Cognitive Disabilities Colorado 2020

Appendix Index

Appendix Index

Abbreviated Summary

- **50 to 80 percent of people in the criminal justice system in the US have had a traumatic brain injury. In the general public, that number is less than five percent.**
- **TBI was consistently associated with poorer self-reported physical and mental health, higher suicidality and suicide risk, memory concerns, and increased health service use and criminal justice system involvement.**
- **Homelessness history was significantly associated with unemployment, lower disability income, more severe depressive, anxiety, posttraumatic stress disorder, and post-concussive symptoms, and lower performances on two of fifteen neurocognitive tests. In a multiple logistic regression model, current unemployment and substance use disorder remained significantly associated with lifetime homelessness**
- **A positive association between adverse childhood experiences and traumatic brain injury occurrence was identified.**

- **Prisoners who have had head injuries may also experience mental health problems such as severe depression and anxiety, substance use disorders, difficulty controlling anger, or suicidal thoughts and/or attempts.**
- **More than 10 million people are imprisoned worldwide, and the prevalence of all investigated mental disorders is higher in prisoners than in the general population.**
- **Re-offending and presence of psychiatric disorders are common in prisoners worldwide.**
- **Previous studies have found high rates of attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD) and intellectual disability (ID) within the criminal justice system (CJS).**
- **Data suggest individuals with substance use disorders (SUD) exhibit high rates of executive functioning (EF) impairment, and that EF level can predict treatment retention.**
- **Recent reports provide evidence for increased risk of substance use disorders (SUD) among patients with a history of early-life traumatic brain injury (TBI).**
- **"Unhappy triad" of brain injury, mental illness and addiction.**
- **More attention needs to be paid to the underlying socioeconomic disadvantages, persons with cognitive impairments face which may lead to homelessness.**
- **It is increasingly recognized that trauma victims, particularly Veterans, have co-occurring psychological and physical conditions that impact cognition, especially the domains of sustained attention and executive functioning.**
- **Prevalence rates of PTSD are higher in the prison population than in the community.**

APPENDIX 1-A: Brain Injury

Source	Date	Summary
The surprising connection between brain injuries and crime **Dr. Kim Gorgens is a full-time Clinical Professor in the Graduate School of Professional Psychology at the University of Denver.**	May 2019	**TedTalk** Here's a shocking statistic: 50 to 80 percent of people in the criminal justice system in the US have had a traumatic brain injury. In the general public, that number is less than five percent. Neuropsychologist Kim Gorgens shares her research into the connection between brain trauma and the behaviors that keep people in the revolving door of criminal justice -- and some ways to make the system more effective and safer for everyone.

Lancet Public Health. 2019 Dec 2. pii: S2468-2667(19)30225-7. doi: 10.1016/S2468-2667(19)30225-7. [Epub ahead of print]

Traumatic brain injury and homelessness: from prevalence to prevention.

Young JT[1], Hughes N[2].
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Dec. 2019

PubMed Link

Lancet Public Health. 2019 Dec 2. pii: S2468-2667(19)30188-4. doi: 10.1016/S2468-2667(19)30188-4. [Epub ahead of print]

Traumatic brain injury in homeless and marginally housed individuals: a systematic review and meta-analysis.

Stubbs JL[1], Thornton AE[2], Sevick JM[3], Silverberg ND[4], Barr AM[5], Honer WG[3], Panenka WJ[6].

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Dec. 2019

PubMed Link

Abstract

BACKGROUND:

Homelessness is a global public health concern, and traumatic brain injury (TBI) could represent an underappreciated factor in the health trajectories of homeless and marginally housed individuals. We aimed to evaluate the lifetime prevalence of TBI in this population, and to summarise findings on TBI incidence and the association between TBI and health-related or functioning-related outcomes.

METHODS:

For this systematic review and meta-analysis, we searched without date restrictions for original research studies in English that reported data on the prevalence or incidence of TBI, or the association between TBI and one or more health-related or function-related outcome measures. Studies were included if they had a group or clearly identifiable subgroup of individuals who were homeless, marginally housed, or seeking services

