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Prevalence of Alcohol Use: A National Survey of Deaf Adults in the United States

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Background

With an increasingly diverse population, disparities in health are a growing concern for individuals from medically underserved groups, including the deaf and hard of hearing (DHH) population. Health disparities limit quality healthcare improvements that affect members of underrepresented race, ethnicity, socioeconomic, gender, sexual orientation, and disability groups (Ubri & Artiga, 2016). A subgroup of Deaf individuals who use American Sign Language (ASL) is understudied in health research and underserved in health care (Kuenburg, Fellinger, & Fellinger, 2016). The national prevalence of alcohol use among Deaf individuals remains largely unknown.

Alcohol Use Among Deaf Adults

Alcohol has been found to be the most commonly abused substance among American adults (Patrick & Schulenberg, 2013). According to results from the 2016 National Survey on Drug Use and Health with 209,437 adult respondents, about 56% reported that they drank within the past month (Hasin et al., 2016). Slightly more men drank than women. This survey report also identified that lifetime alcohol consumption was highest among Whites, trailed by American Indians, African Americans, and Hispanics. For young to middle-aged women, moderate alcohol consumption (~1 serving daily) had a small improvement in physical health-related quality of life, whereas moderate-to-heavy alcohol consumption was associated with poorer mental health quality of life outcomes (Schrieks et al., 2016). Similar findings regarding the relationship between alcohol consumption and quality of life outcomes were reported in a large adult sample of childhood cancer survivors (Zhang et al., 2018).

Similar to the general population, alcohol was reported as one of the most preferred choices for substance use among 808 of 1588 Deaf adult patients in the Minnesota Chemical Dependency Program for Deaf and Hard of Hearing Individuals (The Minnesota Program, Anecdotal data, December 2017). Although not studied empirically, it is speculated that Deaf adults are at greater risk for untreated alcohol-use disorder due to barriers in health care and the lack of qualified substance abuse specialists and clinicians who are culturally competent to serve this population (Titus & Guthmann, 2010). Studies in the United States and United Kingdom found that the Deaf population generally has lower substance abuse and alcohol use as compared to the hearing population (Dick, 1996; Emond et al., 2015; Lipton & Goldstein, 1997).

On the other hand, some U.S.-based studies using data from interviews or text-based surveys reported either no difference or higher substance abuse and alcohol use among Deaf adults compared to their hearing counterparts (Alvarez, Adebanjo, Davidson, Jason, & Davis, 2006; Isaacs, Buckley, & Martin, 1979; Zazove et al., 1993). In a comparative secondary analysis of alcohol and drug use between deaf and hearing adult respondents, who took the 2013-2014 National Health and Nutrition Examination Survey in English, the prevalence of overall alcohol and drug lifetime use did not significantly differ based on hearing status; however, deaf respondents who were current users tended to use substances more heavily than hearing respondents (Anderson, Chang, & Kini, 2018). A 28-item Substance Abuse Screener administered in American Sign Language (SAS-ASL) was validated on a small sample of 62 Deaf respondents who were recruited from substance use treatment programs and other

behavioral health programs (Guthmann et al., 2012); however, no national prevalence data using this measure has been reported.

Similar to the gender disparity in the hearing adult population internationally (Seylan, Franconi, & De Bruijn, 2009), in a study of 298 Deaf adults in the United Kingdom, Deaf men were reported to drink more alcohol than Deaf women (Emond et al., 2015). In an overview study of chemical dependency in the Deaf adult population, lower education and greater academic problems were identified as risk factors for alcohol use (Guthmann & Sandberg, 1998), which is consistent with findings in an overview study of early adulthood population (Hawkins, Catalano, & Miller, 1992).

Alcohol Use and Socialization

Having a large social network of friends was associated with higher alcohol consumption (Labhart, Anderson, & Kuntsche, 2017; Rosenquist, Murabito, Fowler, & Christakis, 2010). In a longitudinal cohort Framingham Heart Study of 12,067 people, participants' self-reported alcohol drinking behaviors were highly correlated with the alcohol consumption behavior in their social networks of relatives and friends (Rosenquist, Murabito, Fowler, & Christakis, 2010). If an individual's social contacts drank heavily, the individual was more likely to consume more alcohol. Conversely, if the individual was surrounded by social contacts who abstained from alcohol use, the individual was much less likely to drink. In an alcohol consumption study (Labhart et al., 2017) that included 176 participants aged 16 to 25, both men and women drank more than intended when with a larger group of friends. Although no related studies have been done on alcohol use and socialization among Deaf adults in the United States, it is likely that they will migrate to regions of the country that have a relatively large number of Deaf peers that share the same language.

A number of social activities within the Deaf community revolve around the use of alcohol and may occur at a bar, a Deaf club, or a Deaf sporting event. If Deaf adults are working on recovery, these activities could serve as a trigger; yet, if they don't participate, their social interactions may be limited, making them feel more isolated. When adult members of the Deaf community are brought together in proximity, alcohol use may also increase since peers who share the same language tend to socialize more with each other. Given the link between social networks and alcohol consumption in earlier studies of the general population (Rosenquist et al., 2010; Labhart et al., 2017), we expect similar findings for Deaf adults who live in regions that have a high density of Deaf residents.

