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Elevated Prevalence of Adverse Childhood Experiences in Severe Gambling Disorder: A Pilot Study in U.S. Veterans

Toby Chen,¹ Heather Chapman,^{2,3} P. Eric Konicki,^{2,3} Peijun Chen,^{2,3} & George E. Jaskiw^{2,3}

¹ College of Arts and Sciences, Duke University, Durham, North Carolina, USA

² Department of Psychiatry, Veterans Affairs Northeast Ohio Healthcare System, Cleveland, Ohio, USA

³ School of Medicine, Case Western University, Cleveland, Ohio, USA

Abstract

Gambling disorder (GD) is associated with a higher prevalence of adverse childhood experiences (ACEs). Whether this applies to groups such as U.S. veterans, who already have elevated ACEs, is not known. In this pilot study, we extracted ACEs from the charts of a random sample ($n = 19$) male veterans in residential GD treatment and compared them to those from a general veteran sample ($n = 154$, 30 females, 124 males). The GD group had an elevated prevalence (79% vs. 37%) of three or more ACEs and a lower prevalence (5% vs. 49%) of one or fewer ACEs. Within groups with elevated ACEs, higher ACE load may still confer a higher risk of adult GD.

Keywords: adverse childhood experiences, gambling disorder, veterans

Introduction

As legal gambling has increased across the United States (1999–2013; Horváth & Paap, 2012), the odds of being a problem gambler have risen by 6% for each additional type of gambling that has become available (Welte et al., 2016). Concurrently, adverse childhood experiences (ACEs) have been identified as potential factors in the development of a broad range of medical and mental disorders (Hughes et al., 2017). Although preliminary studies suggest a general association between ACEs and pathological gambling (Etuk et al., 2020; Poole et al.,

2017), whether this link persists within groups that already have an elevated prevalence of ACEs is not known.

Members of the U.S. Armed Forces have a 2-fold higher prevalence of ACEs than civilians (Blosnich et al., 2014). High rates of ACEs were suspected in a veteran cohort admitted for residential gambling disorder (GD) treatment, but controls were not available (Kausch et al., 2006). In veterans from the Vietnam Era Twin Registry, GD, as described in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.; *DSM-III-R*; American Psychiatric Association, 1987), was associated with non-specific childhood abuse or neglect (Scherrer et al., 2007). More recently, veterans at risk for problem gambling reported more traumatic experiences overall, but were not asked to distinguish childhood from adult experiences (Stefanovics et al., 2017). Our clinical impression has been that veterans who we treated in a residential GD treatment program were reporting unusually high levels of ACEs. To examine this prospectively would require adding a formal ACE inventory to an already time-intensive intake assessment. Therefore, we decided to first conduct a retrospective chart-based pilot study.

Methods

This institutional review board-approved chart review study targeted participants in the Department of Veterans Affairs National Residential Gambling Treatment Program. In adherence with American Society of Addiction Medicine guidelines, participants were admitted because less-intensive treatment efforts had proved inadequate. Entrants participated in a series of unstructured clinical interviews that captured developmental and family history. On the basis of that history, two investigators independently extracted the 10-item Adverse Childhood Experience (ACE) Questionnaire, in a random sample of male participants with GD ($N = 19$, out of 154 available files). The ACE is a standard instrument used to quantify childhood trauma and adverse experiences (Centers for Disease Control and Prevention [CDC], 2010). In cases of discrepancy, the raters reached a consensus rating. The data were collapsed into eight traditional ACE categories (CDC, 2010). Descriptive measures were calculated, and the distribution compared with ACEs reported for a general sample of veterans (Blosnich et al., 2014) by using a chi-square test to generate a Monte Carlo simulated p -value ($p < .05$).

Results

The all-male sample ($N = 19$: 16 Caucasian, 2 African American, 1 Asian American) had a mean age of 51.9 ± 2.7 (SEM) years. Twelve individuals had a history of a suicide attempt. The distribution of the number of different ACEs experienced by the sample with GD was significantly different ($p < .003$) from that reported in the literature controls. The GD group had relatively few individuals with one or fewer ACEs (5.3% vs. 49.0%) but a higher number with three or more ACEs (78.9% vs. 36.6%) (see Table 1 and Figure 1). Compared with the general veteran population, the GD group experienced a 2-fold elevation of childhood physical abuse, sexual