3 Department of Psychiatry, University of British Columbia, Vancouver, BC, Canada; British Columbia Mental Health and Substance Use Services Research Institute, Vancouver, BC, Canada. 4 Division of Physical Medicine and Rehabilitation, University of British Columbia, Vancouver, BC, Canada; Rehabilitation Research Program, Vancouver Coastal Health Research Institute, BC, Canada. 5 Department of Anesthesiology, Pharmacology & Therapeutics, University of British Columbia, Vancouver, BC, Canada; British Columbia Mental Health and Substance Use Services Research Institute, Vancouver, BC, Canada. 6 Department of Psychiatry, University of British Columbia, Vancouver, BC, Canada; British Columbia Mental Health and Substance Use Services Research Institute, Vancouver, BC, Canada; British Columbia Provincial Neuropsychiatry Program, Vancouver, BC, Canada.		for homeless people. With use of random-effects models, we calculated pooled estimates of the lifetime prevalence of any severity of TBI and the lifetime prevalence of moderate or severe TBI. We used metaregression to evaluate potential moderators of prevalence estimates and the leave-one-out method for sensitivity analyses. We then summarised findings from all studies that evaluated TBI incidence and the association between TBI and health-related or functioning-related outcomes. All statistical analyses were done using R version 3.5.1. The study is registered with PROSPERO, number CRD42019119678. **FINDINGS:** Of 463 potentially eligible studies identified by the search, 38 studies were included in the systematic review and 26 studies were included in the metaanalysis. The lifetime prevalence of any severity of TBI in homeless and marginally housed individuals (21 studies, n=11 417 individuals) was 53·4% (95% CI 47·6-59·1; I^2=97%) and the lifetime prevalence of moderate or severe TBI (12 studies, n=6302) was 24·9% (16·3-35·9; I^2=98%). The definition of TBI, the method used to ascertain TBI history, and the age of the sample significantly moderated estimated lifetime prevalence of any severity of TBI. TBI was consistently associated with poorer self-reported physical and mental health, higher suicidality and suicide risk, memory concerns, and increased health service use and criminal justice system involvement. **INTERPRETATION:** The lifetime prevalence of TBI is high among homeless and marginally housed individuals, and a history of TBI is associated with poorer health and

		general functioning. Health-care providers and public health officials should have an increased awareness of the burden of TBI in this population. Prospective and

		longitudinal studies are needed to better understand how the health of this population is affected by TBI. **FUNDING:** Canadian Institutes of Health Research.

Psychiatry Res. 2019 Jan;271:167-170. doi:

10.1016/j.psychres.2018.11.049. Epub 2018 Nov 20.

Neurocognition, psychiatric symptoms, and lifetime homelessness among veterans with a history of traumatic brain injury.

Twamley EW[1], Hays CC[2], Van Patten R[3], Seewald PM[4], Orff HJ[5], Depp CA[6], Olsen DC[7], Jak AJ[8].

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5

Jan. 2019

PubMed Link

Abstract

We retrospectively investigated archival clinical data, including correlates of lifetime homelessness, in 503 Veterans with a history of traumatic brain injuries (86.5% mild) who completed neuropsychological evaluations and passed performance validity tests.

The 471 never-homeless and 32 ever-homeless Veterans were compared on demographic factors, TBI severity, psychiatric diagnosis, subjective symptoms, and neuropsychological functioning.

Homelessness history was significantly associated with unemployment, lower disability income, more severe depressive, anxiety, posttraumatic stress disorder, and postconcussive symptoms, and lower performances on two of fifteen neurocognitive tests. In a multiple logistic regression model, current unemployment and substance use disorder remained significantly associated with lifetime homelessness.

Center of Excellence for Stress and Mental Health, VA San Diego Healthcare System, San Diego, CA 92161, USA; Department of Psychiatry, University of California, San Diego, La Jolla, CA 92093, USA; Research Service, VA San Diego Healthcare System, San Diego, CA 92161, USA. 6 Department of Psychiatry, University of California, San Diego, La Jolla, CA 92093, USA; Psychology Service, VA San Diego Healthcare System, San Diego, CA 92161, USA. 7 California School of Professional Psychology at Alliant International University, 10455 Pomerado Road, San Diego, CA 92131, USA. 8 Center of Excellence for Stress and Mental Health, VA San Diego Healthcare System, San Diego, CA 92161, USA; Department of Psychiatry, University of California, San Diego, La Jolla, CA 92093, USA; Psychology Service, VA San Diego Healthcare System, San Diego, CA 92161, USA.		

Disabil Rehabil. 2019 Jun;41(11):1360-1366. doi:
10.1080/09638288.2018.1424957. Epub 2018 Jan 12.

The association between adverse childhood experiences and adult traumatic brain injury/concussion: a scoping review.

Ma Z[1], Bayley MT[1], Perrier L[2], Dhir P[3,4], Dépatie L[4], Comper P[1], Ruttan L[1], Lay C[5], Munce SEP[1].

Author information

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2

June 2019

Abstract

BACKGROUND:

Adverse childhood experiences are significant risk factors for physical and mental illnesses in adulthood.

Traumatic brain injury/concussion is a challenging condition where pre-injury factors may affect recovery.

