Conduct Disorder and Alcohol Use Disorder Trajectories, Predictors, and Outcomes for Indigenous Youth

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Objective: The aim of this study was to identify separate and joint trajectories of conduct disorder (CD) and alcohol use disorder (AUD) *DSM-IV* diagnostic symptoms among American Indian and First Nation (Indigenous) youth aged 10 to 18 years, and to characterize baseline profiles and later outcomes associated with joint trajectory group membership.

Method: Data were collected between 2002 and 2010 on three indigenous reservations in the northern Midwest and four Canadian reserves (N = 673). CD and substance use disorder (SUD) were measured using the *DSM-IV* Diagnostic Interview Schedule for Children–Revised (DISC-R), administered at four time points.

Results: Using group-based trajectory modeling, three CD and four AUD trajectories were found. Both had a small group with high symptoms, but the largest groups for both had no symptoms (55% and 73%, respectively). CD symptom trajectories began at age 10 years and peaked at age 14; AUD trajectories began at age 12 years and were highest from age 16 on. Eight joint trajectories were identified. Of the sample, 53% fell into the group with no CD or AUD symptoms. Compared to symptomatic groups, this group had greater caretaker warmth, positive school adjustment, less discrimination, and fewer deviant peers, and were less likely to have a caretaker with major depression at baseline. Symptomatic groups had higher odds of high school dropout, sex under the influence, and arrest at age 17 to 20 years.

Conclusion: Despite significant risk factors, a large proportion of Indigenous youth had no CD–SUD symptoms over time. CD–SUD symptoms have multiple development trajectories and are related to early developmental risk and later psychosocial outcomes.

Key words: alcohol use disorder, conduct disorder, American Indian, First Nations, comorbidity

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Conduct disorder (CD), characterized by rule-breaking and aggressive behavior, is associated with a variety of negative individual and societal outcomes, including earlier initiation of alcohol use and higher rates of alcohol use disorder (AUD).[1-3] Past-year prevalence of CD was 5.4% in the school-based National Comorbidity Survey Replication–Adolescent Supplement (NCS-A),[4] a sample that was 56% non-Hispanic white, and included adolescents aged 13 to 17 years. Although CD can develop into adult antisocial personality disorder, many individuals' CD behaviors dissipate as they enter adulthood, and others have emphasized the importance of distinguishing between adolescent-limited versus life course-persistent antisocial behavior groups.[5]

In general population surveys, higher rates of CD have been reported in racial/ethnic minority groups and those from lower socioeconomic (SES) backgrounds.[2,6] Early environmental factors that predict CD at ages 14 to 16 years include low SES, childhood adversity, parental substance use disorder (SUD), negative home environment, and delinquent peers.[7] American Indian (AI) and other Indigenous youth are disproportionately exposed to these poverty- and family adversity–related risks,[8] in large part due to current and historical factors (e.g., forced relocation, boarding schools, social marginalization), and thus may be particularly at risk for CD and related negative outcomes. In the longitudinal study of AI and First Nation (hereafter "Indigenous") adolescents that forms the basis of this article, risk factors for CD at age 14 years included concurrent discrimination, delinquent peers, and prior CD or oppositional defiant disorder (ODD) diagnosis.[9] Higher rates of incarceration, biases in diagnosis, and poorer access to mental health treatment compound these racial and ethnic disparities.[10]

Despite their greater exposure to CD risk factors, AI youth have not been found to have substantially elevated CD rates compared to other youth. For example, in the Great Smoky Mountain Study, white and Cherokee youth aged 9 to 13 years in Appalachia had similar 3-month prevalence rates of CD or ODD (6.5% Cherokee; 5.3% white).[8] Among Northern Plains AI adolescents, the 6-month prevalence of CD was 3.8% between ages 14 and 17 years and did not differ significantly from a general population sample.[11] In the present sample, past-year prevalence of CD has been reported to peak at age 14 years at 15.7% and decrease to 1.3% by age 18 years.[12]

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Supplemental material cited in this article is available online.

Conduct disorder is most commonly paired with other externalizing disorders, particularly SUD.[11,13] This comorbidity is considered to be a reflection of underlying aspects of CD and SUD, such as the prominence of disinhibition.[14] Both disorders are classified under the umbrella of externalizing disorders, and there is evidence that they have a shared genetic liability.[15] Furthermore, within the externalizing spectrum model, comorbid disorder presentation is associated with higher severity, poorer treatment response, and more negative outcomes.[16,17]

No study has examined how these disorders unfold together over the key developmental period of adolescence. This study fills that gap by considering joint trajectories of CD and SUD comorbidity (and, more specifically, AUD)—or lack thereof—among Indigenous individuals aged 10 to 18 years. Based on diagnostic symptom counts, we used group-based trajectory modeling to determine trajectory groups of comorbid CD and AUD (i.e., taking into account both CD and AUD symptom development over time), to identify risk factors that prospectively predict trajectory group membership, and to characterize their associated age-18 outcomes. We focused on AUD symptoms because Indigenous adults have higher rates of AUD and alcohol-related consequences than other racial and ethnic groups,[18] yet lower and/or similar rates of alcohol use.[19]