Table 1

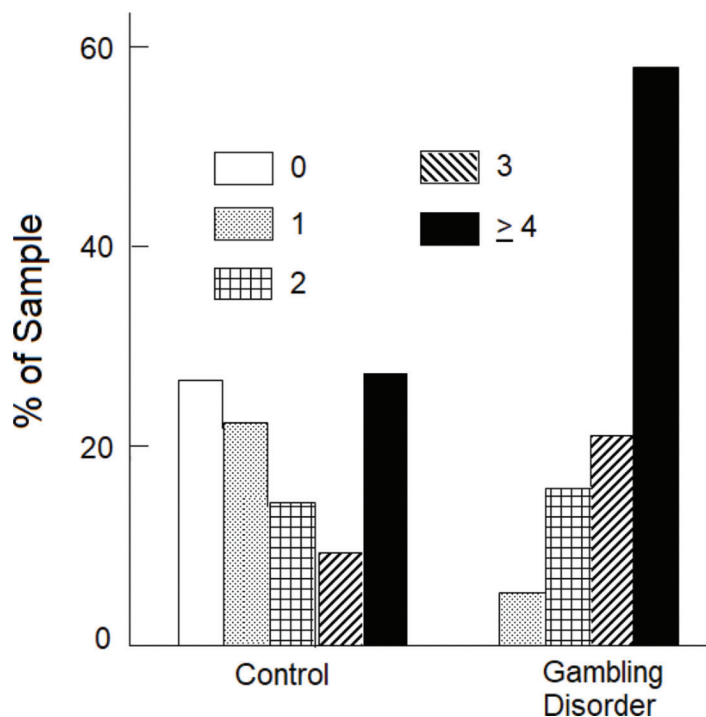
Prevalence of Adverse Childhood Experiences (ACEs) in Participants in a Gambling Treatment Program for Veterans Versus the General Veteran Population

ACE	Prevalence among participants with gambling disorder (GD), % (<i>n</i> = 19)	Prevalence among controls, % (<i>n</i> = 1,586) ^a	Ratio participants with GD/controls
Household mental illness	63.2	23.3	2.7
Household substance abuse	89.5	34.3	2.6
Physical abuse	57.9	29.1	2.0
Sexual abuse	21.1	11.0	1.9
Parental separation or divorce	68.4	38.5	1.8
Emotional abuse	52.6	43.0	1.2
Intimate partner violence	21.1	27.3	0.8
Incarcerated household member	5.3	12.3	0.4

^aAdapted from "Premilitary Trauma as a Correlate of Suicidal Ideation Among Veterans," by J. R. Blosnich and R. M. Bossarte, 2017, *Psychiatric Services*, 68(8), p. 755 (<https://doi.org/10.1176/appi.ps.201700186>). Copyright 2017 by the American Psychiatric Association.

Figure 1

Total Number of Different Adverse Childhood Experiences in Participants in a Gambling Treatment Program for Veterans Versus the General Veteran Population.



Note. The proportion of scores was significantly different ($p < .003$) between groups.

abuse, and parental separation or divorce, and was exposed to caregivers with an almost 3-fold elevation of substance use and mental illness. Neither exposure to household intimate partner violence nor having an incarcerated household member appeared to confer increased risk of GD.

Discussion

Compared with a general sample of veterans, a sample of veterans in our residential gambling treatment program were over twice as likely to have experienced three or more ACEs (Table 1) and had a 2-fold higher likelihood of exposure to five of eight ACE categories (Figure 1). We emphasize that our findings emerge from a relatively small all-male sample that we compared with literature controls (Blosnich et al., 2014). ACE elements were extracted from the chart on the basis of early life and developmental information obtained through semi-structured clinical interviews, rather than from the usual ACEs interview (CDC, 2010). We would argue, however, that our approach, raises the risk of undercounting ACEs and hence of underestimating the association between ACEs and problem gambling in our sample.

Our veterans had severe GD that persisted despite other forms of treatment, and they were willing to accept residential treatment. Nonetheless, the results suggest that even in a population with an above-average background prevalence of serious adverse events (SAEs; Blosnich et al., 2014), there may be a dose-response effect between additional SAEs and the development of severe GD. The prevalence of having experienced > 4 ACEs was about 2-fold higher in those with severe GD than in veterans in general (Table 1). Analogous dose effects have been reported previously. In a sample of community gamblers recruited over the internet, problem gambling was associated with an almost 3-fold higher likelihood of having self-reported > 3 ACEs (Poole et al., 2017). A graded dose-response relationship has also been detected between ACEs and adult depression, substance use, and suicide attempts (Merrick et al., 2017). Indeed, in the original investigation of ACEs, those who self-reported > 4 ACEs were 4- to 12-fold more likely to experience a range of adverse physical and mental health effects (Felitti et al., 1998)

