

Annotated Bibliography

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Annotated Bibliography

TBI RATES

Langlois, J. A., Rutland-Brown, W., & Wald, M. M. (2006). The epidemiology and impact of traumatic brain injury: a brief overview. *Journal of Head Trauma Rehabilitation, 21*(5), 375-378.

It is estimated that an average 1.4 million TBIs occur annually in the United States with 5.3 million individuals currently living with disabilities related to TBI (Langlois, Rutland-Brown, & Wald, 2006). It is also hypothesized that the true number of individuals living with TBI disabilities is higher than reported as not all TBIs are treated and reported in a healthcare setting. The authors also concluded that the cost of TBI annually in terms of medical and lost productivity is estimated to be \$60 billion.

TBI BARRIERS

Hall, K. M., Karzmark, P., Stevens, M., Englander, J., O'Hare, P., & Wright, J. (1994). Family stressors in traumatic brain injury: a two-year follow-up. *Archives of Physical Medicine & Rehabilitation, 75*(8), 876-884.

This study follows patients with TBI over the course of 2 years (Hall et al., 1994). Within the first year, the most frequently reported difficulties by relatives included: poor memory, fatigue, social withdrawal, and evidence of disinhibition (particularly anger). By the second year, incidences of angry outbursts increased, as well as self-centeredness, rigidity, and reduced initiation. Thirty-five percent of caregivers reported that the severity of temper outbursts became significantly greater.

Brooks, N., Campsie, L., Symington, C., Beattie, A., & McKinlay, W. (1986). The five year outcome of severe blunt head injury: a relative's view. *Journal of Neurology, Neurosurgery & Psychiatry, 49*(7), 764-770.

This study asked relatives of TBI patients to evaluate behavioral and cognitive changes over a 5 year course (Brooks, Campsie, Symington, Beattie, & McKinlay, 1986). After the first year, relatives reported high levels of behavioral change and reported violence increased after 5 years. Disturbed behavior increased from the 1 year to the 5 year follow up, suggesting that behavior continues to worsen as time passes.

Ryan, N. P., Hughes, N., Godfrey, C., Rosema, S., Catroppa, C., & Anderson, V. A. (2015).

Prevalence and Predictors of Externalizing Behavior in Young Adult Survivors of Pediatric Traumatic Brain Injury. *The Journal of Head Trauma Rehabilitation, 30*(2), 75-85.

This article discusses the effects of TBI on children, specifically mentioning the physiology and how it affects behavior (Ryan et al., 2015). It suggests that children experiencing a TBI are at risk for persistent offending. The experiment followed pediatric TBI and evaluated participants up to 16 years post injury. The results show a 5% to 10% prevalence rate of aggression, suggesting that pediatric TBI is associated with an elevated risk for long-term problems with aggression, rule breaking, and conduct problems.

AGGRESSION AND CRIMINAL BEHAVIOR

Leon-Carrion, J., & Ramos, F. J. (2003). Blows to the head during development can predispose to violent criminal behaviour: rehabilitation of consequences of head injury is a measure for crime prevention. *Brain Injury, 17*(3), 207-216.

Leon-Carrion and colleagues examined a group of violent and nonviolent offenders (Leon-Carrion & Ramos, 2003). They found that while both groups had a history of academic challenges, the violent group had a significantly higher rate of untreated head injuries. In conclusion, academic difficulties alone are not enough to predict violent behavior in offenders, but the combination of untreated head injuries and academic challenges did successfully predict future violence.

Sarapata, M., Herrmann, D., Johnson, T., & Aycock, R. (1998). The role of head injury in cognitive functioning, emotional adjustment and criminal behaviour. *Brain Injury*, *12*(10), 821-842.

This study investigated the relationship between head injury and criminal activity (Sarapata, Herrmann, Johnson, & Aycock, 1998). Groups from head injured offenders, non-head injured felons, non-injured non-felons, and head injured non-offenders. Offenders (head injured) reported poorer cognition, greater emotionality, and more aggressiveness than non-head injured offenders and non-offenders. (83% of felons with reported brain injury also reported that the injury occurred prior to their first encounter with the law.

Dyer, K. F., Bell, R., McCann, J., & Rauch, R. (2006). Aggression after traumatic brain injury: analysing socially desirable responses and the nature of aggressive traits. *Brain Injury*, *20*(11), 1163-1173.

This experiment studied how social desirability can influence self-reported aggression in brain injury patients (Dyer, Bell, McCann, & Rauch, 2006). It found that social desirability was a highly significant predictor of self-reported aggression. It also found

that impulsive verbal aggression and anger are primary reported aggressive traits after brain injury.