The association between childhood adversity and traumatic brain injury/concussion has not been previously reviewed.

b Gerstein Science Information Centre, University of Toronto , Toronto , Canada. 3 c Faculty of Medicine , University of Toronto , Toronto , Canada. 4 d The Hospital for Sick Children , Toronto , Canada. 5 e Centre for Headache, Women's College Hospital , Toronto , Canada.		The research question addressed is: What is known from the existing literature about the association between adverse childhood experiences and traumatic brain injury/concussion in adults? **METHODS:** All original studies of any type published in English since 2007 on adverse childhood experiences and traumatic brain injury/concussion outcomes were included. The literature search was conducted in multiple electronic databases. Arksey and O'Malley and Levac et al.'s scoping review frameworks were used. Two reviewers independently completed screening and data abstraction. **RESULTS:** The review yielded six observational studies. Included studies were limited to incarcerated or homeless samples, and individuals at high-risk of or with mental illnesses. Across studies, methods for childhood adversity and traumatic brain injury/concussion assessment were heterogeneous.

		DISCUSSION:

		A positive association between adverse childhood experiences and traumatic brain injury occurrence was identified. The review highlights the importance of screening and treatment of adverse childhood experiences. Future research should extend to the general population and implications on injury recovery. **Implications for rehabilitation Exposure to adverse childhood experiences is associated with increased risk of traumatic brain injury.** **Specific types of adverse childhood experiences associated with risk of traumatic brain injury include childhood physical abuse, psychological abuse, household member incarceration, and household member drug abuse.** **Clinicians and researchers should inquire about adverse childhood experiences in all people with traumatic brain injury as pre-injury health conditions can affect recovery.**

J Health Care Poor Underserved. 2017;28(3):1042-1049. doi: 10.1353/hpu.2017.0095.		**PubMed Link** **Abstract**

Head Trauma in Jail and Implications for Chronic Traumatic Encephalopathy in the United States: Case Report and Results of Injury Surveillance in NYC Jails. Siegler A, Rosner Z, MacDonald R, Ford E, Venters H.		Because there is no standard reporting of injuries in jails and prisons, the national burden of head trauma during incarceration is unclear. We report on a case of repeated head trauma in the New York City (NYC) jail system, data on the incidence of head trauma and mild traumatic brain injury (mTBI), and compare those findings with national estimates. The case report revealed 64 injurious events over two years, 44% resulting in a head injury and 25% resulting in emergency hospitalization. During the 42 months of this analysis, 10,286 incidents of head trauma occurred in the NYC jail system. Mild TBI occurred in 1,507 of these instances. The rate of head trauma and mTBI was 269.0 and 39.4 per 1,000 person-years, respectively. **The lack of reporting head trauma in correctional settings means that national prevalence estimates of these critical health outcomes miss the vulnerable cohort of incarcerated individuals.**

US Centers for Disease Control **Traumatic Brain Injury in Prisons and Jails: An Unrecognized Problem**		**CDC Handout** **What is known about TBI and related problems in prisons and jails?** **General:**

		• More than two million people currently reside in U.S. prisons and jails. • According to jail and prison studies, 25-87% of inmates report having experienced a head injury or TBI as compared to 8.5% in a general population reporting a history of TBI. • Prisoners who have had head injuries may also experience mental health problems such as severe depression and anxiety, substance use disorders, difficulty controlling anger, or suicidal thoughts and/or attempts. **Women:** • Although women are outnumbered by men in U.S. prisons and jails, their numbers more than doubled from 1990 to 2000. As of June 2005, more than 200,000 women were incarcerated. Women now represent 7% of the total U.S. prison population and 12% of the total U.S. jail population. • Women inmates who are convicted of a violent crime are more likely

APPENDIX 1-B: Mental Illness, including ADHD & Autism

[Focusing on genetic & epigenetically related disorders of Bipolar Disorder, Schizophrenia, Depression, ADHD & Autism. Additionally, special attention to PTSD. We believe these seem to be the most common "mental illnesses" among incarcerated and homeless people; although some of the disorders listed are arguably developmental disorders]

Source	Date	Summary
Lancet Psychiatry. 2016 Sep;3(9):871-81. doi: 10.1016/S2215-0366(16)30142-0. Epub 2016 Jul 14. **Mental health of prisoners: prevalence, adverse outcomes, and interventions.** Fazel S[1], Hayes AJ[2], Bartellas K[2], Clerici M[3], Trestman R[4]. **Author information** 1 Department of Psychiatry, University of Oxford, Warneford Hospital, Oxford, UK. Electronic address: seena.fazel@psych.ox.ac.uk. 2 Department of Psychiatry, University of Oxford, Warneford Hospital, Oxford, UK.	Sept. 2016	**Abstract** **More than 10 million people are imprisoned worldwide, and the prevalence of all investigated mental disorders is higher in prisoners than in the general population.** Although the extent to which prison increases the incidence of mental disorders is uncertain, considerable evidence suggests low rates of identification and treatment of psychiatric disorders. Prisoners are also at increased risk of all-cause mortality, suicide, self-harm, violence, and victimisation, and research has outlined some modifiable risk factors.

