The Clinical Course of DSM-5 Alcohol Use Disorders in Young Adult Native and Mexican Americans

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Background and Objectives: To determine if the clinical course of DSM-5 alcohol use disorders (AUD) in select populations of young adults (18–30 years) differed based on gender, diagnostic severity (mild, moderate, severe), and ethnicity.
Methods: Native Americans (NA) and Mexican Americans (MA) ($n = 1,129$) were recruited from the community and completed a structured diagnostic interview. Participants with DSM-5 AUDs were compared based on gender, severity of the disorder (mild, moderate, severe), and ethnicity for differences in drinking levels, as well as the clinical course of AUD as defined by the occurrence and sequence of 36 alcohol-related life events.
Results: Seventy percent of the NA men, 64% of the NA women, 56% of the MA men, and 42% of the MA women met lifetime diagnostic criteria for a DSM-5 AUD. NA reported more alcohol-related life events and at an earlier age than MA. A high degree of similarity in the clinical course was found between men and women and between those with severe or moderate disorder, but not with those with mild disorder.
Conclusions: NA had higher drinking levels and more alcohol problems at an earlier age than MA. A similar clinical course was seen based on gender and ethnicity in these young adults, but not based on diagnostic severity.
Scientific Significance: The DSM-5 mild AUD category differs from the moderate and severe categories on drinking history, clinical course, gender, and ethnic distribution. Mild AUD may not be in the same clinical continuum as moderate and severe AUD in these populations. (Am J Addict 2015;24:713–721)

INTRODUCTION

Jellinek[1] first published a description of the course of alcoholism and suggested that alcohol-related problems progressed in an orderly sequence from psychological to physical addiction, while cautioning that not everyone would experience all of the symptoms in the same order over time.

Schuckit et al.,[2] using a structured personal interview, further advanced the description of the clinical course of alcoholism based on the relative order of appearance of major alcohol-related events. This approach had the advantage of allowing the recording of the events in a more objective and verifiable manner than those originally described by Jellinek.[1] In a series of articles, Schuckit et al.[2–4] reported a high level of similarity in the clinical course of alcoholism across a number of subgroups of alcoholics (eg, inpatients vs. outpatients, males vs. females, presence vs. absence of family history of alcohol dependence, secondary diagnoses). These findings have also been replicated in another large, mostly EuroAmerican national study, The San Francisco Family Study.[5] These studies strengthen the construct that alcoholism is a disease with a distinct and predictable clinical course.

The clinical course of alcoholism has also been investigated in some minority communities. The clinical course of alcoholism was investigated in the Navaho[6] using an instrument based on Jellinek's criteria. Ehlers et al.[7] and Malcolm et al.[8] investigated the clinical course of alcoholism using Schuckit's instrument in a population of Native Americans/Alaska Natives and found a substantially similar clinical course to that of the participants described by Schuckit et al.,[3] who were in the Collaborative Study for the Genetics of Alcoholism. Scott et al.[9] evaluated the clinical course of alcoholism in a population of African Americans using the same criteria, and also verified that the clinical course was similar to that reported by Schuckit et al.,[3] as did Montane-Jaime et al.[10] who evaluated Trinidadians of African and East Indian descent. However, although each of these populations showed substantially the same order and progression of alcohol-related life events, there were ethnic differences in the ages of onset, endorsement rates of individual alcohol-related life events, and the length of time from the occurrence of the first life event to the development of severe problems. There have been no reports that have evaluated the clinical course of alcoholism in Hispanic groups or in young adults of any ethnicity. Additionally, there has not been an analysis comparing the clinical course of alcoholism using the recent DSM-5 alcohol use disorder (AUD) criteria thresholds of mild, moderate, and severe.