Study Aims

The aims of this study were two-fold: 1) To report the prevalence of alcohol use in a national sample of Deaf adults who use ASL, and 2) To examine whether proximity to a large Deaf community is associated with greater frequency of alcohol use.

Methods

Secondary analyses were drawn from the Health Information National Trends Survey in ASL (HINTS-ASL) (Kushalnagar, Harris, Paludneviciene, & Hoglind, 2017). This survey was administered online with all items available in both ASL and English. All items went through

rigorous cultural adaptation and linguistic translation prior to administration to a national sample of Deaf adults who use ASL. Readers are referred to Kushalnagar et al., 2017, article for additional details on the HINTS-ASL survey administration procedure. For the purpose of the current study, secondary data on alcohol use was drawn from the HINTS-ASL survey: *A drink of alcohol is 1 can or bottle of beer, 1 glass of wine, 1 can or bottle of wine cooler, 1 cocktail, or 1 shot of liquor. During the past 30 days, how many days per week did you have at least one drink of any alcoholic beverage?* [0 to 7 days].

There is no official record of Deaf communities by size in cities across the United States because the U.S. Census does not collect this information. There is no precedent for measuring density in the Deaf community. In our study, the density of a Deaf community in a region was judged based on the size of schools for the Deaf and employability of Deaf personnel. For example, Riverside, California, Indianapolis, Indianapolis and Washington, D.C. have large schools for the Deaf compared to Dover, Delaware, Dansville, Kentucky, and Las Vegas, Nevada, which have schools for the Deaf with relatively smaller numbers of Deaf employees. Cities that were considered Deaf-dense were assigned a value of 1 and labeled as high Deaf-density (HDD), and those that were not were assigned a value of 0 and labeled as low Deaf-density (LDD).

Statistical Analyses

Descriptive statistics were used to summarize the sample characteristics of Deaf adults who answered the alcohol frequency question. In the first analysis, chi-square analyses were conducted to compare sociodemographic and health-related characteristics between those who identified as non-drinkers (*n*=537) and those who identified as drinkers (*n*=734). The second analysis used multinomial logistic regression approach to identify the characteristics associated with frequency of alcohol use. For this multinomial logistic regression analysis, drinkers were further categorized into three frequency groups: occasional (1 day per week), regular (2-3 days per week), and frequent (more than 4 days per week). Bivariate correlations were run on sociodemographic characteristics known to be associated with alcohol frequency in the general population. Variables that were significantly correlated with alcohol use at a value of $p<.05$ or lower were then entered as predictors in the multinomial logistic regression analyses. Data analysis was done using SPSS version 24.

Results

Table 1 presents sociodemographic characteristics for Deaf adults who responded to the alcohol frequency and other questions for this study (*n*=1271; 42% non-drinkers and 58% drinkers). Drinkers were more likely to be younger, male, college-educated, or employed. A majority of the Deaf sample had health insurance (93%; includes Medicaid/Medicare and private insurance) and regular providers that they saw often (59%), but more non-drinkers had a regular provider (66%, compared to 58% of drinkers). Compared to non-drinkers, drinkers reported significantly higher quality of life and less comorbidity. Approximately 55% of the Deaf adult respondents lived within a strong proximity of a community that was designated as HDD. Of those who lived in HDD areas, 42% preferred ASL only compared to ASL and English. This is comparable to LDD areas; 42% also preferred ASL only. Alcohol consumption was significantly different for Deaf density; those who lived in highly dense areas reported a higher alcohol use.

Table 1: Sociodemographic characteristics of 1271 Deaf respondents by drinker status

Variables		Non-Drinkers (n=537)		Drinkers (n=734)		
		Mean	SD	Mean	SD	*t* (p-value)
Age		45	18	38	14	**8.21*****
	Subgroups	*n*	%	*n*	%	*X²* (p-value)
Gender						**6.69***
	Male	20	37.9%	318	43.5%	
	Female	323	60.4%	392	53.6%	
	Non-binary	9	1.7%	21	2.9%	
Race/Ethnicity						NS
	White	341	64.0%	482	65.9%	
	Non-white	192	36.0%	249	34.1%	
Education						**69.72*****
	High school	153	28.5%	80	10.9%	
	Some college	129	24.1%	174	23.7%	
	College	254	47.4%	479	65.3%	
Employment						**45.10*****
	Employed	270	50.8%	452	62.0%	
	Student	62	11.7%	125	17.1%	
	Retired	89	16.7%	59	8.1%	
	Unemployed	111	20.9%	93	12.8%	
Health insurance coverage						NS
	No	21	4.1%	32	4.4%	
	Yes	475	93.5%	684	94.0%	
	Don't know	12	2.4%	12	1.6%	
Regular provider						**8.15****
	Yes	338	65.6%	420	57.6%	
	No	177	34.4%	309	42.4%	
Quality of life						**8.68***
	Excellent	70	13.1%	114	15.6%	
	Very good	195	36.5%	305	41.7%	
	Good	203	38.0%	249	34.0%	
	Fair/poor	66	12.4%	64	8.7%	
Comorbidity						**16.14*****
	Yes	207	42.5%	222	31.2%	
	No	280	57.5%	490	68.8%	
	Missing					
Alcohol use						**1272.00*****
	Non-drinker	537	100%	-	-	
	Occasional drinker	-	-	369	50.3%	
	Regular drinker	-	-	250	34.1%	
	Frequent drinker	-	-	115	15.7%	
Density of deaf community						**13.98*****
	High density (HDD)	263	49.0%	437	59.5%	
	Low density (LDD)	274	51.0%	297	40.5%	
Preferred language						NS
	ASL only	224	42.3%	307	41.8%	
	ASL and English	305	57.7%	427	58.2%	

