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Distress and alcohol-related harms from intimates, friends, and strangers

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Abstract

Alcohol's harms to others (AHTO) has gained increased research and policy attention, yet little information is available on different social relationships involved in such harms or consequences of harms perpetrated by various types of drinkers. Using data from the 2014–15 U.S. National Alcohol Survey (N=5,922), we present analyses comparing frequency and impacts of eight past-year harms from other drinkers. In this sample (53% female; 66% White/Caucasian, 13% Black/African American, and 15% other race; 15% Hispanic/Latino of any race; mean age=47 years), 19% reported at least one harm in the prior 12 months, 8% reported more than one harm, 4.9% reported a family perpetrator, 3.5% a spouse perpetrator, 6.1% a friend perpetrator, and 8.1% a stranger perpetrator. Controlling for basic demographics, the number of harms in the past year and harms perpetrated by known others (but not strangers) were significantly associated with recent distress. When comparing specific harms, financial problems due to a family member's or a spouse/partner's drinking each were associated with significantly greater distress, as were feeling threatened or afraid of family members, spouses/partners or friends who had been drinking. These new data shed light on possible intervention points to reduce negative impacts of AHTO in the U.S.

Keywords

family; social relationships; alcohol's harms to others; mental health; population survey

Introduction

Although alcohol-related health and social harms incurred by drinkers have long been studied (see, for example, summaries in Greenfield, 2001; Rehm, Greenfield, & Kerr, 2006), there has been relatively little attention to the many ways heavy drinkers harm other people (Greenfield et al., 2009; Room et al., 2010). In contrast to alcohol-related harm due to a person's own heavy drinking, this second type of harm is referred to as alcohol's harm to others (hereafter, AHTO), externalities, second-hand effects and collateral damage from

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drinking (Giesbrecht, Cukier, & Steeves, 2010). While some effects of others' harmful drinking have a large literature, such as fetal alcohol exposure or fetal alcohol spectrum disorders (FASD) and drunk driving, the array of AHTO has not been comprehensively investigated in the U.S. general population. In the U.S., much of the detailed work on this topic has been limited to local surveys (Fillmore, 1985; Jones & Greenfield, 1991) or studies of college students (Cabalatungan & McCarthy, 2015; Wechsler, Lee, Hall, Wagenaar, & Lee, 2002; Weitzman & Chen, 2005). Thus, we examine frequency and impacts of eight past-year harms perpetrated by partners, family members, friends and strangers who have been drinking, as reported by a population-representative sample of U.S. adults.

Background

Examining subtypes of AHTO is of major significance in the alcohol field because of a need to assess severity of the impacts of various harms stemming from others' drinking. Intangible cost metrics (such as detriments to victims' mental health) to estimate impact of AHTO are not well established (Navarro, Doran, & Shakeshaft, 2011). Outside the area of FASD, few studies have taken account of intangible costs for victims. Quantifying impacts on quality of life and mental health of those affected by others' drinking, especially alcohol-related family problems and injuries inflicted by drinking strangers, has only recently become a focus in several developed countries, especially Australia and New Zealand (Casswell, You, & Huckle, 2011; Connor, You, & Casswell, 2009; Ferris, Laslett, Livingston, Room, & Wilkinson, 2011; Laslett et al., 2011). Because AHTO typically have not been comprehensively accounted for, and until recently have been inadequately assessed, harmful effects of alcohol likely have been significantly underestimated (Navarro et al., 2011).

In part because the World Health Organization's (WHO) Global Strategy to Reduce Alcohol Harms now includes attention to AHTO (World Health Organization, 2010, 2011), work in this area has increased steadily over the past decade, with projects in Australia (Ferris et al., 2011; Laslett et al., 2011), New Zealand (Casswell, You, et al., 2011; Connor et al., 2009), Ireland (Hope, 2008), Norway (Rossow & Hauge, 2004) and other Nordic countries (Moan et al., 2015), and several low and middle income countries (World Health Organization, 2012). Much of this work has been descriptive and focused on documenting the prevalence of different types of alcohol-related harms for population subgroups defined by sociodemographic characteristics and drinking behaviors. Despite variation in drinking cultures across these countries, general findings support early observations from the U.S. (Fillmore, 1985) and Canada (Kellner, Webster, & Chanteloup, 1996; Kellner, Webster, Hill, & Mills, 1996): AHTO involving strangers are more commonly experienced by younger people (Laslett et al., 2011; Moan et al., 2015; Rossow & Hauge, 2004) who are themselves heavy drinkers (Moan et al., 2015; Rossow & Hauge, 2004).

