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Association of alcohol use and loneliness frequency among middle-aged and older adult drinkers

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Abstract

Objectives—We examined the association between alcohol use, at-risk drinking, and binge drinking, and loneliness in a sample of middle-aged and older adults.

Methods—We studied participants aged 50+ years from the 2008 wave of the Health and Retirement Study who reported alcohol use. We ran separate multinomial logistic regressions to assess the association of three alcohol use outcomes (i.e., weekly alcohol consumption, at-risk drinking, and binge drinking) and loneliness.

Results—After adjusting for covariates, being lonely was associated with reduced odds of weekly alcohol consumption 4–7 days per week, but not 1–3 days per week, compared to average alcohol consumption 0 days per week in the last 3 months. No association was found between at-risk drinking or binge drinking and loneliness.

Discussion—Results suggest that among a sample of community-based adults aged 50+, loneliness was associated with reduced alcohol use frequency, but not with at-risk or binge drinking.

Keywords

loneliness; older adult; alcohol; at-risk drinking; binge drinking

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Contributors

Author SC designed the study and managed the literature searches and summaries of previous related work. Authors SC, PM, and CK undertook the statistical analysis. Author SC wrote the first draft of the manuscript and authors PM, CK, and AS provided guidance and critical feedback to drafts. All authors contributed to and have approved the final manuscript.

Conflict of Interest

All authors declare that they have no conflicts of interest.

Loneliness is prevalent in late life. Estimates from the United Kingdom and the United States suggest that 30–43% of older adults report loneliness “sometimes”; 5–9% report loneliness “often”; and 2% report loneliness “always” (Perissinotto, Cenzer, & Covinsky, 2012; Victor, Scambler, Bowling, & Bond, 2005; Victor, Scambler, Shah, Cook, Harris, Rink et al., 2002; Wilson & Moulton, 2010). Loneliness is conceptualized as an individual’s subjective evaluation of feeling without companionship, isolated, or not belonging (de Jong Gierveld & Havens, 2004; Victor, Scambler, Bond, & Bowling, 2000). Although associated, loneliness is distinct from social isolation, which is an objective measure of the size and diversity of one’s social network and frequency of social interaction (Coyle & Dugan, 2012; Hughes, Waite, Hawkley, & Cacioppo, 2004). For instance, persons with small social networks may not feel lonely, while lonely people may have extensive and diverse social networks (de Jong Gierveld & Havens, 2004; Victor et al., 2000).

Loneliness is associated with declining health, bereavement, living alone, and a limited social network (Adams, Sanders, & Auth, 2004; de Jong Gierveld & Havens, 2004; Victor et al., 2002, 2000). Persons who are lonely are at risk for high blood pressure and poor sleep (Cacioppo et al., 2002; Hawkley, Thisted, Masi, & Cacioppo, 2010), functional decline, increased mortality (Luo, Hawkley, Waite & Cacioppo, 2012; Luo & Waite, 2014; Perissinotto, Cenzer, & Covinsky, 2012), and suicide attempts and ideation (Johnsson & Fridell, 1997; Stravynski & Boyer, 2001). Additionally, lonely adults are more likely to use psychotropic medications, such as hypnotics, sedatives, anxiolytics, neuroleptics, and antidepressants (Gustafsson, Isacson, Thorslund, & Sorbom, 1996); and older women who are chronic benzodiazepine users report loneliness, disliking loneliness, and negative feelings as a result of social isolation (Canham, 2014). Compared to non-lonely persons, those who report loneliness have been found to be more depressed, anxious, and hopeless (Barg et al., 2006), although loneliness is recognized as a construct independent of depression (Adams et al., 2004; Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Perissinotto et al., 2012).

Loneliness has also been linked to poor health behaviors, including drug and alcohol abuse, smoking, and inactivity. In a recent survey, 63% of adults aged 45 years and older who had been diagnosed with drug or alcohol abuse reported being lonely (Wilson & Moulton, 2010). Shankar and colleagues (2011) reported associations between increasing loneliness and smoking as well as physical inactivity. In addition, among older adults in alcohol abuse day treatment programs, loneliness (along with depression and sadness) preceded the first drink on a typical drinking day (Schonfeld & Dupree, 1991).