Brower, M. C., & Price, B. H. (2001). Neuropsychiatry of frontal lobe dysfunction in violent and criminal behaviour: a critical review. *Journal of Neurology, Neurosurgery & Psychiatry*, 71(6), 720-726.

This article examines the relationship between specific locations of brain damage and aggression (Brower & Price, 2001). Researchers found that those who had damaged prefrontal cortexes were more aggressive. They also report a relationship between executive functioning and aggression; the lower the executive function, the higher the aggression.

TBI RATES WITHIN THE CORRECTIONAL POPULATION

Shiroma, E. J., Ferguson, P. L., & Pickelsimer, E. E. (2012). Prevalence of traumatic brain injury in an offender population: a meta-analysis.[Reprint in *J Head Trauma Rehabil.* 2012 May-Jun;27(3):E1-10; PMID: 22573043]. *Journal of Correctional Health Care*, 16(2), 147-159.

Shiroma and colleagues conducted a meta-analysis of 20 epidemiological studies and estimated that 60.25% (95% CI: 48.08 to 72.41) of the total offender population has a history of TBI (Shiroma, Ferguson, & Pickelsimer, 2012). TBI diagnosis for this study included at a minimum one episode with loss of consciousness (LOC). It was also apparent that different offender samples have different TBI rates. The authors suggested that including multiple offender types in the same prevalence estimate may not be appropriate as some offenses carried significantly higher rates of TBI.

Williams, W. H., Mewse, A. J., Tonks, J., Mills, S., Burgess, C. N., & Cordan, G. (2010).

Traumatic brain injury in a prison population: prevalence and risk for re-offending. *Brain Injury*, 24(10), 1184-1188.

Williams and colleagues found that 65% of their offender sample reported a TBI. Sixteen percent of this sample reported moderate to severe head injuries (Williams et al., 2010).

They also reported that adults with TBI were younger at entry and had higher rates of reoffending. They also reported that the TBI sample spent greater time in prison within the last five years prior to screening as well as a higher rate of offending.

Colantonio, A., Stamenova, V., Abramowitz, C., Clarke, D., & Christensen, B. (2007). Brain injury in a forensic psychiatry population. *Brain Injury*, 21(13-14), 1353-1360.

The authors examined the differences between offenders with TBI and offenders without. The results concluded that there were more offenders with TBI than without (Colantonio, Stamenova, Abramowitz, Clarke, & Christensen, 2007). The prevalence of alcohol/drug abuse among TBI is also discussed; alcohol/substance abuse appear to be predisposing factors for TBI and persist after TBI.

Ray, B., Sapp, D., & Kincaid, A. (2014). Traumatic Brain Injury among Indiana State Prisoners. *Journal of Forensic Sciences (Wiley-Blackwell)*, 59(5), 1248-1253.

Ray and colleagues screened all male inmates entering Indiana state prisons for one month (N=831) using the OSU-TBI-ID (Ray, Sapp, & Kincaid, 2014). They found that 35.7% of all entering inmates indicated a possible history of TBI with 10.1% of those indicating moderate to severe injuries. They also found that inmates with a history of TBI were 1.5 times more likely to have a prior arrest than those without a TBI history.

Perron, B. E., & Howard, M. O. (2008). Prevalence and correlates of traumatic brain injury among delinquent youths. *Criminal Behaviour & Mental Health, 18*(4), 243-255.

Delinquent youths with TBI from this study were significantly more likely to have used illegal drugs (Perron & Howard, 2008). They were also more likely to have been injured as a result of violence. A high rate of TBI was reported in the studied delinquent youth as about one in five reported a brain injury. Findings from this study suggest that assaults/fights are a significant source of TBI in this population.

Farrer, T. J., & Hedges, D. W. (2011). Prevalence of traumatic brain injury in incarcerated groups compared to the general population: a meta-analysis. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 35*(2), 390-394.

The purpose of this analysis is to characterize the association between TBI and incarceration. This is done by looking at the prevalence of TBI in incarcerated samples and comparing that figure to the prevalence of TBI in the general population. Results showed that the significance of TBI was significantly higher in incarcerated samples than in the general population (Farrer & Hedges, 2011). It also presents the case that there appears to be an association between TBI and incarceration.

This report is useful because it gives a general baseline of how many incarcerated people likely have some sort of TBI. The article discusses samples from forensic patients with a high percentage of TBI and another sample from death row inmates (TBI rate of 100%). It also goes in depth to explain the association between TBI and behavioral problems, further suggesting an association with incarceration.