Although U.S. military veterans have a 2-fold higher prevalence of GD relative to that in civilians (Etuk et al., 2020), the possible contribution of ACEs to this phenomenon has been understudied. One group commented, without using controls, on the high prevalence of early trauma in veterans engaged in residential treatment for GD (4th ed. of *DSM*; American Psychiatric Association, 1994; Kausch et al., 2006). An evaluation of veterans from the Vietnam Era Twin Registry found that childhood neglect or rape was associated with a greater than 5-fold elevation of GD (*DSM-III-R*) in adulthood (Scherrer et al., 2007). In another veteran sample, problem gambling that was identified by using a structured questionnaire was associated with a range of traumatic experiences; however, adult and childhood experiences were conflated (Stefanovics et al., 2017). The heterogeneity in diagnostic criteria notwithstanding, our data support and extend the results of these earlier studies.

The nature of the SAEs associated with severe gambling raises intriguing questions. In our sample, the prevalence of experiencing incarceration of a household member was about half that of the control group (Table 1). One could speculate that in a severely stressed household, removal of a markedly abusive or disruptive individual could lower domestic dysfunction and/or maltreatment. In contrast, household substance use or the experience during childhood of having a family member with mental illness were each associated with an almost 3-fold higher prevalence of severe gambling (Table 1). Such results are consistent with studies that group individual ACEs into larger categories (e.g., household dysfunction vs. maltreatment) and find qualitative as well as quantitative effects of ACEs on adverse psychiatric outcomes (Negriff, 2020).

Our findings add to the growing spectrum of late neurobiological sequelae associated with ACEs (Teicher et al., 2016). Childhood trauma may compromise the development of neural substrates that provide inhibitory control under stressful conditions (Zhai et al., 2019). Symptoms of trauma have been related to positive gambling expectancies and coping motivations that lead to problematic gambling (Grubbs & Chapman, 2019).

Conclusion

Within a veteran sample, the development of severe GD was associated with a higher prevalence of ACEs. Early exposure to substance abuse and/or mental illness in the household conferred particular risk (Table 1). These findings should be considered preliminary and deserving of evaluation in larger samples with well-matched controls. The value of screening for ACEs in general healthcare samples continues to be debated (Campbell, 2020). Nonetheless, screening for ACEs should be considered during the evaluation of GD and particularly in severe GD. The practical question of course is, what would be the clinical impact of detecting a high ACE burden in those with GD? The nature and timing of ACEs can compromise the development of capacities (e.g., self-regulation, reasoning, and relational capacity; Hambrick et al., 2019) that can affect the ability to engage in treatment. The prevalence of comorbid post-traumatic stress disorder and GD may be higher than previously appreciated (Moore & Grubbs, 2021). Thus, an ACE assessment may justify additional resources or suggest a modification of treatment to optimize outcome in GD.

References

- American Psychiatric Association. (1987). *Diagnostic and statistical manual of mental disorders* (3rd ed., rev.).
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.).
- Blosnich, J. R., & Bossarte, R. M. (2017). Premilitary trauma as a correlate of suicidal ideation among veterans. *Psychiatric Services, 68*(8), 755. <https://doi.org/10.1176/appi.ps.201700186>

Blosnich, J. R., Dichter, M. E., Cerulli, C., Batten, S. V., & Bossarte, R. M. (2014). Disparities in adverse childhood experiences among individuals with a history of military service. *JAMA Psychiatry*, *71*(9), 1041–1048. <https://doi.org/10.1001/jamapsychiatry.2014.724>

Campbell, T. L. (2020). Screening for adverse childhood experiences (ACEs) in primary care: A cautionary note. *JAMA*, *323*(23), 2379–2380. <https://doi.org/10.1001/jama.2020.4365>

Centers for Disease Control and Prevention. (2010). Adverse childhood experiences reported by adults—Five states, 2009. *MMWR: Morbidity and Mortality Weekly Report*, *59*(49), 1609–1613.