Alcohol consumption is common among adults in late life and alcohol abuse is expected to increase among older adults (Blow & Barry, 2002; Gfroerer, Penne, Pemberton, & Folsom, 2003; Patterson & Jeste, 1999). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines at-risk drinking for adults over age 65 years as more than three drinks per day and seven drinks per week; these thresholds may be lower for older adults taking medications. For men below the age of 65, at-risk drinking is defined as more than four drinks per day or 14 drinks per week. Given that loneliness has been considered a risk factor for alcohol abuse (Akerlind & Hornquist, 1992), the association between loneliness and

various levels of potentially problematic alcohol use merit examination. Persons who use alcohol within acceptable guidelines (i.e. low-risk drinkers) may have different experiences of loneliness compared to persons who misuse or abuse alcohol. Using data from a sample of middle-aged and older adults in the 2008 wave of the Health and Retirement Study (HRS), we examined the association between loneliness frequency and three outcomes: 1) average weekly frequency of alcohol use in the last three months; 2) at-risk drinking; and 3) binge drinking. This enabled the examination of the association of loneliness with a range of alcohol use levels distinct from alcohol abuse. We hypothesized that, after adjusting for potential confounders, adults who reported more frequent loneliness would more regularly consume alcohol and would more likely be at-risk and binge drinkers. Of note, we controlled for elevated depressive symptoms and current smoking status in order to examine the unique effects of alcohol use, at-risk drinking, and binge drinking associated with loneliness independent of these variables.

METHODS

Study

We performed a cross-sectional analysis of publicly available data from the 2008 wave of the HRS core data file (HRS website, 2013a). The HRS is a longitudinal population-based study of non-institutionalized adults living in the United States age 50 years and older, conducted by the University of Michigan and sponsored by the National Institute on Aging (grant number U01AG009740). The HRS, which began in 1992 and has been conducted biannually since, collects information on economic well-being, labor force participation, health, and family status in adults from pre-retirement into retirement (HRS website, 2013b; Heeringa, 1995). Additional details on the sample design and procedures have been described previously (HRS website, 2013b; Heeringa, 1995).

Participants

HRS participants were selected using a multi-stage probability sampling design (HRS website, 2013b; Heeringa, 1995). In order to improve representativeness of minorities, the study oversampled African Americans, Hispanics, and residents of Florida, and provided sampling weights for the entire 2008 HRS sample to account for the unequal probability of selection into the study (HRS website, 2013b; Heeringa, 1995).

After the completion of the in-person 2008 core HRS survey, a random sample of half of participants were given an additional questionnaire, known as the Psychosocial and Lifestyle Questionnaire, to complete on their own and return by mail (Smith et al., 2013). In the 2008 HRS, 7,062 participants completed the Psychosocial and Lifestyle Questionnaire. In order to focus on participants who self-identified as current drinkers (i.e. in the last three months), we excluded 18 participants who reported never having used alcohol; 3,527 participants who indicated that in the last three months they did not “ever drink any alcoholic beverages such as beer, wine, or liquor”; 1,194 participants who reported 0 or <1 drinking day per week on average in the last three months; 3 participants who reported 0 or <1 drinks on a drinking day in the last three months; 31 participants with an “unknown” or “refused” response to any of the drinking questions (ever drinking, number of days per week having consumed

alcohol, the number of drinks on a drinking day, or the number of days having consumed 4 or more drinks); 59 participants younger than 50 years or with missing age data; 126 who had a zero respondent-level weight; 3 who were in a nursing home; 74 who were "not cohort eligible this wave"; and 24 who had more than five loneliness items with missing values.

Our final sample consisted of 2004 adult ages 50 and older who reported drinking in the last 3 months. We compared our sample of 2004 adults to those who were excluded to identify between-group differences. Participants included in the analyses were more likely to be married, higher educated, and have fewer depressive symptoms, and were less likely to be female, older, Black and Other race, and have pain or any health condition (except for cancer diagnoses) compared to those excluded (all p's<0.05); no differences were found in BMI, cancer diagnoses, or smoking status between those included and those excluded from the current analyses.

Measures

Average weekly frequency of alcohol use in the last three months—Participants were asked about their frequency of drinking days per week: "In the last three months, on average, how many days per week have you had any alcohol to drink?" Responses ranged from 0 days per week (i.e. "none or less than once a week") to 7 average drinking days per week in the last 3 months. After excluding participants who reported 0 or <1 drinks on the days they drink alcohol, we categorized participants' average number of drinking days per week into tertiles (1 [reference group], 2–3, and 4–7 drinking days per week).