Knowing whether the clinical course of AUDs differs depending on ethnicity is important for several reasons. Familiarity with the clinical course of a disorder, especially in young adults when heavy drinking and the early onset of symptoms may be first occurring, can lead to early recognition of the disease, better prognosis of the disorder, and may help to guide the timing of prevention and intervention strategies. On the other hand, if some symptoms are relatively "benign" and do not lead to further morbidity, then "labeling" individuals with a diagnosis of disease may over-estimate disease prevalence and lead to stigmatization of individuals and communities. Although use of alcohol varies among tribes, as a whole, Native Americans suffer high rates of alcohol and drug dependence, and higher alcohol-related death rates than any other US ethnic group.[7,11–18] Hispanics are heterogeneous in national origin, and have a range of AUDs among different Hispanic national groups.[19] Drinking by some Hispanics and Native Americans has also been reported to result in higher cirrhosis mortality rates than other ethnic populations.[20,21] Therefore, studying the clinical course of AUD in Mexican and Native Americans is important in order to address health disparities.

The present report is part of a larger study exploring risk factors for substance dependence among Native Americans and Mexican Americans residing in southwest California.[7,13,22–27] The purpose of the present set of analyses was to investigate (i) the prevalence of, and levels of drinking (quantity and frequency) in the three DSM-5 AUDs (mild, moderate, severe) in the two populations evaluated and (ii) the clinical course of AUD as defined by the age of onset, occurrence, sequence, and progression of 36 alcohol-related life events, in non-treatment seeking young adult Mexican and Native American males and females. Additionally, we evaluated whether the sequence of occurrence of these AUD-associated life events differed depending on whether the individual had a diagnosis of mild, moderate, or severe AUD. Our hypothesis, based on previous studies in these populations, was that a substantially similar clinical course of alcoholism (as defined by the order and progression of the alcohol-related life events in the SSAGA) would be seen between the two ethnicities. However, we further predicted that the Native Americans would present with more severe AUDs, heavier drinking levels, and earlier ages of onset of symptomatology.

METHODS

Participants

The participants were individuals of Native American (NA) and Mexican American (MA) descent that were recruited from the local community for larger studies investigating risk factors for substance dependence in these two ethnic groups. The NAs were recruited from eight geographically contiguous reservations with a total population of about 3,000 individuals, as described previously.[7,22] NA participants were recruited in a wide age range (18–85 years), however, the present set of analyses focused on only those individuals who were between 18 and 30 years of age at the time of interview. The MA participants were recruited using a commercial mailing list of Hispanic surnames. The mailed invitation stated that potential participants must be of MA heritage, be between the ages of 18 and 30 years, be residing in the United States legally, and be able to read and write in English. This recruitment strategy yielded primarily second generation (60%) immigrants. Based on the aims of the larger studies, for both ethnic groups, participants were excluded if they were pregnant, nursing, or currently had a major medical disorder that precluded them traveling to the research site. Participants were asked to refrain from alcohol or recreational drug use for 24 hours prior to testing, and their breathalyzer blood alcohol levels had to be .00 g/dl to be included in the study. The protocol for the study was approved by the Institutional Review Board of The Scripps Research Institute and Indian Health Council for the tribes participating. Written informed consent was obtained from each participant after the study was fully explained.

Each participant also completed a face-to-face interview with the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA)[28] which collected information including demographics, psychiatric history, and symptoms of substance use disorders. Diagnoses of lifetime DSM-5 AUDs (mild, moderate, or severe) were generated using the SSAGA, with all best final diagnoses made by a research psychiatrist/addiction specialist (DAG).[29] In addition, the interview retrospectively asks about the occurrence of alcohol-related life events, and the age at which the problem first occurred. A lifetime drinking history was also collected, beginning with the participant's onset of regular drinking, their heaviest drinking periods, and ending with the current drinking pattern. This instrument allows for a retrospective description of alcohol use over the entire lifetime, with different drinking phases defined in terms of changes in quantity or frequency of drinking.[30]

Differences between demographic variables in the two ethnic groups for the three diagnostic categories were analyzed using ANOVA for continuous variables and Fisher's exact test for dichotomous variables, with significance set at $p < .01$. Statistics for ethnic and gender differences (controlling for age and years of education) in the incidence of DSM-5 AUD mild (2–3 symptoms), moderate (4–5 symptoms), and severe (≥ 6 symptoms) in these populations were also conducted using multinomial logistic regression, followed by planned comparisons of the subgroups ($p < .01$). We also investigated the quantity and frequency of drinking in the diagnostic subgroups based on gender and ethnicity. For the drinking data, multivariate analysis of variance (controlling for age and education) was used followed by planned comparisons. For these analyses significance was set at $p < .001$.

