Head Injuries and The Homeless Population

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Objectives

- Overview of evidence and literature about head injury among homeless persons
- Anatomy/Physiology of head trauma, clinical screening applications to lay workers, post-discharge needs
- Colorado DHS activities to support homeless in our communities, TBI services
- Reflective/application activities
Literature Review

General homelessness epidemiology

Head injuries among homeless adults
• Rota-Bartelink. Homeless Adults Living with Acquired Brain Injuries. *Parity*. 2010;23(1):
Head injuries among homeless adults

- Hwang et al. Traumatic Brain Injury in the Homeless Population: A Toronto Study
Head injuries among homeless youth

Our paper!
• Number of unaccompanied runaway/homeless youth in US = unknown
• Violence is a considerable risk when living on the streets
• Lifetime prevalence: 8-53%, study limitations
• Risk covariates: trauma history, violence, sexual risk-taking, cognitive deficits, substance use
Study Purpose

• Prevalence of TBI among adolescents in a population-based study

• Examine covariates of those with or without history of TBI

• Timing of TBI in relation to first homeless episode
METHODS

- Wilder Homelessness Survey
  - Wilder Research, St. Paul MN, population survey, one night in October, q 3 years

- Sample: Unaccompanied youth, ages 11-28
  - 2006 & 2009, N = 2732

- Outcome variable: self-reported history of TBI
  - “Have you ever been hit in the head so hard that you saw stars, or were knocked unconscious...”
  - “After your head injury, did you start having problems with headaches, memory, concentration, ...”

- Exposures of interest: sociodemographic characteristics, mental health history, substance use, exposure to violence, ADLs

- Data analyses: univariates by group, Poisson regression (prevalence ratios), sensitivity analysis
RESULTS

- Sociodemographic characteristics
  - Mean age: 21.8 years
  - 63% female; 38% white, 35% African American
  - 10% sexual minority (gay/lesbian, bisexual, or unsure)
  - 40% had less education than age-expected; 37% history of special education services or IEP
  - 73% were unemployed; 6% employed full-time
  - 32% foster care history; 29% had been in juvenile justice
- Duration of current homelessness:
  - 51% less than 6 mths
  - 11% 6-12 mths
  - 25% 1-3 yrs
  - 13% more than 3 yrs
Key findings:

- 43% of respondents reported a history of TBI
- Mean age of first injury was 15 years
- More common among male and those identifying as bisexual
- 40% had less education than age-expected; 37% history of special education services or IEP
- 51% sustained first injury prior to first homelessness; 10% reported it the same year as first homeless episode
- Those with TBI became homeless at a younger age
- Statistically significant increased PRs for: all substance use risk behaviors, mental health diagnoses (34-77% greater), suicidality, history of trauma, and difficulties with ADLs
# RESULTS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>History of TBI (%)</th>
<th>No history of TBI (%)</th>
<th>Prev Ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male gender (female, ref)</td>
<td>45.4</td>
<td>29.3</td>
<td>1.47</td>
<td>1.31-1.65</td>
</tr>
<tr>
<td>Black, African American (white, ref)</td>
<td>29.4</td>
<td>39.5</td>
<td>0.73</td>
<td>0.63-0.84</td>
</tr>
<tr>
<td>Bisexual (straight, ref)</td>
<td>7.0</td>
<td>4.7</td>
<td>1.26</td>
<td>1.00-1.59</td>
</tr>
<tr>
<td>Education, higher than expected for age (lower, ref)</td>
<td>20.3</td>
<td>23.5</td>
<td>0.84</td>
<td>0.72-0.98</td>
</tr>
<tr>
<td>History of IEP (no, ref)</td>
<td>44.2</td>
<td>31.7</td>
<td>1.35</td>
<td>1.20-1.52</td>
</tr>
<tr>
<td>History of foster care (no, ref)</td>
<td>37.5</td>
<td>27.6</td>
<td>1.29</td>
<td>1.14-1.45</td>
</tr>
<tr>
<td>History of juv corrections (no, ref)</td>
<td>37.1</td>
<td>22.9</td>
<td>1.45</td>
<td>1.29-1.63</td>
</tr>
<tr>
<td>History of military service (no, ref)</td>
<td>4.0</td>
<td>1.0</td>
<td>1.80</td>
<td>1.34-2.42</td>
</tr>
<tr>
<td>Age of first homelessness</td>
<td>16.2 (sd 5.5)</td>
<td>17.4 (sd 5.3)</td>
<td>0.98</td>
<td>0.97-0.99</td>
</tr>
<tr>
<td>Characteristic</td>
<td>History of TBI (%)</td>
<td>No history of TBI (%)</td>
<td>Prev Ratio</td>
<td>95% CI</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>--------------------</td>
<td>-----------------------</td>
<td>------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Number of MH diagnoses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>39.9</td>
<td>67.0</td>
<td>REF</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>19.3</td>
<td>15.8</td>
<td>1.51</td>
<td>1.28-1.78</td>
</tr>
<tr>
<td>2</td>
<td>18.1</td>
<td>9.6</td>
<td>1.84</td>
<td>1.56-2.19</td>
</tr>
<tr>
<td>3 or more</td>
<td>22.8</td>
<td>7.6</td>
<td>2.10</td>
<td>1.79-2.47</td>
</tr>
<tr>
<td>Lifetime suicidal ideation</td>
<td>48.4</td>
<td>22.4</td>
<td>1.83</td>
<td>1.62-2.06</td>
</tr>
<tr>
<td>Lifetime suicide attempt</td>
<td>69.1</td>
<td>60.3</td>
<td>1.22</td>
<td>1.01-1.47</td>
</tr>
<tr>
<td>(among those saying “yes” to above)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Childhood sexual abuse</td>
<td>38.9</td>
<td>23.4</td>
<td>1.74</td>
<td>1.53-1.98</td>
</tr>
<tr>
<td>Childhood physical abuse</td>
<td>57.2</td>
<td>32.7</td>
<td>1.80</td>
<td>1.59-2.02</td>
</tr>
<tr>
<td>Partner violence, past 12 mths</td>
<td>36.1</td>
<td>24.9</td>
<td>1.54</td>
<td>1.35-1.75</td>
</tr>
<tr>
<td>PA/SA during homeless episode</td>
<td>32.3</td>
<td>13.0</td>
<td>1.88</td>
<td>1.66-2.14</td>
</tr>
<tr>
<td>Survival sex during homelessness</td>
<td>21.7</td>
<td>11.0</td>
<td>1.51</td>
<td>1.31-1.74</td>
</tr>
</tbody>
</table>
Timing of TBI and 1st Homelessness Episode