3 School of Medicine and Surgery, University of Milano-Bicocca, Milan, Italy. 4 Correctional Managed Health Care, University of Connecticut Health Center, Farmington, CT, USA.		Few high quality treatment trials have been done on psychiatric disorders in prisoners. Despite this lack of evidence, trial data have shown that opiate substitution treatments reduce substance misuse relapse and possibly reoffending. The mental health needs of women and older adults in prison are distinct, and national policies should be developed to meet these. **In this Review, we present clinical, research, and policy recommendations to improve mental health care in prisons.** **National attempts to meet these recommendations should be annually surveyed.**

J Correct Health Care. 2017 Jul;23(3):336-346. doi: 10.1177/1078345817716180. **Mental Disorders Among Criminal Offenders: A Review of the Literature.** Gottfried ED[1], Christopher SC[1]. **Author information** 1 1 Community & Public Safety Psychiatry Division, Department of Psychiatry and Behavioral Sciences, Medical University of South Carolina, Charleston, SC, USA.	July 2017	**Abstract** This article examines mental illness among adult, juvenile, male, female, jail, and prison inmates. It also explores the way in which mental health diagnoses impact offending and violent behavior. A review of literature pertaining to differences between the genders and age of offenders suggests that psychiatric disorders are more common among criminal offenders than the population at large. **Furthermore, it appears that many mentally ill offenders do not receive sufficient treatment during their incarcerations and that barriers inherent to incarceration prevent adequate treatment of mental illnesses.**

J Med Econ. 2015 Mar;18(3):219-29. doi: 10.3111/13696998.2014.971161. Epub 2014 Nov 26.

Economic impact of psychiatric relapse and recidivism among adults with schizophrenia recently released from incarceration: a Markov model analysis.

Lin I[1], Muser E, Munsell M, Benson C, Menzin J.

1 Boston Health Economics, Inc. , Waltham, MA , USA.

Mar. 2015

PubMed Link

Abstract

OBJECTIVES:
To develop an economic model that estimates the cost burden of psychiatric relapse and recidivism among patients with schizophrenia recently released from incarceration from a US state government perspective.

METHODS:

A Markov state-transition model was developed to estimate the numbers of schizophrenia patients recently-released from incarceration who would experience psychiatric relapse and/or arrest and re-incarceration over a period of 3 years, along with corresponding costs.

The model includes three health states: (1) in community, on therapy, (2) in community, off therapy, and (3) incarcerated.

It is assumed that a patient's probability of psychiatric hospitalization increases with treatment discontinuation, and the probability of arrest increases with the occurrence of a prior psychiatric hospitalization.

		Data from the US Census and Bureau of Justice Statistics were used to estimate the model population.

		Published literature was used to estimate the risks of psychiatric relapse, arrest, and all cost inputs. State-specific incarceration rates and sentence length data (from the state of Florida) were applied. The impact on outcomes and costs was evaluated by varying the rates of anti-psychotic treatment following release from incarceration and the annual risk of medication discontinuation. **RESULTS:** **Among 34,500 persons released from incarceration in the state of Florida annually, 5307 were estimated to have schizophrenia.** **The cumulative 3-year costs to the state government were $21,146,000 and $25,616,000 for criminal justice and psychiatric hospitalization costs, respectively ($3984 per patient criminal justice; $4827 per patient hospitalization costs).** **A relative 20% increase in the proportion of patients receiving antipsychotic treatment following release from**

		incarceration decreased total cumulative costs over 3 years by $1,871,100 ($353 per patient). **CONCLUSIONS:**

		The economic impact of psychiatric relapse and recidivism among patients with schizophrenia is substantial from the state government perspective. This general model can be made state-specific by utilizing local criminal justice data sources.

Lancet Psychiatry. 2015 Oct;2(10):891-900. doi: 10.1016/S2215-0366(15)00234-5. Epub 2015 Sep 2. **Psychiatric disorders and violent reoffending: a national cohort study of convicted prisoners in Sweden.** Chang Z[1], Larsson H[2], Lichtenstein P[2], Fazel S[3]. **Author information** 1 Department of Psychiatry, Warneford Hospital, University of Oxford, Oxford, UK; Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden. 2 Department of Medical Epidemiology and Biostatistics, Karolinska Institutet, Stockholm, Sweden. 3 Department of Psychiatry, Warneford Hospital, University of Oxford, Oxford, UK. Electronic address: seena.fazel@psych.ox.ac.uk.	Oct. 2015	**PubMed Link** **Abstract** **BACKGROUND:** **Reoffending and presence of psychiatric disorders are common in prisoners worldwide.** However, whether psychiatric disorders are risk factors for reoffending is still unknown. We aimed to examine the association between psychiatric disorders, including substance use disorder, and violent reoffending. **METHODS:** We did a longitudinal cohort study of 47,326 prisoners who were imprisoned since Jan 1, 2000, and released before Dec 31, 2009, in Sweden. We obtained data for diagnosed psychiatric disorders from both inpatient and outpatient registers, and sociodemographic and criminological factors from other population-based registers.