The clinical course of alcoholism within the NA and MA young adult populations was investigated using the methods described by Schuckit et al.[2–4] and Ehlers et al.,[5,7] using 36 alcohol-related life events derived from the SSAGA. We

investigated gender effects within each population as well as a comparison of the two ethnic groups. To be entered into these two sets of analyses, an individual had to at least meet criteria for DSM-5 AUD, mild category (≥ 2 symptoms during the same 12-month period). We also evaluated whether the clinical course differed depending on the individual's severity of diagnosis (mild, moderate, severe). For all three of these sets of analyses, the age at first occurrence of the sequence of alcohol-related life events were compared for the subgroups (men vs. women, NA vs. MA, AUD severity) using Spearman's rank order correlation (rho). For these analyses, each event is assigned a number based on the order of its appearance in time for all 36 events for each subgroup and the Spearman rank correlation is computed. An analysis of how many participants endorsed individual items and whether they differed based on subgroup was evaluated using the chi-square test. The analysis of whether the age of occurrence of each of the items differed, based on subgroup, was evaluated using ANOVA. Significance for all these analyses was set at $p < .001$ (Bonferroni correction).

RESULTS

Data from 619 MAs and 510 NAs were available for these analyses. In both populations, a greater number of females chose to participate in the research project with 646 (57%) of the 1,129 participants being female, although the proportion of females did not differ between the two ethnic groups. Evaluation of the demographic information for the total group of participants revealed that MA participants were older ($M = 23.7$ years, $SD = 3.8$) than the NA participants ($M = 21.7$ years, $SD = 3.8$), $F(1, 1,127) = 71.9$, $p < .001$; had more years of education ($M = 13.4$, $SD = 1.8$) than NA participants ($M = 11.5$, $SD = 1.3$), $F(1, 1,126) = 390.4$, $p < .001$; were more likely to earn more than $20,000 a year, $\chi^2(1) = 49.4$, $p < .0001$; were more likely to be married $\chi^2(1) = 22.8$, $p < .0001$; more likely to be employed $\chi^2(1) = 72.5$, $p < .0001$, and were less likely to have a family history of alcoholism $\chi^2(1) = 112.8$, $p < .0001$, than the NA participants (data not shown).

Six hundred thirty-four of the total sample of 1,129 participants (56%) met the criteria for a lifetime DSM-5 diagnosis of AUDs: mild ($n = 254$; 22%), moderate ($n = 159$; 14%), or severe ($n = 221$; 20%). A comparison of demographic information between those participants with AUD and those with no AUD revealed that a significantly larger proportion of the men had an AUD ($n = 301$; 62%) than the women ($n = 333$; 52%), $\chi^2(1) = 13.0$, $p < .0001$. Those participants with AUD were also more likely to be older (no AUD $M = 22.2$ years, $SD = 3.9$; AUD $M = 23.2$ years, $SD = 3.9$), $F(1, 1,126) = 18.8$, $p < .001$; have fewer years of education (no AUD $M = 12.8$, $SD = 1.8$; AUD $M = 12.4$, $SD = 1.9$), $F(1, 1,126) = 10.7$, $p < .001$; were more likely to earn less than $20,000/year, $\chi^2(1) = 6.6$, $p = .01$, and were more likely to have a family history of alcoholism $\chi^2(1) = 60.5$, $p < .0001$. There were no differences in marital status (married vs. not married) or employment status (employed vs. not employed) between those participants with AUDs and those without (data not shown).

Table 1 presents the number and percentage of individuals exclusively in each AUD category by gender and ethnicity. A

TABLE 1. Number and percentage of DSM-5 alcohol use disorders (AUD) according to gender and ethnicity

	No AUD	Mild AUD	Moderate AUD	Severe AUD
Mexican Americans				
Males	111 (44%)	66 (26%)	39 (15%)	38 (15%)
Females	211 (58%)	88 (24%)	34 (9%)[a]	32 (9%)[b]
Total	322 (52%)	154 (25%)	73 (12%)	70 (11%)
Native Americans				
Males	71 (31%)	46 (20%)	47 (21%)	65 (28%)[c]
Females	102 (36%)	54 (19%)[d]	39 (14%)[e]	86 (31%)[f]
Total	173 (34%)	100 (20%)	86 (17%)[g]	151 (30%)[h]
All participants combined				
Males	182 (38%)	112 (23%)	86 (18%)	103 (21%)
Females	313 (48%)	142 (22%)	73 (11%)[i]	118 (18%)
Total	495 (44%)	254 (22%)	159 (14%)	221 (20%)