Recent U.S. research confirms AHTO are not limited to victimization of young adults and heavy drinkers by strangers (Greenfield et al., 2009). Accordingly, we focus on several types of alcohol-related victimization that include harms from drinkers known to the respondent (such as a heavy-drinking intimate partner, relative or acquaintance), as well as harms from strangers. Different harms are likely to be associated with each type of "other", with assaults

and vandalized property likely more common from strangers' drinking (Greenfield et al., 2011; Scott, Schafer, & Greenfield, 1999) and marital problems and financial harms more often involving known heavy drinkers (Laslett, Ferris, Dietze, & Room, 2012; Livingston, Wilkinson, & Laslett, 2010). The latter are expected to involve greater negative impacts on mental health (Ferris et al., 2011).

There is a growing literature that shows experiencing alcohol's harms from other drinkers is associated with significantly worse mental health (Ferris et al., 2011; Livingston et al., 2010). One recent study using the 2010 U.S. National Alcohol Survey (Greenfield, Karriker-Jaffe, Kerr, Ye, & Kaplan, 2016) found four harms from other drinkers—family and marriage difficulties; financial troubles; being pushed, hit or assaulted; and having property vandalized—each showed a strong, independent association with depression. Here, we use data from the 2015 U.S. National Alcohol Survey to examine associations of a larger set of AHTO, classified by reported perpetrator, with distress (including both depression and/or anxiety). Thus, our goals were to (1) compare rates and types of AHTO by perpetrator relationships (both strangers and known perpetrators), as well as by victim gender, racial/ethnic group, SES, family history of alcohol problems and drinking status; and (2) examine relationships between perpetrator type, specific harms, and distress. We expected women and those with a family history of alcohol problems to experience more family- and partner-perpetrated harms, and men and young adults to experience more stranger-perpetrated harms (particularly violence victimization). We anticipated family- and spouse-perpetrated harms would be more strongly associated with distress than stranger-perpetrated harms.

Method

Dataset

Data came from the 2014–15 National Alcohol Survey (NAS), which involved computer-assisted telephone interviews with a representative sample of English- or Spanish-speaking U.S. residents 18 years of age and older. The NAS utilized a dual-frame sampling design that included a two-stage stratified, list-assisted, random digit dialing (RDD) samples of adults from landline telephone households and cellular (cell) phone users, who are an ever-increasing segment of the U.S. population (Blumberg & Luke, 2013). It included targeted oversamples of Black/African American and Hispanic/Latino (hereafter, Black and Hispanic, respectively) respondents drawn from geographic-based strata with at least 40% Black or Hispanic residents, with a fractional sample of other, mostly White, respondents from these targeted sampling areas as well.

Up to 15 attempts were made to reach landline households, with up to six attempts made to reach cell phone respondents. Calls were made at various times of day and on different days of the week to maximize the likelihood of reaching an eligible respondent. An IRB-approved consent script informed potential participants about the sponsoring institutions, topics covered in the interview, possible risks and benefits of participation, and their right to decline participation, skip questions, or terminate the interview at any time. Additional details on the consent process are provided elsewhere (Greenfield, Karriker-Jaffe, Kaplan, Kerr, & Wilsnack, 2015). Interviewers ascertained cell phone users were in a safe situation to talk on the phone (i.e., not driving or in public where privacy could be jeopardized).

Respondents received an incentive of either US\$10 or US\$20 for completing the interview, depending on stratum. The Institutional Review Boards of the Public Health Institute, Oakland, CA and ICF Macro, Inc., Fairfax, VA (the fieldwork agency) approved all study protocols.

The combined cooperation rate (proportion of confirmed eligible people who completed the survey) was 59.8%, with an AAPOR COOP4 rate of 43.4% (52.0% cell and 38.7% landline) (The American Association for Public Opinion Research, 2011). To assess whether survey completion was associated with past-year drinking status, we divided the landline and cell samples into 50 random groups each and calculated the varying completion rate and proportion of drinkers for each group; a regression analysis showed no significant relationship between completion rate and proportion of drinkers for either the cell (R-square=0.0012, p=0.81) or landline (R-square=0.0099, p=0.49) samples.