Slaughter, B., Fann, J. R., & Ehde, D. (2002). Traumatic brain injury in a county jail population: prevalence, neuropsychological functioning and psychiatric disorders. *Brain Injury*, 17(9), 731-741.

To determine the prevalence of TBI in a jail population, inmates were interviewed with a standardized test battery (Slaughter, Fann, & Ehde, 2002). The neuropsychological test battery included *Brief Anger and Aggression Questionnaire*, *Controlled Oral Word Association Test*, *Oklahoma Pre-morbid Intelligence Estimate*, *Primary Care Evaluation of Mental Disorders*, *Trail Making Test A and B*, and *Wechsler Memory Scale-Revised: Logical Memory I and II*. 36.2% of participants reported a TBI in the 12 months prior to interview while 87% of the sample reported TBI at some other time in their life (29% reporting lifetime history of moderate/severe TBI).

TBI AND DOC BARRIERS

Bufkin, J. L., & Luttrell, V. R. (2005). Neuroimaging studies of aggressive and violent behavior: current findings and implications for criminology and criminal justice. *Trauma Violence & Abuse*, 6(2), 176-191.

This article attempts to explain behavior based on the physiology of the brain. It also discusses risk factors for recidivism for offenders with brain dysfunction (defined as repeated violent offending) (Bufkin & Luttrell, 2005). Reduced prefrontal to subcortical ratios may lead to aggression and increased violence in the future. One of the more interesting notes from this article discusses criminology/criminal justice tends to ignore biological factors for aggression, comparing the biological analyses to be analogous to those of Lambroso's. (Lambroso was an Italian criminologist and physician-he helped identify criminals (specifically mafiosi) - he used physical features to determine if

someone was part of the mafia/ had violent tendencies. By comparing the two methods of recognizing aggression, it suggests that “behavioral scientists retain notions of a born criminal being easily identifiable by a test.”)

Chen, M. K., & Shapiro, J. M. (2007). Do Harsher Prison Conditions Reduce Recidivism? A Discontinuity-based Approach. *American Law and Economics Review*, 1, 1-29.

This article looks at how incarceration, specifically prison conditions, can impact inmates’ behavior. The findings suggest that harsher prison conditions do not reduce recidivism, but might actually increase it (Chen & Shapiro, 2007).

Piccolino, A. L., & Solberg, K. B. (2013). The Impact of Traumatic Brain Injury on Prison Health Services and Offender Management. *Journal of Correctional Health Care*, 20(3), 203-212.

The purpose of this experiment was to look at the relationship between TBI and use of correctional medical/psychological services, chemical dependency treatment completion, in-prison rule infractions, and recidivism (Piccolino & Solberg, 2013). The authors discuss how offenders with a high probability of brain injury were less likely to accept treatment and the chance of recidivism increases.

The article also mentions a correctional facility in Minnesota that is emphasizing TBI; they train and educate their staff about the impact of TBI on behavior. Minnesota is also the first state correctional system to implement a TBI-specific release planner.

Hughes, N., Williams, W. H., Chitsabesan, P., Walesby, R. C., Mounce, L. T. A., & Clasby, B. (2015). The Prevalence of Traumatic Brain Injury Among Young Offenders in Custody: A Systematic Review. *The Journal of Head Trauma Rehabilitation*, 30(2), 94-105.

This paper poses a relationship between childhood TBI and incarceration (Hughes et al., 2015). There is a prevalence of TBI in young offenders in custody that is greater than those of the general population. Reported prevalence rates of BI (some form of head injury during childhood) among incarcerated youth is 16.5% to 72.1% with a 100% rate among young people sentenced to death. Between 49.7% and 71.2% of incarcerated youth reported some type of head injury with 16.5 to 49% of those experiencing loss of consciousness.

INTERVENTIONS

Graffam, J., Shinkfield, A. J., & Lavelle, B. (2014). Recidivism Among Participants of an

Employment Assistance Program for Prisoners and Offenders. *International Journal of Offender Therapy & Comparative Criminology*, 58(3), 348-363.

Graffam and colleagues studied recidivism rates in an Australian prison population. They offered 3,034 participants an employment assistance program (Graffam, Shinkfield, & Lavelle, 2014). Studying the program completers revealed a recidivism rate of 7.46% which is well below established Australian recidivism rates (the established rates were not reported). The researchers did compare reoffending rates before and after the employment program and found that program completers showed a significant decline in number of offenses per day after the intervention.

Chitsabesan, P., Lennox, C., Williams, H., Tariq, O., & Shaw, J. (2015). Traumatic Brain Injury in Juvenile Offenders: Findings From the Comprehensive Health Assessment Tool Study and the Development of a Specialist Linkworker Service. *The Journal of Head Trauma Rehabilitation*, 30(2), 106-115.