Note. Supplemental table is available examining risk stratified in this manner. (LGBT youth)
LIMITATIONS/STRENGTHS

- Limitations
  - Cross-sectional analysis
    - Slight possibility of repeated surveys
    - [Conducted sensitivity analysis]
  - Self-report, recall bias
  - Dependent variable based on single item
    - [This item was the same as others in systematic review]
- Strengths
  - First analysis of TBI among runaway/homeless youth
  - Sampling captured a variety of settings, including street youth
  - Largest homeless sample to date; large proportion of females
  - Population estimates
CONCLUSIONS

**Research implications**

- Validate self-report items for TBI
  - Clinical validation
- Corroborate findings across geographic locales
- Investigate timing of TBI and homelessness

**Clinical implications**

- Need for effective screening protocols for identifying TBI among homeless youth
- Services, such as patient-centered care for youth with TBI
- Education about TBI for providers who work with homeless youth
1. In your state/agency/organization, do the data exist to track the epidemiology of head injury among the homeless population? 

    Or...

1. How are the homeless enumerated in your state/communities?

    *1 minute to share, switch at 30 seconds...GO!*
Identifying TBI Needs in a Non-clinical Setting

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Anatomy

- Skull: box with one opening
- Contents:
  - Brain
  - Spinal Fluid
  - Blood in blood vessels
Mechanism of Injury

• Brain is not fixed in place
  – Tear bridging veins, coup-contrecoup bruising

• Brain tissue has variable densities
  – Micro-tears at grey-white matter junction

• Brain has little connective tissue support for neurons
  – Axonal injury (mild → severe)
Severity of Injury

- Concussion (mild TBI)
- Subdural Hematoma
- Epidural Hematoma
- Diffuse Axonal Injury
Early Clinical Presentation

- Mild
  - Loss of consciousness
  - Amnesia
  - Confusion
  - Nausea/Vomiting
  - Headache
  - Vision changes
  - Drowsiness
  - Changes in temperament

- Moderate
  - Loss of consciousness
  - Amnesia
  - Confusion
  - Nausea/Vomiting
  - Headache
  - Vision changes
  - Drowsiness
  - Changes in temperament
Triage

Who Goes to the ED??