Survey length averaged 46 minutes for complete interviews (n=5,632) and 27 minutes for partially-complete cases (n=991; defined as those who completed demographics, alcohol consumption patterns, alcohol problems, and alcohol treatment items). Overall, 40.9% were cell phone cases and 8.4% completed the interview in Spanish. Of the partially-complete cases, 290 had data on harms from other drinkers, resulting in a sample of 5,922 cases for AHTO analyses.

Measures

Harms from other drinkers included eight past-year harms caused by someone who had been drinking: (a) having family problems or marriage difficulties; (b) being pushed, hit or assaulted; (c) having house, car or other property vandalized; (d) having financial trouble; (e) being in a traffic accident; (f) being harassed, bothered, called names or otherwise insulted; (g) feeling threatened or afraid; and (h) being physically harmed. In addition to a brief set of five items used on prior Canadian (Eliany, Giesbrecht, Nelson, Wellman, & Wortley, 1992) and U.S. (Greenfield et al., 2014; Greenfield et al., 2016; Greenfield et al., 2009; Karriker-Jaffe & Greenfield, 2014) National Alcohol Surveys (items a–e), we included three items (items f–h) from a new WHO survey on AHTO (World Health Organization, 2012). The latter items draw on recent experience with more extensive surveys in Australia (Laslett et al., 2011) and New Zealand (Casswell, Harding, You, & Huckle, 2011). Added to these are follow-up assessments of the perpetrator of each harm, including intimate partners (spouses as well as boyfriends/girlfriends), family members (parents, step-parents, siblings, children or other family), friends or coworkers (someone known to respondent), and strangers (including someone not known by name). Key exposures included a count of harms experienced in the past year (range: 0–8), as well as a dichotomous indicator of one or more harm experienced. We also classified the perpetrators overall (using dichotomous variables such as family perpetrator coded yes/no) and for each specific harm (using dichotomous variables such as family-perpetrated financial problems coded yes/no).

Distress was measured using two questions that screened for depression (PHQ-2: feeling down/depressed/hopeless, feeling little interest/pleasure in doing things (Kroenke, Spitzer, & Williams, 2003)) and two that screened for anxiety (GAD-2: feeling nervous/anxious/on edge, not being able to stop or control worrying (Kroenke, Spitzer, Williams, Monahan, &

Löwe, 2007)). The PHQ-2 includes DSM-IV diagnostic core criteria for depressive disorders, and the GAD-2 includes two core criteria for generalized anxiety disorder (American Psychiatric Association, 1994). Summary scores range from 0 to 6, with scores of 3 or more on either measure indicating probable cases of depression or anxiety, respectively (Löwe et al., 2010). Using the 4 items together (PHQ-4; Kroenke, Spitzer, Williams, & Löwe, 2009), we classified respondents as positive for either depression and/or anxiety (vs. negative for both). A small group of respondents (5.3%, n=285) screened above clinical guidelines for distress (2.4% with depression, 3.8% with anxiety) in the past two weeks. Control variables were respondent age (categorical variable spanning 18–25 years to 66 or more years in 10-year increments, with oldest group as referent), male gender, race/ethnicity (using non-exclusive indicators for Hispanic/Latino ethnicity, Black/African American race and Asian/Other race, with “only White/Caucasian” as effective referent), drinker status (indicator variables comparing past-year and former drinkers with lifetime abstainers), family history of alcohol problems (non-exclusive indicator variables for biological mother, biological father and other biological relative who is/was a problem drinker or alcoholic), education (indicators for less than high school diploma, high school graduate or equivalent, and some college or technical school, with at least a 4-year college or university degree as referent), and having an annual income below the national median of US\$50,000/year (with an indicator for missing income data).

Analysis

We used chi-square analyses to examine associations of respondent demographics with the AHTO outcomes. We used multivariate logistic regression to examine associations of the count of AHTO and type of AHTO perpetrator (such as family member) with distress. To identify specific types of alcohol-related harm significantly associated with distress, we used a hierarchical model-building process: (1) we entered each specific harm (such as being harassed by someone who had been drinking) in a logistic regression model controlling for demographic characteristics; (2) then all harms that were significantly associated with distress in step 1 were entered together in a controlled logistic regression model; and (3) on the final step we removed harms that were no longer significantly associated with distress in the multi-harm, adjusted models in step 2. For each harm significantly associated with distress in step 3, we then used a set of perpetrator-specific indicators (such as family-, spouse- and friend-perpetrated financial problems) to assess differences by perpetrator in relationships of each harm with distress. We also used interactions of the count of AHTO and the type of AHTO perpetrator with drinker status (current drinker vs. not) as well as with gender (separately) to examine whether associations with distress differed by subgroup. Data were weighted to adjust for sampling and non-response, with all analyses conducted using Stata version 13 (Stata Corp., 2013). Model fit was assessed using the Archer-Lemeshow test (Archer & Lemeshow, 2006), with significant F-adjusted mean residual tests suggesting poor model fit.