The purpose of this study was to describe the profile of a juvenile offender with TBI and associated comorbidity, as well as describe the development of a brain injury service for juveniles with TBI in custody (Chitsabesan, Lennox, Williams, Tariq, & Shaw, 2015). Researchers found that 82% of the participants (juvenile offenders in custody) reported a TBI with loss of consciousness or confusion, while 44% of those participants reported ongoing post-concussion symptoms. Causes of TBI included fights (41%), falls (21%), and road accidents (55%).

Efforts to develop a program specifically for offenders with TBI included screening, assessment, interventions, and discharge planning/community service. The screening process used the CHAT to refer the participant on to screening with the Brain Injury Screening Index and Cognistat. Existing medical records and information from both the juvenile system and education services are reviewed.

The assessment aspect of the program allows individuals to self-report concerns or difficulties, followed by neurocognitive tests if needed. The Brain Injury Rehabilitation Trust Memory and Information Processing Battery and the Behavior Rating Inventory of Executive Function are both used to assess executive function in youth. The assessment also includes development goals set by the offender and is finally followed by an IQ assessment using the Wechsler Intelligence Scale for Children or referral for a neurology assessment.

Interventions offer support for young offenders with TBI with education on what is happening in their brain and why they behave differently, behavioral strategies involving functional intervention, coping strategies, and techniques. Indirect support is also

beneficial for intervention strategies such as speaking with a nurse, educational staff, and key worker.

Discharge and planning/community interventions include a discharge summary to be handed out to the community justice team and primary care physician. Some young offenders may also seek assistance from a specialist brain injury rehabilitation service. The key specialist will work with the offender by helping schedule and keep appointments, reintegrating into the education system and encouraging community services for more support.

CURRENT SCREENING METHODOLOGY

Schofield, P., Butler, T., Hollis, S., & D'Este, C. (2011). Are prisoners reliable survey respondents? A validation of self-reported traumatic brain injury (TBI) against hospital medical records. *Brain Injury*, 25(1), 74-82.

The validity of prisoners' responses has been questioned due to the stereotype of being inherently dishonest and manipulative (Schofield, Butler, Hollis, & D'Este, 2011). This study claims that prisoners' self-report of TBI is generally accurate. They were able to determine this by administering a questionnaire to the prisoners, asking about TBI history. Researchers then requested medical records to compare notes of TBI reports. This article also discusses the reasons that some records may be inaccurate, such as memory loss due to trauma from drugs or violence. Overall, 70% of the self-reported TBIs were validated by medical records.

This study can be useful in trying to determine the validity of our participants. It is difficult to know whether or not the participant wants help, also this article would argue that most are honest because they want to receive treatment.

Bogner, J., & Corrigan, J. D. (2009). Reliability and predictive validity of the Ohio State University TBI identification method with prisoners. *Journal of Head Trauma Rehabilitation, 24*(4), 279-291.

Reliability and validity of the OSU-TBI-ID was tested with 210 male and female adults in two prison settings (Bogner & Corrigan, 2009). They found that 78% of the sample experienced a history of TBI with 14% suffering moderate to severe TBI. Test re-test reliabilities were greater than .60 on all indices with most indices falling between .70 and .91. Three clear factor structures were identified.

References

- Bogner, J., & Corrigan, J. D. (2009). Reliability and predictive validity of the Ohio State University TBI identification method with prisoners. *Journal of Head Trauma Rehabilitation, 24*(4), 279-291.
- Brooks, N., Campsie, L., Symington, C., Beattie, A., & McKinlay, W. (1986). The five year outcome of severe blunt head injury: a relative's view. *Journal of Neurology, Neurosurgery & Psychiatry, 49*(7), 764-770.
- Brower, M. C., & Price, B. H. (2001). Neuropsychiatry of frontal lobe dysfunction in violent and criminal behaviour: a critical review. *Journal of Neurology, Neurosurgery & Psychiatry, 71*(6), 720-726.
- Bufkin, J. L., & Luttrell, V. R. (2005). Neuroimaging studies of aggressive and violent behavior: current findings and implications for criminology and criminal justice. *Trauma Violence & Abuse, 6*(2), 176-191.
- Chen, M. K., & Shapiro, J. M. (2007). Do Harsher Prison Conditions Reduce Recidivism? A Discontinuity-based Approach. *American Law and Economics Review, 1*, 1-29.
- Chitsabesan, P., Lennox, C., Williams, H., Tariq, O., & Shaw, J. (2015). Traumatic Brain Injury in Juvenile Offenders: Findings From the Comprehensive Health Assessment Tool Study and the Development of a Specialist Linkworker Service. *The Journal of Head Trauma Rehabilitation, 30*(2), 106-115.
- Colantonio, A., Stamenova, V., Abramowitz, C., Clarke, D., & Christensen, B. (2007). Brain injury in a forensic psychiatry population. *Brain Injury, 21*(13-14), 1353-1360.