Note. Frequencies not summing to N = 745 and percentages not summing to 100 reflect missing data.
*p<.05
**p<.01
***p<.00

Frequency of alcohol use was categorized as non-drinker, occasional drinker (1 day per week), regular drinker (2-3 days per week), and frequent drinker (more than 4 days per week). From the sample, 42% (n=537) identified as a non-drinker, 29% (n=369) identified as an occasional drinker, 20% (n=250) identified as a regular drinker, and 9% (n=115) identified as a frequent drinker. When all significant sociodemographic variables were entered in a multinomial logistic regression model, the model was significant ($X^2(39)$ =177.020, p<0.001) with the predictors accounting for 16% (Nagelkerke R^2) of the variance in the self-reported alcohol consumption. Proximity to Deaf communities was significantly associated with increased alcohol consumption among those who identified as a regular drinker or frequent drinker (OR: 1.45, 95% CI: 1.04, 2.03, and OR: 2.68, 95% CI: 1.66, 4.33 respectively) compared to those who identified as a non-drinker. Also, Deaf individuals who were younger, male, or educated were incrementally significantly more likely to have increased alcohol consumption. Retired individuals were five times more likely to be frequent drinkers than non-drinkers. For this subgroup, the wide confidence interval range suggests a small sample size (OR: 5.05, 95% CI: 1.63, 15.63) and should be interpreted with caution.

Discussion

Alcohol use within the past 30 days was prevalent in slightly more than half (58%) of our national sample of Deaf adults aged 18 and over, which is similar to the general population's reports that about 56% of them drank in the past month (Hasin et al., 2016). However, when all significant covariates were entered in the model, Deaf adults who lived in HDD communities demonstrated an increased risk for frequent alcohol consumption compared to LDD communities. As opposed to the general population, Deaf adults do not have easy access to alcohol health information and are at risk for low alcohol literacy. Although there are ASL videos about alcohol on the Internet, Deaf adults who have low health literacy might have some difficulty navigating the Internet to find these ASL videos (Kushalnagar et al., 2015). This barrier to health information may be overcome through interaction with health literate peers (Kushalnagar, P., Ryan,Smith, & Kushalnagar, R., 2017).

Furthermore, our study results showed that Deaf adults who were younger, male, or educated had a higher likelihood for reporting greater alcohol consumption. These individuals were more likely to live in HDD communities with more social opportunities than LDD communities. The majority of HDD communities were in major metropolitan areas, which has been linked to increased drinking in the general population (Matthews et al., 2017). Several studies found that geographic location plays a role in the built environment and alcohol laws, which can modify drinking patterns in urban areas (Dixon & Chartier, 2016; Lo, Weber, & Cheng, 2013; Tanumihardjo, Shoff, Koenings, Zhang, & Lai, 2015)

Our study results also showed that retired individuals were five times more likely to be frequent drinkers than non-drinkers. Alcohol abuse and alcoholism are common, yet under-recognized problems among older adults, regardless of hearing status. Although there is no prevalent data that has looked at Deaf older adults and their rate of alcohol use, The Minnesota Program has provided treatment to 24 individuals over the age of 61 (Guthmann, n.d.). Some clients acknowledged that they began drinking after retirement, due to boredom, and others had become lonelier and depressed after their spouse or significant other died (Guthmann &

Sandberg, 1998). Although the data is anecdotal, it may give some insight into why individuals who have retired are more likely to be frequent drinkers.

Accessible materials related to alcohol should be available to the Deaf community at a younger age so that when Deaf individuals become adults, they are better able to make decisions based on accurate information about the effect alcohol use has on an individual. Having alcohol information available in ASL on the Internet can also provide Deaf youth and adults with equal access to information and support their ability to make informed choices.

Limitations

There were some limitations to this study. The alcohol item used in this analysis was limited to frequency of alcohol use over seven days. This may not translate to binge drinking, which would have provided greater insights on the risks for alcohol abuse in an U.S. sample of Deaf adults who use ASL. This data was not gathered in the original HINTS-ASL study and should be considered in future studies. As of yet, we have no data on additional psychological factors that might explain the increased risk for alcohol use among older Deaf adults who are retired.

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