Results

In the weighted sample, average age was 47.0 years (SD=17.9), and 47.5% of respondents were male (n=2,374). Two-thirds (66.1%) were White (only), and 14.8% were Hispanic,

12.6% Black, and 15.2% Asian, Native American or other race/ethnicity (non-White groupings not mutually exclusive). A minority of respondents (12.0%) had not graduated from high school, and 25.3% had obtained a high school diploma or equivalent (GED), 32.8% had attended some college or technical/ vocational school after high school, and 30.0% had received at least a four-year college or university degree. About half (49.4%) had incomes of \$50,000/year or less, and 7.3% were missing data on income. Two-thirds (67.2%) were current drinkers, 20.2% were former drinkers who had not consumed alcohol in the past 12 months, and 12.6% were lifetime abstainers. Regarding family history of alcohol problems, 6.4% had a biological mother, 17.3% had a biological father, and 37.6% had another blood relative who was a problem drinker.

In the past year, 19.3% experienced at least one of the eight harms (14.9% were harassed; 6.7% felt threatened/afraid; 3.7% had family/marital problems; 3.6% were pushed/hit/assaulted; 2.8% had property vandalized; 2.0% were physically harmed; 1.9% had financial problems; and less than 1% had been in a traffic accident caused by someone who had been drinking). In terms of attributed source, 4.9% of the sample reported a family perpetrator, 3.5% a spouse perpetrator, 6.1% a friend perpetrator, and 8.1% a stranger perpetrator (multiple perpetrators were possible). Figure 1 shows the prevalence of each type of perpetrator within a given type of harm. Family/marital problems were most commonly attributed to family members and spouses. Financial problems also were most commonly due to drinking spouses, while assaults, vandalism and traffic accidents were most commonly attributed to strangers. Physical harm was most commonly attributed to drinking spouses and strangers.

Table 1 shows the relationship between the demographic variables and the key AHTO variables. In general, younger respondents were more likely to experience AHTO, particularly harms perpetrated by friends or strangers. Women were more likely than men to experience harms from family members or spouse/partners. Hispanics were more likely than other racial/ethnic groups to experience harm from family members, while Asians/others were more likely to experience harm from strangers. Current drinkers were more likely than former drinkers or lifetime abstainers to experience AHTO, particularly harms perpetrated by friends or strangers. Individuals with a family history of alcohol problems were more likely to experience AHTO perpetrated by known individuals (but not by strangers). Finally, respondents in the lowest income group also were more likely than respondents with higher incomes to experience AHTO perpetrated by known individuals (but not by strangers).

Table 2 shows that the count of harms experienced in the prior 12 months was associated with significantly increased odds of distress, with each additional type of harm increasing the odds of distress by 50% (Model 1). Harms perpetrated by family members, spouses/partners and friends were more strongly associated with distress than stranger-perpetrated harms, which were not significantly associated with recent distress (Model 2).

When examined independently and controlling for demographics, each of the eight harms was positively associated with distress, with ORs ranging from 2.27 for being in an accident (the only relationship that was not statistically significant) to 7.13 for having financial problems caused by someone who had been drinking (full models available upon request).

As shown in Table 3, in a multi-harm model, the two specific harms significantly associated with greater distress were having financial problems due to someone else's drinking and feeling threatened by or afraid of someone who had been drinking (Model 1). When examined in relation to specific perpetrators of each of these two type of harm, having financial problems due to a family member's or a spouse/partner's drinking each were associated with significantly greater distress, but financial problems due to a friend's drinking were not (only two people reported financial problems due to a stranger's drinking, so this was not included in Model 2). Model 3 showed that feeling threatened or afraid of family members, spouses/partners or friends who had been drinking each were associated with significantly greater odds of distress, but feeling threatened/afraid of a stranger who had been drinking was not.

The moderation models showed that there were no significant interactions of either drinker status or gender with either the count of AHTO or the type of AHTO perpetrator on distress. These results are available upon request.