- Dyer, K. F., Bell, R., McCann, J., & Rauch, R. (2006). Aggression after traumatic brain injury: analysing socially desirable responses and the nature of aggressive traits. *Brain Injury*, 20(11), 1163-1173.
- Farrer, T. J., & Hedges, D. W. (2011). Prevalence of traumatic brain injury in incarcerated groups compared to the general population: a meta-analysis. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, 35(2), 390-394.
- Graffam, J., Shinkfield, A. J., & Lavelle, B. (2014). Recidivism Among Participants of an Employment Assistance Program for Prisoners and Offenders. *International Journal of Offender Therapy & Comparative Criminology*, 58(3), 348-363.
- Hall, K. M., Karzmark, P., Stevens, M., Englander, J., O'Hare, P., & Wright, J. (1994). Family stressors in traumatic brain injury: a two-year follow-up. *Archives of Physical Medicine & Rehabilitation*, 75(8), 876-884.
- Hughes, N., Williams, W. H., Chitsabesan, P., Walesby, R. C., Mounce, L. T. A., & Clasby, B. (2015). The Prevalence of Traumatic Brain Injury Among Young Offenders in Custody: A Systematic Review. *The Journal of Head Trauma Rehabilitation*, 30(2), 94-105.
- Langlois, J. A., Rutland-Brown, W., & Wald, M. M. (2006). The epidemiology and impact of traumatic brain injury: a brief overview. *Journal of Head Trauma Rehabilitation*, 21(5), 375-378.
- Leon-Carrion, J., & Ramos, F. J. (2003). Blows to the head during development can predispose to violent criminal behaviour: rehabilitation of consequences of head injury is a measure for crime prevention. *Brain Injury*, 17(3), 207-216.
- Perron, B. E., & Howard, M. O. (2008). Prevalence and correlates of traumatic brain injury among delinquent youths. *Criminal Behaviour & Mental Health*, 18(4), 243-255.

- Piccolino, A. L., & Solberg, K. B. (2013). The Impact of Traumatic Brain Injury on Prison Health Services and Offender Management. *Journal of Correctional Health Care*, 20(3), 203-212.
- Ray, B., Sapp, D., & Kincaid, A. (2014). Traumatic Brain Injury among Indiana State Prisoners. *Journal of Forensic Sciences (Wiley-Blackwell)*, 59(5), 1248-1253.
- Ryan, N. P., Hughes, N., Godfrey, C., Rosema, S., Catroppa, C., & Anderson, V. A. (2015). Prevalence and Predictors of Externalizing Behavior in Young Adult Survivors of Pediatric Traumatic Brain Injury. *The Journal of Head Trauma Rehabilitation*, 30(2), 75-85.
- Sarapata, M., Herrmann, D., Johnson, T., & Aycock, R. (1998). The role of head injury in cognitive functioning, emotional adjustment and criminal behaviour. *Brain Injury*, 12(10), 821-842.
- Schofield, P., Butler, T., Hollis, S., & D'Este, C. (2011). Are prisoners reliable survey respondents? A validation of self-reported traumatic brain injury (TBI) against hospital medical records. *Brain Injury*, 25(1), 74-82.
- Shiroma, E. J., Ferguson, P. L., & Pickelsimer, E. E. (2012). Prevalence of traumatic brain injury in an offender population: a meta-analysis.[Reprint in J Head Trauma Rehabil. 2012 May-Jun;27(3):E1-10; PMID: 22573043]. *Journal of Correctional Health Care*, 16(2), 147-159.
- Slaughter, B., Fann, J. R., & Ehde, D. (2002). Traumatic brain injury in a county jail population: prevalence, neuropsychological functioning and psychiatric disorders. *Brain Injury*, 17(9), 731-741.

Souza, C. A. D. (2003). Frequency of brain injury in a forensic psychiatric population. *Rev Bras Psiquiatr*, 25(4), 206-211.

Williams, W. H., Mewse, A. J., Tonks, J., Mills, S., Burgess, C. N., & Cordan, G. (2010). Traumatic brain injury in a prison population: prevalence and risk for re-offending. *Brain Injury*, 24(10), 1184-1188.