• Any of the following:
  – Bleeding from the head or any holes in the head
  – Loss of consciousness more than 5 seconds
  – Confusion lasting more than 5 minutes
  – Disorientation to person/place/time
  – Repetitive vomiting
  – Severe headache
  – Vision problems
  – Seizure activity
Mild-Moderate TBI Sequelae

- Persistent Post-concussive Symptoms
  - Somatic: physical symptoms
  - Cognitive: information processing difficulties
  - Emotional: changes in emotional responses
Post-Concussive Symptom Inventories

• Numerous available, validated inventories
  – Number of symptoms
  – Severity of symptoms
  – Type of symptoms
  – Change in symptoms relative to activity

• Which one should be used?
Post-Concussion Symptom Interview

- Includes cognitive, somatic and emotion sx

- Symptoms included mirror:
  - ICD-10 post-concussion syndrome criteria
  - DSM-IV post-concussional disorder criteria

- Disadvantages:
  - Not a graded scale
  - Interview rather than self-report format
Rivermead Post-Concussion Symptom Questionnaire


• Includes cognitive, somatic and emotion sx

• Symptoms are rated *compared to usual levels* (0-4)

• Disadvantages:
  – Not as thoroughly validated as other measures
  – No normative values available
Why measure PCS at all?

- Guide appropriate follow-up:
  - 1° somatic complaints → neurologist/physiatrist
  - 1° cognitive complaints → OT/neuropsychologist
  - 1° emotional complaints → (neuro)psychologist
Why measure PCS at all?

• Raise awareness of co-morbid conditions
  – PCS are non-specific
    • ↓ concentration, short attention span, difficulty thinking
    • Sadness, sleep disturbance, feeling tired, trouble concentrating

• Avoid inappropriate diagnostic labels
Post-discharge Needs for TBI

• Healthcare system navigation

• Symptom management
  – Sleep hygiene
  – Pain control
  – Nausea

• Employment support
  – Avoidance of exacerbating activities
  – Increased time to complete tasks
  – New skill training
Pair and Share Activity

• In the population your agency serves, what particular barriers to providing recovery support do you encounter most frequently?

1 minute each to share...GO!
What’s happening on the front lines?
Support for Homeless Persons Living with Head Injury

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Colorado Department of Human Services
Office of Behavioral Health
Office of Behavioral Health

• Is the federally designated State Mental Health Authority and the State Substance Abuse Authority for the purposes of administering federal mental health and substance abuse block grant funds.

• Is responsible for policy development, service provision and coordination, program monitoring and evaluation, and administrative oversight for the public behavioral health system.

• Funds, supports, and monitors numerous mental health and substance abuse community programs and providers.

• Operates the Colorado Mental Health Institutes at Fort Logan and Pueblo.
OBH Initiatives for Brain Injury and Homelessness

• Cooperative Agreement to Benefit Homeless Individuals (CABHI)

• Assertive Community Treatment (ACT)

• Individual Placement and Support Supported Employment (IPS)
CABHI

• CABHI provides infrastructure development and services for individuals who are chronically homeless, with an emphasis on Veterans and individuals with serious mental illness and co-occurring substance use disorders as well as co-morbid cognitive disorders resulting from trauma and traumatic brain injuries.

• CABHI is currently provided at AspenPointe, Colorado Coalition for the Homeless, Colorado Disability Benefits Support Program, Mind Springs Health, and Peak Research.
CABHI Implementation

• CABHI utilizes a variety of evidence based practices, including Critical Time Intervention, Housing First, Motivational Interviewing, Trauma Informed Care, Integrated Dual Disorder Treatment, Assertive Community Treatment, and Supported Employment.

• CABHI also uses linkages with SSI/SSDI Outreach, Access, and Recovery (SOAR), to provide benefits acquisition services, and with the Brain Injury Alliance of Colorado, to provide expert consultation.
ACT

• ACT is a service delivery model designed to support recovery through community treatment and rehabilitation.

• ACT is effective with serious mental illness as well as with co-occurring disorders, e.g., mental illness and substance use disorders or brain injuries.

• ACT is currently provided at all 17 Colorado Community Mental Health Centers.
ACT Implementation

- A multidisciplinary team approach
- Small, shared caseloads
- Flexible and frequent community based services
- Time unlimited services
- Assistance to help consumers live successfully in the community
- Crisis management to minimize higher levels of care
IPS

• IPS is a vocational service model designed to assist individuals with serious mental illness obtain and maintain part-time or full-time employment in the community (rather than in a specialized setting).

• IPS is effective with serious mental illness as well as with co-occurring disorders, e.g., mental illness and substance use disorders or brain injuries.

• IPS is currently provided at 10 of 17 Colorado Community Mental Health Centers.
IPS Implementation

- Competitive employment
- Zero exclusion eligibility criteria
- Integration of mental health and vocational services
- Attention to client preferences
- Personalized benefits counseling
- Rapid job search
- Systematic job development
- Time-unlimited services
Partners

Statewide Interagency Council on Homelessness:

- Department of Local Affairs – Division of Housing
- Department of the Human Services – Office of Behavioral Health
- Department of Labor and Employment
- Department of Corrections
- Department of Education
- Department of Health Care Policy and Financing
What are the some best practices happening in your communities and in your state to support those living with head injury in homeless shelters or precarious housing?
THANK YOU!

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