Discussion

In this nationally-representative sample of U.S. adults, the two most commonly reported AHTO were (a) being harassed by and (b) feeling threatened by or afraid of someone who had been drinking. AHTO attributed to strangers were the most common, followed by AHTO perpetrated by friends. For certain harms, however, spouse perpetrators were more common than friends; these included assault, physical harm, and vandalism of property. A comparative study of six Nordic countries also found that being afraid of a drunken person was the most commonly reported AHTO (Moan et al., 2015). As in prior research from the U.S. and elsewhere (Fillmore, 1985; Karriker-Jaffe & Greenfield, 2014; Kellner, Webster, & Chanteloup, 1996), we saw elevated rates of AHTO among current drinkers, individuals with a family history of alcohol problems and those in the lowest income groups. Notably, known perpetrators (rather than strangers) were more common in these last two groups. As seen in Australian samples (Laslett et al., 2011), we also noted increased rates for women of victimization by family and spouses compared to rates of such victimization for men.

In this U.S. sample, there were stronger relationships of distress with AHTO perpetrated by known others than with those by strangers. Two recent studies from Australia show a similar pattern of results emphasizing the detrimental impacts of harm from intimates and friends. Livingston and colleagues (2010) noted respondents living with a heavy drinker showed lower personal well-being compared to respondents without heavy drinkers in the household. They also found an increase in the number of known heavy drinkers was associated with significantly lower personal well-being. Using the same Australian dataset, Ferris and colleagues (2011) showed that respondents who knew a heavy drinker reported significantly greater depression and anxiety than those without a heavy drinker in their life. They further noted that respondents who had been negatively impacted by a heavy-drinking partner, friend or co-worker in the past year showed markedly worse mental well-being and mental health (indicated by depression or anxiety at the time of interview). Future U.S. research should examine differences by age and residence status to assess whether AHTO perpetrated by known drinkers are more detrimental for younger victims or for those co-

habiting with the perpetrator, as well as whether recurrent harms are associated with even worse outcomes for victims. Another interesting question is whether alcohol-related harms are reciprocal within dyads—that is, are those harmed by other drinkers also perpetrating alcohol-related harms themselves (Seid, Grittner, Greenfield, & Bloomfield, 2015)—and this area deserves further research.

One of the most common harms, being threatened by or feeling afraid of someone who had been drinking, could be seen as a relatively minor offense, but the impact of such harms may depend on the particular event and the duration of the heightened state of fear. When compared with other types of harms, being threatened by someone who had been drinking was one of the harms most strongly associated with recent distress, even after accounting for demographic characteristics of the victim. In particular, we saw significant associations of recent distress with being threatened by a family member, a spouse/partner or a friend in the past year. These findings suggest that respondents may be referring to relatively serious events that have lasting consequences for their mental health. Further investigation into characteristics of specific events involving AHTO and factors that may protect victims from their long-term negative impacts is needed.

Our results extend findings from recent Australian studies (Ferris et al., 2011; Livingston et al., 2010) focused on negative impacts of respondents' relationships with heavy drinkers on personal well-being and health-related quality of life. They found respondents who had at least one heavy drinker in their social circle (including family, friends and co-workers) had lower mental well-being and greater distress (either anxiety and/or depression), particularly if they had been negatively affected by that person's drinking in the past year (Ferris et al., 2011). Our findings from the 2015 NAS also advance beyond results from the 2010 NAS (Greenfield et al., 2016) in several ways: (1) We included the source of AHTO and observed greater impacts from harm attributed to drinking of known others than strangers; (2) we identify particular harms associated with markedly increased odds of recent distress, including financial problems due to someone else's drinking and feeling threatened by someone who had been drinking; and (3) we also utilized a well-known, brief screening measure for distress (Kroenke et al., 2009; Löwe et al., 2010) that includes both depression and anxiety.

Because our study is cross-sectional, causality cannot be established. However, the AHTO items referenced the previous 12 months, while the distress items referenced the prior two weeks. Thus, it is likely that distress was assessed following, rather than before, experiencing an alcohol-related harm. Another limitation is that, even with a large, representative sample, there remains somewhat limited statistical power for assessing the impacts of certain types of rarely-occurring harms; thus, models using specific harms within perpetrator groups (such as financial problems due to a friend or co-worker's drinking, which was reported by only 14 people) should be taken provisionally. We used analytic weights to represent the U.S. adult population at the time of data collection, but our findings may not be representative of certain population subgroups such as college students who may be at elevated risk of AHTO. We also note that some harms, including those perpetrated by intimate partners, are likely to be under-reported due to social desirability concerns or a reluctance to trigger police or social services involvement (Hien & Ruglass, 2009).