		We calculated hazard ratios (HRs) for violent reoffending with Cox regression. To control for potential familial confounding, we compared sibling prisoners with and without psychiatric disorders. We calculated population attributable fraction to assess the population effect. **FINDINGS:** **Diagnosed psychiatric disorders were associated with an increased hazard of violent reoffending in male (adjusted HR 1·63 [95% CI 1·57-1·70]) and female (2·02 [1·54-2·63]) prisoners, and these associations were independent of measured sociodemographic and criminological factors, and, in men, remained substantial after adjustment for unmeasured familial factors (2·01 [1·66-2·43]).** However, findings differed between individual diagnoses and sex. **We found some evidence of stronger effects on violent reoffending of alcohol and drug use disorders and bipolar disorder than of other psychiatric disorders.**

		Alcohol use disorder seemed to have a greater effect in women than in men (women 2·08 [1·66-2·60]; men 1·63 [1·56-1·71]). **The overall effects of psychiatric disorders did not differ with severity of crime.**

		The hazard of violent reoffending increased in a stepwise way with the number of diagnosed psychiatric disorders. **Assuming causality, up to 20% (95% CI 19-22) of violent reoffending in men and 40% (27-52) in women was attributable to the diagnosed psychiatric disorders that we investigated.** **INTERPRETATION:** **Certain psychiatric disorders are associated with a substantially increased hazard of violent reoffending.** **Because these disorders are prevalent and mostly treatable, improvements to prison mental health services could counteract the cycle of reoffending and improve both public health and safety.** **National violence prevention strategies should consider the role of prison health.** **FUNDING:**

		Wellcome Trust, Swedish Research Council, and Swedish Research Council for Health, Working Life and Welfare.

J Intellect Disabil Res. 2016 Mar;60(3):201-6. doi: 10.1111/jir.12237. Epub 2015 Oct 21.	Mar. 2016	**Abstract**

Characteristics of prisoners with neurodevelopmental disorders and difficulties.

McCarthy J[1], Chaplin E[2], Underwood L[1,3], Forrester A[1], Hayward H[1], Sabet J[1], Young S[4], Asherson P[5], Mills R[6], Murphy D[1].

Author information

1 Department of Forensic and Neurodevelopmental Sciences, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom.

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5 Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, Psychology & Neuroscience, King's College London, London, United Kingdom.

6 Research Autism, London, United Kingdom.

BACKGROUND:

Previous studies have found high rates of attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD) and intellectual disability (ID) within the criminal justice system (CJS).

However, little is understood about prisoners with neurodevelopmental disorders and difficulties (NDD) or their needs.

This study aimed to identify prisoners with NDD and compare their characteristics with prisoners without NDD on a range of socio-demographic and social functioning measures.

METHOD:

This was a descriptive, cross-sectional study carried out using face-to-face interviews with 240 participants in a London Category C prison. Standardised tools were used to assess prisoners for ADHD, ASD and ID.

RESULTS:

The study identified 87 prisoners who screened positive for one or more type of NDD. Participants with NDD were significantly younger and more likely to be single [(odds ratio) OR = 2.1],

		homeless (OR = 3.4) or unemployed (OR = 2.6) before they came into prison. They also had poorer educational achievements that those without NDD.

		Over 80% of those with NDD had a previous conviction or imprisonment. **CONCLUSIONS:** **The findings confirm the presence of significant numbers of people with NDD in a male prison. Services across the CJS are required for this group; specifically, there is a need for raised awareness among those working in the CJS to improve the recognition of offenders with NDD.** **Services in the community need to work with individuals with NDD who are at risk of offending, targeting those who are homeless, unemployed and have poor employment opportunities.**

APPENDIX 1-C: Substance Issues

Source	Date	Summary

Drug Alcohol Rev, 38 (4), 435-442 May 2019 **Prevalence of Cognitive Impairment in Patients With Substance Use Disorder** Carolien J W H Bruijnen, Boukje A G Dijkstra ... Cornelis A J DE Jongcollapse **Authors** Carolien J W H Bruijnen[1 2 3], Boukje A G Dijkstra[2 4], Serge J W Walvoort[1 2], Wiebren Markus[2 5], Joanne E L VanDerNagel[2 6 7], Roy P C Kessels[1 3 8], Cornelis A J DE Jong[2 9]	May 2019	**PubMed Link** **Abstract** **Introduction and aims:** Cognitive impairments in substance use disorder predict treatment outcome and are assumed to differ between substances. They often go undetected, thus the current study focuses on the prevalence of and differences in cognitive functioning across substances by means of a cognitive screen at the early stage of addiction treatment. **Design and methods:** The Montreal Cognitive Assessment was administered to outpatients seeking treatment for substance use disorder. Patient characteristics (age, years of regular use, polysubstance use, severity of dependence/abuse, depression, anxiety and stress) were also taken into account. **Results:** A total of 656 patients were included (n = 391 used alcohol, n = 123 used cannabis, n = 100 used stimulants and n = 26 used opioids).