The numbers and percentages of DSM-5 alcohol use disorders (AUD) are presented according to gender and ethnicity in Mexican American (MA) and Native American (NA) participants separately, as well as all participants combined. The *p*-values reported are Fisher's exact for dichotomous variables with significance set at ($p < .01$).

[a] $p < .01$ Comparing moderate AUD category versus no AUD category for gender in MAs.; [b] $p < .01$ Comparing severe AUD versus no AUD category for gender in MAs.; [c] $p < .01$ Comparing MA males to NA males in the severe AUD category.; [d] $p < .01$ Comparing MA females to NA females in the mild AUD category.; [e] $p < .01$ Comparing MA females to NA females in the moderate AUD category.; [f] $p < .01$ Comparing MA females to NA females in the severe AUD category.; [g] $p < .01$ Overall ethnicity effect in the moderate AUD category.; [h] $p < .01$ Overall ethnicity effect in the severe AUD category.; [i] $p < .01$ Comparing moderate AUD category versus no AUD category for gender in all participants combined.

multinomial logistic regression that controlled for age and years of education was used to determine if the diagnostic categories differed by gender or ethnicity from those individuals with no AUDs. The proportion of individuals in the DSM-5 mild category did not differ by race or gender, whereas the moderate category was significantly different for both ethnicity (Wald = 17.5, $p < .0001$) and gender (Wald = 14.1, $p < .0001$), with NAs having more use disorders than MAs and men having more use disorders than women. In the severe category, ethnicity (Wald = 47.7, $p < .0001$), but not gender, was significant with NAs having more use disorders than MAs. Post hoc analyses were conducted, using Fisher's exact test, in order to identify the gender differences in the moderate and severe diagnostic categories within the two ethnic groups and between the two ethnic groups, as seen in Table 1. Within the MAs, there were more men in the moderate and severe categories than women, but no significant gender differences were seen in the NAs. A comparison between the two ethnicities revealed that there were more NA males with severe AUD than MA males, and there were more NA females with moderate and severe AUD than MA females.

Table 2 presents the quantity (drinks per occasion) and frequency (drinking days per month) of drinking for individuals in each AUD category (mild, moderate, severe) during their self-reported heaviest drinking period, by gender (M vs. F) and ethnicity (MA vs. NA). A MANOVA which controlled for age and education showed significant effects of DSM-5 AUD category $F(3, 1,015) = 37.2$, $p < .0001$, and ethnicity $F(1, 1,015) = 22.5$, $p < .0001$, on drinking quantity. Post hoc ANOVA found that individuals in the NA sample drank significantly more per occasion, during their heaviest drinking period, in the no AUD category $F(1, 403) = 26.1$,

$p < .0001$, as well as in each AUD category: mild $F(1, 249) = 23.5$, $p < .0001$; moderate $F(1, 156) = 17.2$, $p < .0001$; and severe $F(1, 218) = 13.4$, $p < .0001$, as compared to the MAs. A MANOVA evaluating drinking frequency (controlling for age and education) showed significant effects of DSM-5 AUD category $F(3, 1,011) = 147.2$, $p < .0001$, and ethnicity $F(1, 1,011) = 12.1$, $p = .001$, but no effect of gender and no interactions.

A comparison of alcohol-related life experiences and their occurrence in time was made between male and female participants in both the NA and MA sample. A high level of similarity was observed between the two genders in the sequence of the progression of problems in both the NAs (Spearman's rho = .75, $p < .0001$) and the MAs (Spearman's rho = .72; $p < .0001$). A high level of similarity was also observed between the two ethnic groups in the sequence of the progression of alcohol-related life problems (Spearman's rho = .69; $p < .0001$). These analyses were also conducted in order to determine if the clinical course differed based on diagnostic subgroup. A significant degree of similarity in the sequence of the progression of alcohol-related problems was found when the DSM-5 moderate AUD group was compared to the severe group (Spearman's rho = .66, $p < .0001$); however, the correlations between the moderate group versus the mild group and the severe group versus the mild group were not significant.