Additionally, further research should assess sexual assault by people who have been drinking, as this topic is not widely studied in general population samples. Unwanted sexual contact is a very common form of alcohol-related harm experienced by young adults in the U.S. (Cabalatungan & McCarthy, 2015).

Conclusion

These new data shed light on possible intervention points to reduce negative impacts of AHTO in the U.S. Notably, targeted mental health interventions for people living with heavy-drinking partners or who have family members with alcohol problems may be warranted, and outreach into low-income communities also may help reduce the impact of AHTO. Other programs to reduce harm caused by heavy drinkers in the community, including friends as well as strangers, also are needed. Analyses of large U.S. survey datasets indicate that heavy drinking has increased in the general population over the past 15 years (Dawson, Goldstein, Saha, & Grant, 2015; Kerr, Mulia, & Zemore, 2014). In this context, additional research on AHTO to identify promising protective strategies is desperately needed.

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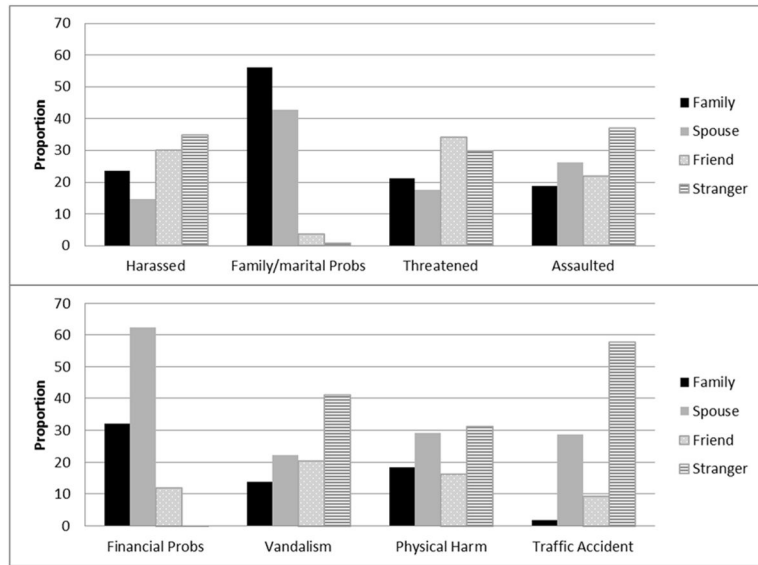


Figure 1.
Most common perpetrator for a given harm
Note: Probs = Problems.

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Table 1
 Harms from someone else's drinking, 2015 U.S. National Alcohol Survey (N=5,922)

| | 1+ Past-year harm | Family perpetrator | Spouse perpetrator | Friend perpetrator | Stranger perpetrator |
|---|--------------------------|---------------------------|---------------------------|---------------------------|-----------------------------|
| Count (% ^a) | 1044 (19.3%) | 273 (4.8%) | 164 (3.5%) | 289 (6.0%) | 442 (8.1%) |
| Age | | | | | |
| 18-25 years | * 37.5% | * 9.5% | * 5.2% | * 14.1% | * 17.5% |
| 26-35 years | 21.9% | 5.3% | 4.1% | 6.5% | 9.1% |
| 36-45 years | 18.0% | 4.1% | 5.1% | 5.6% | 6.4% |
| 46-55 years | 18.6% | 4.5% | 3.4% | 4.7% | 9.0% |
| 56-65 years | 14.9% | 4.4% | 3.2% | 3.8% | 5.4% |
| 66+ years | 8.0% | 1.9% | 0.6% | 2.6% | 2.8% |
| Gender | | | | | |
| Males | 19.1% | 3.8% | 2.1% | 6.7% | 9.2% |
| Females | 19.6% | 5.8% | 4.7% | 5.5% | 7.0% |
| Race/ethnicity | | | | | |
| White/Caucasian only | 17.8%* | 4.6% | 3.2% | 5.5% | 7.4% |
| Hispanic/Latino ^b | 23.0%* | 7.0%* | 3.1% | 6.3% | 9.4% |
| Black/African American ^b | 20.9% | 3.9% | 3.9% | 8.3% | 8.0% |
| Asian/Other ^b | 23.6%* | 5.7% | 4.9% | 6.1% | 10.9%* |
| Drinker status | | | | | |
| Past-year drinker | * 21.4% | 5.3% | 4.0% | 7.0% | 8.7% |
| Former drinker | 14.9% | 3.7% | 3.4% | 4.3% | 5.5% |
| Lifetime abstainer | 15.3% | 4.1% | 1.1% | 3.8% | 8.9% |
| Family history of alcohol problems | | | | | |
| No blood relatives with alcohol problems | 15.0%* | 1.2%* | 2.5%* | 4.5%* | 8.0% |
| Biological mother ^c | 31.8%* | 15.1%* | 8.0%* | 11.2%* | 12.1% |
| Biological father ^c | 25.1%* | 11.1%* | 6.1%* | 6.8% | 7.3% |
| Other biological family ^c | 24.0%* | 7.8%* | 3.9% | 7.5%* | 9.4% |
| Education | | | | | |
| Less than high school | 19.1% | 5.3% | 4.2% | 3.8% | 8.8% |

