglas)
- Pragmatic Communication Scale (Erlich & Sipes)
- Pragmatic Rating Scale (MacLennan et al.)

Programs and Services for people with TBI at risk for homelessness

Example: ShelterCare Uhlhorn Program

<http://www.sheltercare.org/what-we-do/brain-injury-services/>

Low cost programs for people with brain injury

- Transitional program providing basic skills training from a broad menu of options.
- Counselling, advocacy, health and hygiene assistance, skill building and training for independence.
- Occupational therapist facilitates client goals: which relate to both person and environment/ assistive technology
- Contact: Mr. Ken Collins: brain injury survivor

- Skill building classes and support groups: money management, medication management, anger management, memory skills development, meal planning and preparation, budgeting, and community orientation.
- Program participants use the program activities to build skills, increase their independence and graduate to a more independent community living situation.
- Providing residential and support services for survivors of acquired brain injury at Uhlhorn and ShelterCare's River Kourt Apartments, often the next step in the recovery process
- Nationally recognized BI programs and low cost

Longer-term Residential Recovery Option

- Longer term residence option for low income survivors of brain injury,
- Less intensive program regimen yet over a longer period of time
- Life-long support may be needed to remain independent in the community.
- Program activities include training classes, support groups and therapeutic outings.

Home/Device Adaptations for Persons with Brain Injury

- Digital voice recorder: a device used to record information "in the moment" for later recall.
- Programmable watch: a wristwatch used for alarms/reminders to help recall important activities/events.
- Medication boxes: used to organize medications by day and time
- Motion lights that adjust to outdoor/natural lighting (to avoid issues with glare)

Knowledge Transfer: Research Based Theatre

Based on focus groups with survivors of brain injury, family members and health care providers

Shows impact of TBI and best practices for rehabilitation

AFTER THE CRASH performed by the Ruckus Ensemble



Research Support



St. Michael's
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Thank you!

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