Reported age of onset and the number of persons endorsing individual items in the progression of alcohol-related life problems were also evaluated for associations with gender and ethnicity and the results for ethnicity are presented in Table 3. There were no significant differences based on gender in the age of onset of each symptom in either the NA or the MA

TABLE 2. Drinking quantity (Q) and frequency (F) according to gender, ethnicity, and DSM-5 alcohol use disorder (AUD) category

	No AUD (M ± SE)		Mild AUD (M ± SE)		Moderate AUD (M ± SE)		Severe AUD (M ± SE)	
	Q	F	Q	F	Q	F	Q	F
Mexican Americans ($n = 566$; males = 232, females = 328)								
Males	5.2 ± 0.4	4.6 ± 0.7	7.9 ± 1.0	7.2 ± 0.9	9.6 ± 1.4	15.3 ± 1.6	12.5 ± 1.6	15.2 ± 1.5
Females	4.1 ± 0.3	3.6 ± 0.3	5.1 ± 0.4	7.3 ± 0.6	6.6 ± 0.7	12.4 ± 1.4	9.1 ± 1.5	18.6 ± 1.8
Total	4.4 ± 0.2	4.0 ± 0.3	6.3 ± 0.5	7.3 ± 0.5	8.2 ± 0.8	13.9 ± 1.1	10.9 ± 1.1	16.7 ± 1.1
Native Americans ($n = 470$; males = 211, females = 259)								
Males	7.2 ± 1.0	5.4 ± 0.9	11.7 ± 1.1	9.5 ± 1.4	16.0 ± 1.4	15.6 ± 1.3	18.4 ± 1.4	19.0 ± 1.3
Females	7.1 ± 0.8	3.8 ± 0.5	10.0 ± 1.3	10.5 ± 1.2	10.2 ± 1.0	15.4 ± 1.6	20.4 ± 2.4	21.0 ± 1.0
Total	7.1 ± 0.6*	4.5 ± 0.4	10.8 ± 0.9*	10.0 ± 0.9	13.4 ± 0.9*	15.5 ± 1.0	19.5 ± 1.5*	20.1 ± 0.8
All participants ($n = 1034$; males = 443, females = 587)								
Males	5.9 ± 0.5	4.9 ± 0.5	9.4 ± 0.7	8.1 ± 0.8	13.1 ± 1.0	15.5 ± 1.0	16.2 ± 1.1	17.6 ± 1.0
Females	5.0 ± 0.3	3.7 ± 0.3	7.0 ± 0.6	8.5 ± 0.6	8.5 ± 0.6	14.0 ± 1.1	17.3 ± 1.9	20.4 ± 0.9
Total	5.3 ± 0.3	4.2 ± 0.3	8.0 ± 0.5	8.4 ± 0.5	11.0 ± 0.7	14.8 ± 0.7	16.8 ± 1.1	19.1 ± 0.7

Drinking quantity (drinks per occasion) and drinking frequency (drinking days per month) variables are presented as mean values ± standard error (SE) in Mexican American (MA) participants, Native American (NA) participants, and all participants combined. The p-values reported are for analysis of variance (ANOVA) with significance set at ($p < .001$).

*$p < .001$ Native American versus Mexican American drinking quantity in the no AUD, mild AUD, moderate AUD, and severe AUD categories.