Affiliations [1]Centre of Excellence for Korsakoff and Alcohol-Related Cognitive Disorders, Vincent van Gogh Institute for Psychiatry, Venray, The Netherlands. [2]Nijmegen Institute for ScientistPractitioners in Addiction, Radboud University, Nijmegen, The Netherlands. [3]Donders Institute for Brain, Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands. [4]Novadic-Kentron, Addiction Care Centre, Vught, The Netherlands. [5]IrisZorg, Centre for Addiction Treatment, Arnhem, The Netherlands.		The prevalence of cognitive impairments was 31%. Patients using alcohol had a lower total- and memory domain score than those using cannabis. Patients using opioids scored lower on visuospatial abilities than those using cannabis or stimulants. Younger patients scored higher than older patients. No effect was found for the other investigated characteristics. **Discussion and conclusions:** Given the high prevalence of cognitive impairments, standard screening at an early stage of treatment is important to determine the course of treatment and maximise treatment outcome. Caution is needed in interpreting results about opioids due to an underrepresentation of this patient group, and more research is needed on the effect of age on Montreal Cognitive Assessment performance.

[6]Tactus, Centre for Addiction and Intellectual Disability, Deventer, The Netherlands. [7]Aveleijn, Borne, The Netherlands.		

[8]Department of Medical Psychology, Radboud University Medical Centre, Nijmegen, The Netherlands. [9]Behavioural Science Institute, Radboud University, Nijmegen, The Netherlands. PMID: 30916448 PMCID: PMC6593747 DOI: 10.1111/dar.12922		

		## Abstract **Background and objectives: Data suggest individuals with substance use disorders (SUD) exhibit high rates of executive functioning (EF) impairment, and that EF level can predict treatment retention.** The primary aim of the present study was to investigate if patients who completed a 1 month intensive outpatient program (IOP) for SUD demonstrated recovered EF. **Methods:** Baseline and follow-up neurocognitive functioning was assessed by the Cambridge Neuropsychological Test Automated

		Battery (CANTAB) and the self-reported Behavior Rating Inventory of Executive Functioning (BRIEF-A) questionnaire. **Results:** The final sample included 15 patients who completed the one month IOP and for whom data were available (53% male, aged 36 years ± 13.4). Despite exhibiting general improvements in EF and significant improvements in organization, subjects continued to manifest significant executive dysfunction as evaluated by self-report and computerized assessment. **Conclusions and scientific significance:** Patients with SUD often manifest high levels of executive dysfunction upon entry into SUD treatment that, while improving minimally, appears to persist despite intensive outpatient treatment at 1 month. These persistent EF deficits may affect patient engagement and participation in treatment, thus necessitating SUD programs to assess and accommodate EF issues throughout treatment. (Am J Addict 2018;XX:1-7).

Appendix 1-D: Co-Morbidity

Source	Date	Summary

Exp Neurol. 2019 Jul;317:191-201. doi: 10.1016/j.expneurol.2019.03.003. Epub 2019 Mar 9. **Brain interrupted: Early life traumatic brain injury and addiction vulnerability.** Cannella LA[1], McGary H[2], Ramirez SH[3]. **Author information** 1	July 2019	**PubMed Link** **Abstract** **Recent reports provide evidence for increased risk of substance use disorders (SUD) among patients with a history of early-life traumatic brain injury (TBI).** Preclinical research utilizing animal models of TBI have identified injury-induced inflammation, blood-brain barrier