METHOD

Participants and Procedure

These data were collected as part of a longitudinal study on three reservations in the northern Midwest and four Canadian reserves between 2002 and 2010. The project was designed in partnership with the participating reservations and reserves. Before the application funding, the research team was invited to work on these reservations, and tribal resolutions were obtained. The university institutional review board also approved all procedures. At each participating location, an advisory board was appointed by the tribal council to provide guidance and oversight of the research process, including review of publications. Data from one reservation are not included because that location did not have an active advisory board, and we wanted to respect the community's right to review research prior to publication.

Each of the participating reservations and reserves provided a list of families of tribally enrolled individuals aged 10 to 12 years who lived on or within 50 miles of the reservation or reserve. We attempted to contact all families with a child in the specified age range through a visit by an Indigenous interviewer. Families were presented with a traditional gift and invited to participate. For those families that participated, each family member received $40. The recruitment procedure resulted in an overall response rate of 79.4%.

Eight waves of data were collected via yearly interviews with the adolescent and at least one primary caretaker. For these analyses, we used Waves 1, 4, 6, and 8, when diagnostic data were collected, and aligned participants by their age at each wave. The present study includes the 673 adolescents who completed baseline (Wave 1) diagnostic interviews (mean age [SD] = 11.1 [0.82] years; 50.3% female). Approximately 11% lived in a remote location (compared to a rural location), and 85.5% lived on a reservation/reserve. Average annual per capita family income was $5,448, and median parent education level was high school diploma or general equivalence diploma (GED). Retention rates were high across the 8 years of the study, with 87.7% retention at Wave 4, 88% at Wave 6, and 78.5% at Wave 8. Additional details regarding the sample and study methodology are available in Whitbeck *et al.*[12]

Measures

CD and AUD Symptoms. Conduct disorder (CD) symptoms and alcohol use disorder (AUD) symptoms, the focus of the study, were assessed via the *DSM-IV* Diagnostic Interview Schedule for Children–Revised (DISC-R). Trained community interviewers administered the survey. The DISC-R is commonly used for children and adolescents aged 11 years and older.[20,21] For CD, youth reported whether they had engaged in 14 different behaviors (*DSM-IV* criteria specify 15 items, but the question regarding forced sex was not included in our study) in the past year. For AUD, youth were asked a series of questions regarding their use of alcohol in the past year, and 11 symptoms were calculated from their responses to assess abuse and dependence. All symptoms were coded as 0 if the symptom was not present and as 1 if the symptom was present. For each disorder, responses were summed into symptom counts to calculate a continuous severity measure. We used youth-reported symptoms at Waves 1, 4, 6, and 8 to calculate symptom trajectories based on adolescents' age at each wave, as described below. Descriptive statistics for the disorder symptoms at each age are provided in Table S1, available online.

Wave 1 (Ages 10–12) Risk and Protective Factors. Eight predictor variables (Table S2, available online) were included in the profile analysis, all drawn from Wave 1. Adolescent gender was coded 1 = female and 0 = male. Per capita family income was a continuous measure of caretaker-reported household income divided by the number of people living in the household.[22] Caretaker warmth and support was a mean score of adolescent responses to five items assessing how often someone in their family was warm and supportive (0 = none of the time, 1 = some of the time, 2 = all of the time). Positive school adjustment was measured with seven yes/no questions regarding positive attitudes toward school; affirmative responses were summed. Discrimination was assessed with 10 items from an adapted version of the Schedule of Racist Events,[23] measuring how often adolescents experienced negative treatment from others because of their indigenous culture. "Deviant peers" was a summed average of how many of respondents' three best friends engaged in seven behaviors (e.g., drinking, getting into trouble with police). Past-year caretaker major depressive disorder (MDD) and SUD were assessed using the University of Michigan Composite International Diagnostic Interview[24] to determine whether any primary caretakers met criteria for past-year MDD or alcohol abuse, drug abuse, or alcohol dependence.

Wave 8 (Ages 17–20) Outcomes. Four dichotomous variables (Table S2, available online) were used in the outcome analysis, all drawn from the final wave of the study. These variables included whether adolescents had graduated or were still attending high school, reported early parenthood (i.e., had a child during the study), had sex under the influence (i.e., engaged in sex in the past year while under the influence of drugs or alcohol), or were arrested in the past year. All variables were coded as present (1) or absent (0).

Data Analyses

Group-based trajectory modeling using Stata *traj* was used to identify clusters of adolescents following similar patterns over time for CD and AUD symptoms.[25,26] Because symptom counts were used, zero-inflated Poisson distributions were specified. We began by modeling CD and AUD symptoms separately to select the appropriate number and shape of trajectory groups. Model selection