TABLE 3. The clinical course of alcoholism in young adult Native American and Mexican American participants

	Native American participants who experienced event (n, %)	Mexican American participants who experienced event (n, %)	Significant difference in proportion experiencing the event between NA and MA	Age at which event first occurred in Native Americans (M ± SD)	Age at which event first occurred in Mexican Americans (M ± SD)	Significant difference in age that the event occurred between NA and MA
Problems at work/school	111 (32.9)	58 (19.5)		16.9 ± 2.7	18.4 ± 2.7	NA < MA
Blackouts	240 (71.2)	197 (66.3)		16.9 ± 2.9	18.4 ± 3.0	NA < MA
Arguments	264 (78.3)	180 (60.6)	NA > MA	17.0 ± 2.6	18.8 ± 2.9	NA < MA
Lost friends	60 (17.8)	25 (8.4)		17.2 ± 3.0	19.0 ± 3.3	NA < MA
Hit/threw things	186 (55.2)	92 (31.0)	NA > MA	17.2 ± 2.9	19.0 ± 3.2	NA < MA
Hitting others without fighting	89 (26.4)	51 (17.2)		17.4 ± 3.0	19.2 ± 3.1	NA < MA
Physical fights	209 (62.0)	104 (35.0)	NA > MA	17.4 ± 2.9	18.9 ± 3.0	NA < MA
Hit family member	74 (22.0)	23 (7.7)	NA > MA	17.4 ± 3.2	18.2 ± 3.0	
Drank when not intended	180 (53.4)	159 (53.5)		17.4 ± 3.1	18.0 ± 2.5	
Problems with family, friends	169 (50.2)	93 (31.3)	NA > MA	17.5 ± 3.3	18.6 ± 3.3	
Objections from family and friends	232 (68.8)	158 (53.2)		17.6 ± 3.4	18.9 ± 3.2	NA < MA
Drank while in hazardous situations	214 (63.5)	207 (69.7)		17.7 ± 2.8	19.0 ± 2.7	NA < MA
Interfered with work responsibilities	131 (38.9)	64 (21.6)		17.8 ± 3.0	18.7 ± 2.9	
Drank more than intended	266 (78.9)	226 (76.1)		17.9 ± 3.3	18.7 ± 3.1	
Morning drinking	182 (54.0)	116 (39.1)	NA > MA	17.9 ± 3.3	20.0 ± 3.6	NA < MA
Binges	201 (59.6)	88 (29.6)	NA > MA	18.0 ± 2.8	18.8 ± 3.0	
Decreased important activities	106 (31.5)	45 (15.2)	NA > MA	18.0 ± 3.3	18.7 ± 3.2	
Little time for non-drinking activities	124 (36.8)	77 (25.9)		18.0 ± 2.8	19.7 ± 3.1	NA < MA

(*Continued*)

TABLE 3. Continued

	Native American participants who experienced event (n, %)	Mexican American participants who experienced event (n, %)	Significant difference in proportion experiencing the event between NA and MA	Age at which event first occurred in Native Americans (M ± SD)	Age at which event first occurred in Mexican Americans (M ± SD)	Significant difference in age that the event occurred between NA and MA
Self-injury while drunk	146 (43.3)	119 (40.1)		18.0 ± 3.3	19.4 ± 3.4	NA < MA
Arrested for alcohol-related behavior	69 (20.5)	35 (11.8)		18.1 ± 2.8	18.6 ± 3.7	
Inability to change drinking behavior	93 (27.6)	34 (11.5)	NA > MA	18.1 ± 2.8	18.5 ± 2.8	
Tolerance	270 (80.1)	233 (78.5)		18.1 ± 2.9	19.2 ± 2.8	NA < MA
Psychological impairment	99 (29.4)	52 (17.5)		18.2 ± 2.9	18.9 ± 3.2	
Used rules for drinking	96 (28.5)	77 (25.9)		18.4 ± 3.1	20.1 ± 3.5	NA < MA
Strong desire for alcohol	92 (27.3)	48 (16.2)		18.5 ± 3.3	19.5 ± 3.3	
Unable to quit/cut down	112 (33.2)	76 (25.6)		18.5 ± 3.0	20.8 ± 3.2	NA < MA
Guilt	145 (43.0)	102 (34.3)		18.6 ± 3.4	19.9 ± 3.2	
Sought professional help	61 (18.1)	46 (15.5)		18.6 ± 3.4	20.1 ± 3.4	
Wanted to quit 3+ times	207 (61.4)	173 (58.3)		18.7 ± 3.0	20.2 ± 3.2	NA < MA
Shakes	72 (21.4)	31 (10.4)		18.7 ± 3.5	20.5 ± 3.6	
Considered self-excessive drinker	164 (48.7)	116 (39.1)		18.7 ± 3.2	19.7 ± 3.0	
Problems in love relationship	101 (30.0)	61 (20.5)		18.7 ± 2.9	20.0 ± 2.9	
Withdrawal	93 (27.6)	43 (14.5)		19.0 ± 3.3	20.3 ± 3.2	
Health problems occurred	65 (19.3)	37 (12.5)		19.2 ± 3.5	20.6 ± 4.0	
Arrested for drunk driving	86 (25.5)	78 (26.3)		19.9 ± 3.3	21.2 ± 3.5	