Department of Pathology and Laboratory Medicine, The Lewis Katz School of Medicine at Temple University, Philadelphia, PA 19140, USA; Center for Substance Abuse Research, The Lewis Katz School of Medicine at Temple University, Philadelphia, PA 19140, USA. 2 Department of Pathology and Laboratory Medicine, The Lewis Katz School of Medicine at Temple University, Philadelphia, PA 19140, USA. 3 Department of Pathology and Laboratory Medicine, The Lewis Katz School of Medicine at Temple University, Philadelphia, PA 19140, USA; Center for Substance Abuse Research, The Lewis Katz School of Medicine at Temple University, Philadelphia, PA 19140, USA; Shriners Hospitals Pediatric Research Center, The Lewis Katz School of Medicine at Temple University, Philadelphia, PA 19140, USA. Electronic address: servio@temple.edu.		permeability, and changes to synapses and neuronal networks within regions of the brain associated with the perception of reward. Importantly, these reward pathway networks are underdeveloped during childhood and adolescence, and early-life TBI pathology may interrupt ongoing maturation. As such, maladaptive changes induced by juvenile brain injury may underlie increased susceptibility to SUD. In this review, we describe the available clinical and preclinical evidence that identifies SUD as a persistent psychiatric consequence of pediatric neurotrauma by discussing (1) the incidence of early-life TBI, (2) how preclinical studies model TBI and SUD, (3) TBI-induced neuropathology and neuroinflammation in the corticostriatal regions of the brain, and (4) the link between childhood or adolescent TBI and addiction in adulthood. In summary, preclinical research utilizes an innovative combination of models of early-life TBI and SUD to recapitulate

		clinical features and to determine how TBI promotes a risk for the development of SUD. However, causal processes that link TBI and SUD remain unclear.

		Additional research to identify and therapeutically target underlying mechanisms of aberrant reward pathway development will provide a launching point for TBI and SUD treatment strategies.
Your Alberta **An Unhappy Triad: Brain Injury, Mental Illness and Addiction** **Dr. Garnet Cummings is the Executive Director of Brain Care Centre in Edmonton, Alberta.** **He was the Chief of Emergency at the Royal Alexandra Hospital until an accident left him with a brain injury.**	Mar. 2015	**Youtube** **Here Dr. Cummings discusses the "unhappy triad" of brain ıental illness and addiction.**

Health Soc Care Community. 2019 Jul;27(4):e125-e142. doi: 10.1111/hsc.12682. Epub 2018 Nov 13. **Cognitive impairment and homelessness: A scoping review.** Stone B[1], Dowling S[1], Cameron A[1]. **Author information** 1 University of Bristol, Bristol, UK.	July 2019	**PubMed Link** **Abstract** This paper reports the findings of a scoping review designed to identify research which has explored the relationship between cognitive impairment and homelessness.

		A systematic search of databases for articles published between 2007 and 2017 was conducted using keywords relating to cognitive impairments and homelessness. Sources were expanded using manual searches of citations and grey literature. Forty studies represented in 45 papers were selected for review using predefined inclusion criteria. Sources were subject to quality appraisal and data were extracted in line with review questions. Prevalence studies were over-represented in the review, while qualitative data were lacking. Aetiology of impairments was delineated by acquired and developmental causes. A variety of measures were employed by studies which were not validated in homeless populations. **Studies did not give sufficient consideration to co-occurring disorders and overlapping symptoms between aetiologies.** Because of these factors, it was difficult to conclude that all studies had accurately measured what they set out to; however, the evidence suggested that cognitive impairment was disproportionately over-represented in homeless populations.

		Cognitive impairment was found to be both a risk factor to and perpetuator of homelessness.

		Risk factors for homelessness were similar to those of the general population, though exaggerated by sequelae of certain cognitive impairments. **The results of this review suggest that more attention needs to be paid to the underlying socioeconomic disadvantages, persons with cognitive impairments face which may lead to homelessness.** **Further research should prioritise the voice of homeless persons with cognitive impairments, to better understand both causes of homelessness and effective methods of rehabilitation.**

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PTSD in prison settings: A systematic review and meta-analysis of comorbid mental disorders and problematic behaviours.

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PubMed Link

Abstract

PURPOSE:

Prevalence rates of PTSD are higher in the prison population than in the community.

We sought to systematically review the extent to which this disorder is associated with other mental health disorders and problematic suicidal or aggressive behaviours in the prison population.

METHODS:

		Studies reporting a relationship between PTSD and comorbid mental disorders and/or problematic behaviours in imprisoned adolescent and adult populations were identified from four bibliographic indexes. Primary studies involving clinical interviews, validated instruments leading to DSM or ICD diagnoses, or validated selfreport questionnaires such as the PTSD checklist were included. Random-effects meta-analysis was conducted where possible. Preferred Reporting Items for Systematic Reviews and MetaAnalyses (PRISMA) guidelines were followed. **RESULTS:** This review identified 36 studies, with a combined sample of 9594 participants, (6478 male and 2847 female prisoners) from 11 countries. Thirty-four of the identified studies employed a cross-sectional design. **We identified significant associations between PTSD and comorbid mental disorders including depression (OR = 3.4, 95% confidence interval (CI): 2.3-4.9), anxiety (OR = 2.9, 95%**

		confidence interval (CI): 1.8-4.7) and substance use (OR = 1.9, 95% confidence interval (CI): 1.5-2.4). We also identified significant associations between PTSD and suicidality (OR = 3, 95% confidence interval (CI): 2.4-3.8) and

		aggressive behaviours (this latter finding was not subject to meta-analysis). Significant methodological heterogeneity was identified between studies. **CONCLUSIONS:** **High rates of psychiatric comorbidity among prisoners with PTSD, and links to suicidal behaviour, self-harm and aggressive behaviour, provide further support for the need for trauma-informed treatment approaches in prisons.** **However, significant gaps in the current evidence were apparent. In particular, a lack of large, longitudinal studies meant that the temporal relationships between PTSD and relevant outcomes cannot currently be determined.**