Etuk, R., Shirk, S. D., Grubbs, J., & Kraus, S. W. (2020). Gambling problems in US military veterans. *Current Addiction Reports*, *7*(2), 210–228. <https://doi.org/10.1007/s40429-020-00310-2>

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., Koss, M. P., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, *14*(4), 245–258. [https://doi.org/10.1016/s0749-3797\(98\)00017-8](https://doi.org/10.1016/s0749-3797(98)00017-8)

Grubbs, J. B., & Chapman, H. (2019). Predicting gambling situations: The roles of impulsivity, substance use, and post-traumatic stress. *Substance Abuse*, *13*, 1178221819852641. <https://doi.org/10.1177/1178221819852641>

Hambrick, E. P., Brawner, T. W., & Perry, B. D. (2019). Timing of early-life stress and the development of brain-related capacities. *Frontiers in Behavioral Neuroscience*, *13*, 183. <https://doi.org/10.3389/fnbeh.2019.00183>

Horváth, C., & Paap, R. (2012). The effect of recessions on gambling expenditures. *Journal of Gambling Studies*, *28*(4), 703–717. <https://doi.org/10.1007/s10899-011-9282-9>

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *Lancet Public Health*, *2*(8), e356–e366. [https://doi.org/10.1016/s2468-2667\(17\)30118-4](https://doi.org/10.1016/s2468-2667(17)30118-4)

Kausch, O., Rugle, L., & Rowland, D. Y. (2006). Lifetime histories of trauma among pathological gamblers. *American Journal on Addictions*, *15*(1), 35–43. <https://doi.org/10.1080/10550490500419045>

Merrick, M. T., Ports, K. A., Ford, D. C., Afifi, T. O., Gershoff, E. T., & Grogan-Kaylor, A. (2017). Unpacking the impact of adverse childhood experiences on adult

- mental health. *Child Abuse and Neglect*, *69*, 10–19. <https://doi.org/10.1016/j.chiabu.2017.03.016>
- Moore, L. H., III, & Grubbs, J. B. (2021). Gambling disorder and comorbid PTSD: A systematic review of empirical research. *Addictive Behaviors*, *114*, 106713. <https://doi.org/10.1016/j.addbeh.2020.106713>
- Negriff, S. (2020). ACEs are not equal: Examining the relative impact of household dysfunction versus childhood maltreatment on mental health in adolescence. *Social Science & Medicine*, *245*, 112696. <https://doi.org/10.1016/j.socscimed.2019.112696>
- Poole, J. C., Kim, H. S., Dobson, K. S., & Hodgins, D. C. (2017). Adverse childhood experiences and disordered gambling: Assessing the mediating role of emotion dysregulation. *Journal of Gambling Studies*, *33*(4), 1187–1200. <https://doi.org/10.1007/s10899-017-9680-8>
- Scherrer, J. F., Xian, H., Kapp, J. M., Waterman, B., Shah, K. R., Volberg, R., & Eisen, S. A. (2007). Association between exposure to childhood and lifetime traumatic events and lifetime pathological gambling in a twin cohort. *Journal of Nervous and Mental Disease*, *195*(1), 72–78. <https://doi.org/10.1097/01.nmd.0000252384.20382.e9>
- Stefanovics, E. A., Potenza, M. N., & Pietrzak, R. H. (2017). Gambling in a national U.S. veteran population: Prevalence, socio-demographics, and psychiatric comorbidities. *Journal of Gambling Studies*, *33*(4), 1099–1120. <https://doi.org/10.1007/s10899-017-9678-2>
- Teicher, M. H., Samson, J. A., Anderson, C. M., & Ohashi, K. (2016). The effects of childhood maltreatment on brain structure, function and connectivity. *Nature Reviews: Neuroscience*, *17*(10), 652–666. <https://doi.org/10.1038/nrn.2016.111>
- Welte, J. W., Tidwell, M. C., Barnes, G. M., Hoffman, J. H., & Wieczorek, W. F. (2016). The relationship between the number of types of legal gambling and the rates of gambling behaviors and problems across U.S. states. *Journal of Gambling Studies*, *32*(2), 379–390. <http://www.ncbi.nlm.nih.gov/pubmed/26050148> (Not in File)
- Zhai, Z. W., Yip, S. W., Lacadie, C. M., Sinha, R., Mayes, L. C., & Potenza, M. N. (2019). Childhood trauma moderates inhibitory control and anterior cingulate cortex activation during stress. *Neuroimage*, *185*, 111–118. <https://doi.org/10.1016/j.neuroimage.2018.10.049>

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For correspondence: George Eugene Jaskiw, M.D., Veterans Affairs - Northeast Ohio Healthcare System, Department of Psychiatry (room 116A), 10701 East Blvd, Cleveland, Ohio, 44106-1702, United States.

E-mail: gxj5@case.edu

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