(Continued)

TABLE 3. Continued

	Native American participants who experienced event (n, %)	Mexican American participants who experienced event (n, %)	Significant difference in proportion experiencing the event between NA and MA	Age at which event first occurred in Native Americans (M ± SD)	Age at which event first occurred in Mexican Americans (M ± SD)	Significant difference in age that the event occurred between NA and MA
Continued despite health problems	36 (10.7)	24 (8.1)		19.9 ± 3.6	18.8 ± 2.6	

The clinical course of alcoholism is shown by the temporal sequence of 36 alcohol-related life events for young adult Native Americans (NA) with DSM-5 alcohol use disorder (≥2 symptoms), and a comparison with young adult Mexican Americans (MA) with DSM-5 alcohol use disorder. An analysis of how many participants experienced each event in Native Americans compared to Mexican Americans was evaluated using the chi-square test. An analysis of age at which the event first occurred in Native Americans compared to Mexican Americans was evaluated using analysis of variance. Significances ($p < .001$) and their direction (eg, NA > MA) are indicated.

sample. In the MA sample, men were more likely to endorse "bingeing" (being drunk for 2 days or more), $\chi^2(1) = 10.3$, $p < .001$, and "being involved in alcohol-related physical fights," $\chi^2(1) = 15.0$, $p < .001$, than the women. In the NA sample, women were more likely to endorse decreasing important activities in order to drink, $\chi^2(1) = 10.4$, $p < .001$, as compared to men. As seen in Table 3, there were also significant differences between the MA and NA groups in the age of onset of each alcohol-related life symptom and the number of persons endorsing individual items. Native Americans had a significantly earlier age of onset for 15 of the 36 alcohol-related life symptoms as compared to the Mexican Americans. A comparison of the endorsement levels of the individual alcohol-related life events revealed that NAs were significantly more likely than the MAs to report that their alcohol use was associated with the following problems: "hit a family member," $\chi^2(1) = 11.6$, $p < .001$; "an inability to change drinking behavior," $\chi^2(1) = 12.1$, $p < .001$; "problems with family and friends," $\chi^2(1) = 10.8$, $p < .001$; "decreased important activities," $\chi^2(1) = 10.9$, $p < .001$; "bingeing," $\chi^2(1) = 26.9$, $p < .001$; "arguments," $\chi^2(1) = 11.1$, $p < .001$; "physical fights," $\chi^2(1) = 21.6$, $p < .001$; and "hit or threw things," $\chi^2(1) = 17.7$, $p < .001$.

DISCUSSION

Evaluation of the clinical course of alcoholism, as defined by the order and progression of alcohol-related life events, has demonstrated that EuroAmericans, African Americans, and Native Americans/Alaska Natives have a significantly similar clinical course of the disorder, although ethnic differences in the age of onset and endorsement rates of certain individual life events have been reported previously.[8–10,22] In two studies, one in a Native American community sample[2] and one in Alaska Natives seeking treatment,[8] the alcohol-related symptoms assessed, although occurring in the same order, appeared to develop at an earlier age and the time from the appearance of the first symptom and seeking help for those problems was shorter than what had been reported in the COGA study of primarily EuroAmericans. In another study, in the Navaho, the progression of 46 alcohol-related life events, as described by Jellinek,[1] were evaluated in a group of 99 inpatients in an alcohol-detoxification center.[6] In that study, the progression of alcohol-related symptoms was found to be only modestly correlated with other studies of alcoholics and only for men and not for women. Such findings may indicate that there are tribal differences in the clinical course of alcoholism. However, the Navajo study also used a different instrument than the two other studies in Native Americans/Alaska Natives who used the instrument developed by Schuckit et al.[2] The present study used the instrument developed by Schuckit et al.[2] and is the first to evaluate the clinical course of AUDs in young adults and in individuals of Hispanic heritage. This is also the first study to evaluate the clinical course of AUDs

using DSM-5 criteria to define thresholds for determining an AUD.