Trials. 2017 Aug 4;18(1):365. doi: 10.1186/s13063-0172088-z. **Jail-to-community treatment continuum for adults with cooccurring substance use and mental disorders: study protocol for a pilot randomized controlled trial.**	Aug. 2017	**Abstract** **BACKGROUND:** Adults with co-occurring mental and substance use disorders (CODs) are overrepresented in jails. In-custody barriers to treatment, including a lack of evidence-based treatment options and the often short periods of incarceration, and limited communication between jails and community-based treatment agencies that can hinder immediate enrollment into community care once released have contributed to a cycle of limited treatment engagement, unaddressed criminogenic risks, and (re)arrest among this vulnerable and high-risk population.

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This paper describes a study that will develop research and communication protocols and adapt two evidence-based treatments, dual-diagnosis motivational interviewing (DDMI) and integrated group therapy (IGT), for delivery to adults with CODs across a jail-to-community treatment continuum.

METHODS/DESIGN:

Adaptations to DDMI and IGT were guided by the Risk-NeedResponsivity model and the National Institute of Corrections' implementation competencies; the development of the implementation framework and communication protocols were guided by the Evidence-Based Interagency Implementation Model for community corrections and the Inter-organizational Relationship model, respectively. Implementation and evaluation of the protocols and adapted interventions will occur via an open trial and a pilot randomized trial.

The clinical intervention consists of two in-jail DDMI sessions and 12 in-community IGT sessions. Twelve adults with CODs and four clinicians will participate in the open trial to evaluate the acceptability and feasibility of, and fidelity to, the interventions and research and communication protocols.

The pilot controlled trial will be conducted with 60 inmates who will be randomized to either DDMI-IGT or treatment as usual.

		A baseline assessment will be conducted in jail, and four community-based assessments will be conducted during a 6month follow-up period. Implementation, clinical, public health, and treatment preference outcomes will be evaluated. **DISCUSSION:**

		Findings have the potential to improve both jail- and community-based treatment services for adults with CODs as well as inform methods for conducting rigorous pilot implementation and evaluation research in correctional settings and as inmates re-enter the community. **Findings will contribute to a growing area of work focused on interrupting the cycle of limited treatment engagement, unaddressed criminogenic risks, and (re)arrest among adults with CODs [Co-Occurring Disorders].**

Neuropsychology. 2019 Jul;33(5):711-724. doi: 10.1037/neu0000525. Epub 2019 May 30. **Trauma-related psychiatric and behavioral conditions are uniquely associated with sustained attention dysfunction.** Esterman M[1], Fortenbaugh FC[1], Pierce ME[1], Fonda JR[1], DeGutis J[1], Milberg W[1], McGlinchey R[1]. **Author information** 1 Translational Research Center for TBI and Stress Disorders.	July 2019	**PubMed Link** **Abstract** **OBJECTIVE:** Although previous work has generally attempted to isolate the unique cognitive effects of common combat-related comorbidities, less work has been done to examine how these conditions co-occur, and whether unique cognitive signatures accompany certain clinical combinations. **METHOD:**

		To address this gap, we examined how several deploymentrelated conditions were associated with performance on a wellvalidated measure of sustained attention (i.e., gradual onset continuous performance task [gradCPT]) and a battery of standard neuropsychological measures in 123 Veterans from the Translational Research Center for TBI and Stress Disorders. Initially, a Principal component analysis was conducted to investigate how comorbid conditions grouped together. **RESULTS:** Several sustained attention measures from the gradCPT were differentially associated with four unique combinations of traumarelated pathology. Specifically, a somatic component representing the combination of current pain, sleep disturbance, and mild traumatic brain injury was associated with a higher rate of failures of attentional engagement. On the other hand, a comorbid posttraumatic stress disorder (PTSD) and mood disorder component (moodPTSD), as well as a substance use disorder component, were associated with higher rates of inhibitory control failures. Increased attentional instability was associated with mood, PTSD as well as an anxiety disorder component. In contrast, the cognitive effects of deployment-related trauma were not observed on standard neuropsychological measures.

		CONCLUSION:

		These findings suggest that unique combinations of trauma related pathology have dissociable effects on sustained attentional control.