| | 1+ Past-year harm | Family perpetrator | Spouse perpetrator | Friend perpetrator | Stranger perpetrator |
|----------------------------------|-------------------|--------------------|--------------------|--------------------|----------------------|
| High school graduate | 18.1% | 5.1% | 2.9% | 6.0% | 7.4% |
| Some college or technical school | 21.7% | 5.8% | 4.5% | 8.3% | 7.3% |
| 4-year college degree | 18.1% | 3.5% | 2.6% | 4.7% | 9.2% |
| Income | * | * | * | * | |
| <= \$10K/year | 31.2% | 10.5% | 7.8% | 13.5% | 10.1% |
| \$10,001–30K | 20.5% | 5.9% | 3.0% | 5.9% | 8.5% |
| \$30,001–60K | 19.8% | 4.0% | 4.2% | 5.5% | 8.2% |
| \$60,001–100K | 17.1% | 4.9% | 3.1% | 5.3% | 6.5% |
| \$100,001+/year | 15.2% | 2.9% | 2.3% | 3.8% | 7.6% |
| Missing income | 15.2% | 1.6% | 1.4% | 6.4% | 8.4% |

* $p < .05$ for chi-square test of significance comparing those with harms or a noted perpetrator to those without.

^a All percentages are weighted; count is unweighted.

^b Not mutually-exclusive, reference is White/Caucasian only.

^c Not mutually-exclusive, reference is no blood relatives with alcohol problems.

Table 2

Relationships between distress and harms from someone else's drinking, 2015 U.S. National Alcohol Survey (unweighted N=5,511)