The two populations investigated in this study had different rates of AUDs. Overall the young adult Native American population had a higher percentage of individuals in the moderate and severe AUD categories than the Mexican Americans. Additionally, the Native Americans in this study had higher rates of lifetime AUDs than Native Americans in the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) sample (67% vs. 43%), and the Mexican Americans in this study had higher lifetime rates of AUDs than Hispanics in the NESARC sample (48% vs. 21%).[31] Previous research has shown that US-born Hispanics drink more than Hispanics born abroad, and Mexican Americans have higher rates of AUDs than other Hispanic subgroups.[32] It is important to note that NESARC utilizes a national sample of adults aged 18 and over and was based on DSM-IV diagnoses, whereas this study utilized a sample of 18–30 year olds from one geographic region and was based on DSM-5 diagnoses. There were also significant gender differences in AUD in these select populations with men having higher rates of disorder than women. A range of gender differences has been reported in alcohol dependence rates between American Indian men and women depending on which American Indian tribe is being investigated.[33] In the present study, high levels of drinking and AUDs were found in the Native American women. The gender differences seen among tribes and among other ethnicities could theoretically include genetic risk X gender interactions, differences in cultural norms for drinking behaviors, differences in acculturation, and culturally specific traditional gender roles. It should also be cautioned that the two populations in the present study were ascertained by different recruitment strategies and differed in a number of demographic variables that could have also influenced these findings.

In the present study, we found that the clinical course of AUDs as assessed by the order and progression of 36 alcohol-related life events was significantly similar between men and women and between the Native American and the Mexican American young adults. However, the Native Americans reported that 15 of the 36 life events first occurred at a younger age than did the Mexican Americans. We have previously reported, in this Native American population, that the earlier the age that a person recalled first getting "drunk" the more likely it was that they would have a diagnosis of alcohol dependence.[13] The current study extends those findings and demonstrates that there is also an early appearance of alcohol-related life events in this population that is associated with higher rates of AUDs as compared to the Mexican American sample.

Early recognition of AUDs is important as it has the potential to lead to early and possibly more effective prevention and intervention strategies. DSM-5 AUDs differ from their predecessors in that they no longer include an alcohol abuse category and that they are viewed as a dimensional continuum with mild disorder having 2–3 symptoms, moderate 4–5 symptoms, and severe ≥6 symptoms. However, it is not yet known whether mild disorder is in fact an early stage of moderate/severe disorder or whether it is a distinct category that does not necessarily progress. In the present study, we compared the clinical course of AUD among the three diagnostic categories. We found that mild AUD did not have a significantly similar clinical course as compared to moderate or severe AUD. We also compared drinking levels among the three AUD categories and found that the quantity of drinking did not differ between the no AUD group and the mild AUD group. Although women were found to drink on fewer occasions in the no AUD category than those with mild AUD, there were no differences in drinking frequency between the men in those categories. In addition, there were no gender or ethnic distribution differences in the mild AUD category. Taken together these findings suggest that in these select populations of young adult Mexican and Native Americans, DSM-5 mild AUD differs from moderate and severe AUD on drinking history, clinical course, gender and ethnic distributions. Longitudinal data will be necessary to find out if the mild AUD category is helpful in identifying early signs of the disorder or whether it misclassifies many individuals who do not have the disease.

The results of this study should be interpreted in the context of several other limitations. First, the findings were in young adults and differences may emerge as these individuals age and pass further through the clinical course or remit from the disorder. The results may not generalize to other Mexican Americans, especially those who do not speak English or are not residing legally in the United States as they were excluded from the recruitment strategy. Additionally, the data are from one group of Native Americans and are not necessarily representative of all Native Americans or even all individuals within these populations. The study gathered data on the course of alcoholism using retrospective methods and more information is needed using longitudinal techniques. Despite these limitations, this report represents an important first step in an ongoing investigation of substance use disorders in these high-risk and understudied ethnic groups.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

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