| | Model 1 | | Model 2 | |
|---|-------------------|---------|-------------------|---------|
| | OR (95% CI) | P-value | OR (95% CI) | P-value |
| Count of harms from someone who had been drinking | 1.50 (1.28, 1.75) | <0.01 | | |
| Family member perpetrated harm | | | 1.96 (1.05, 3.66) | 0.04 |
| Spouse/partner perpetrated harm | | | 2.56 (1.13, 5.82) | 0.02 |
| Friend perpetrated harm | | | 2.37 (1.29, 4.36) | 0.01 |
| Stranger perpetrated harm | | | 1.37 (0.73, 2.55) | 0.33 |
| Age (vs. 66+ years) | | | | |
| 18–25 years | 1.47 (0.65, 3.30) | 0.35 | 1.53 (0.69, 3.38) | 0.30 |
| 26–35 years | 1.23 (0.58, 2.63) | 0.59 | 1.24 (0.60, 2.59) | 0.56 |
| 36–45 years | 1.27 (0.61, 2.64) | 0.53 | 1.29 (0.62, 2.70) | 0.49 |
| 46–55 years | 1.91 (1.07, 3.41) | 0.03 | 1.92 (1.08, 3.42) | 0.03 |
| 56–65 years | 1.15 (0.61, 2.16) | 0.67 | 1.15 (0.61, 2.16) | 0.67 |
| Male gender | 0.77 (0.51, 1.17) | 0.22 | 0.78 (0.51, 1.20) | 0.26 |
| Race/ethnicity (vs. White only) | | | | |
| Hispanic/Latino ^a | 0.69 (0.40, 1.20) | 0.19 | 0.70 (0.41, 1.18) | 0.18 |
| Black/African American ^a | 0.79 (0.47, 1.33) | 0.38 | 0.79 (0.47, 1.34) | 0.38 |
| Asian/Other ^a | 0.71 (0.39, 1.29) | 0.26 | 0.72 (0.39, 1.33) | 0.30 |
| Drinker status (vs. lifetime abstainer) | | | | |
| Past-year drinker | 0.86 (0.49, 1.51) | 0.60 | 0.90 (0.52, 1.58) | 0.72 |
| Former drinker | 1.24 (0.66, 2.33) | 0.50 | 1.22 (0.66, 2.28) | 0.53 |
| Family history of alcohol problems | | | | |
| Biological mother ^b | 0.90 (0.47, 1.75) | 0.77 | 0.91 (0.48, 1.72) | 0.77 |
| Biological father ^b | 1.63 (1.03, 2.57) | 0.04 | 1.70 (1.09, 2.65) | 0.02 |
| Other biological family ^b | 1.35 (0.90, 2.02) | 0.15 | 1.37 (0.90, 2.09) | 0.14 |
| Education (vs. college degree) | | | | |
| Less than high school | 2.75 (1.40, 5.39) | <0.01 | 2.82 (1.43, 5.55) | <0.01 |
| High school graduate | 1.50 (0.80, 2.79) | 0.20 | 1.48 (0.78, 2.79) | 0.23 |
| Some college or technical school | 1.22 (0.67, 2.22) | 0.53 | 1.20 (0.65, 2.22) | 0.55 |
| Income (vs. >\$50K/year) | | | | |
| Below median | 1.14 (0.45, 2.90) | 0.78 | 1.23 (0.51, 2.96) | 0.64 |
| Missing income | 1.98 (1.15, 3.41) | 0.01 | 2.00 (1.18, 3.39) | 0.01 |
| Intercept | 0.02 (0.01, 0.04) | <0.01 | 0.02 (0.01, 0.04) | <0.01 |
| Archer-Lemeshow test of model fit | F(9, 5499) = 0.63 | 0.78 | F(9, 5499) = 1.42 | 0.17 |

^aVariables are not mutually-exclusive, reference group is White/Caucasian only.

^bVariables are not mutually-exclusive, reference group is no blood relatives with alcohol problems.

Table 3

Relationships between distress and specific harms from someone else's drinking in the 2015 U.S. National Alcohol Survey

| | AOR ^I (95% CI) | P-value |
|--|---------------------------|---------|
| Model 1 | | |
| Financial problem due to someone's drinking | 4.41 (1.67, 11.6) | <0.01 |
| Felt threatened or afraid of someone who had been drinking | 2.49 (1.31, 4.72) | 0.01 |
| Archer-Lemeshow test of model fit | F(9, 5429) = 0.94 | 0.49 |
| Model 2 | | |
| Financial problem due to family member's drinking | 5.01 (1.07, 23.42) | 0.04 |
| Financial problem due to spouse/partner's drinking | 4.76 (1.19, 19.06) | 0.03 |
| Financial problem due to friend's drinking | 2.06 (0.04, 112.06) | 0.72 |
| Archer-Lemeshow test of model fit | F(9, 5434) = 0.50 | 0.87 |
| Model 3 | | |
| Felt threatened/afraid of family member who had been drinking | 3.04 (1.23, 7.52) | 0.02 |
| Felt threatened/afraid of spouse/partner who had been drinking | 4.28 (1.05, 17.47) | 0.04 |
| Felt threatened/afraid of friend who had been drinking | 4.12 (1.82, 9.32) | <0.01 |
| Felt threatened/afraid of stranger who had been drinking | 1.46 (0.45, 4.73) | 0.53 |
| Archer-Lemeshow test of model fit | F(9, 5468) = 0.49 | 0.88 |

^IAOR = adjusted odds ratio. All models adjusted for age (categorical variable spanning 18–25 years to 66+ years in 10-year increments, with oldest group as referent), male gender, race/ethnicity (non-exclusive indicators for Hispanic/Latino ethnicity, Black/African American race and Asian/Other race, with “only White/Caucasian” as effective referent), drinker status (indicator variables comparing past-year and former drinkers with lifetime abstainers), family history of alcohol problems (non-exclusive indicator variables for biological mother, biological father and other biological relative who is/was a problem drinker or alcoholic), education (indicators for less than high school diploma, high school graduate or equivalent, and some college or technical school, with at least a 4-year college or university degree as referent), and having an annual income below the national median of US\$50,000/year (with an indicator for missing income data as well). Approximate coefficients for the association of distress with the covariates can be seen in Table 2.