At-risk drinking—We created a dichotomous indicator indicating at-risk drinking based on the National Institute on Alcohol Abuse and Alcoholism (NIAAA, n. d.) drinking definition of a-risk drinking, using the average number of drinking days per week (see above description) and average number of drinks per drinking day, "In the last three months, on the days you drink, about how many drinks do you have?" After excluding 3 participants who reported 0 or <1 drinks on the days they drink alcohol, responses ranged from 1 to 16 average drinks per day and 1 to 112 average drinks per week.

Any participant aged 65 and older and all female participants who reported drinking an average of >7 drinks in a week, >3 drinks any day were categorized as at-risk drinkers. Male participants aged 50–64 who reported drinking an average of >14 drinks in a week or >4 drinks any day in the last 3 months, were categorized as at-risk drinkers. Participants were categorized as not at-risk drinkers if they reported drinking within the NIAAA guidelines for low-risk drinking. Based on these guidelines, 16.9% of participants were categorized as at-risk drinkers.

Binge drinking—Participants reported their binge drinking days: "In the last three months, on how many days have you had four or more drinks on one occasion?" Responses ranged from 0 to 92 days of drinking four or more drinks on one occasion in the last 3 months. Participants who reported at least one binge drinking day in the last 3 months (34.1%) were categorized as binge drinkers.

Loneliness frequency—Participants were asked an 11-item questionnaire adapted from the Revised University of California Los Angeles (UCLA) Loneliness Scale as part of the 2008 Psychosocial and Lifestyle Questionnaire (Smith et al., 2013; see Hughes et al., 2004 for design details) and all ratings were made on a three-point scale (1=often, 2=some of the time, 3=hardly ever or never). Responses to 4 items were reverse coded so that higher scores indicate greater loneliness: "How much of the time do you feel you lack companionship/left out/isolated from others/alone?" Participants were also asked "How much of the time do you feel in tune with the people around you/that there are people you can talk to/that there are people you can turn to/that there are people you feel close to/that there are people who really understand you/part of a group of friends/that you have a lot in common with the people around you?" Responses were averaged across the 11 items, resulting in loneliness scores ranging from 1 to 3. The final score was set to missing if there were more than five loneliness items with missing values (Smith et al., 2013). Finally, loneliness was mean centered in all analyses so that loneliness scores ranged from 0 to 2.

Depressive symptoms—Past-week depressive symptoms were assessed using a short form of the Center for Epidemiologic Studies Depression Scale (CES-D, Radloff, L. S. 1977). Of the eight total items, six items (past-week feelings of depression; loneliness; sadness; feeling everything was an effort; restless sleep; inability to get going) indicated depression and two items (past-week happiness; life enjoyment) suggested the absence of depression and were reverse coded. The loneliness item was not included in analyses, as in previous research (Cacioppo et al., 2006; Coyle & Dugan, 2012), in order to avoid item overlap. Participants replied "yes" or "no" to having felt the symptoms "much of the time" in the past week. Individuals endorsing four or more depressive symptoms were categorized as having elevated depressive symptoms, consistent with prior studies (Mojtabai & Olfson, 2004; Steffick, 2000).

Covariates—Participants reported their gender, age (which we categorized as 50–64, 65–74, 75–84, and 85+), race (categorized in the HRS as White, Black, or other), education level (which we categorized as less than high school, GED/high school diploma, some/completed college, or graduate degree), and marital status (which we dichotomized as married or other). We categorized body mass index (BMI) based on the World Health Organization (2014) guidelines: underweight (BMI: <18.5), normal weight (BMI: 18.5–24.9), pre-obese (BMI: 25–29.9), or obese (BMI: ≥30). Additionally, participants reported prior or current health conditions, including heart conditions, hypertension, stroke, memory-related disease, diabetes, cancer, arthritis, and pain, which were coded dichotomously (yes or no). Participants also indicated whether they were current smokers.

Statistical analyses

Contingency tables and Wald statistics were used to compare participant characteristics across loneliness scores. We used multinomial logistic regression to measure the association between tertiles of drinking days per week (outcome) and loneliness (predictor). We fit two separate models. Model I controlled for demographic characteristics, including gender, age, race, educational level, and marital status, as well as current cigarette smoking and health conditions: heart conditions, hypertension, stroke, memory-related disease, diabetes, cancer,

arthritis, and pain. Model II controlled for all variables in Model I as well as elevated depressive symptoms. Subsequently, we ran logistic regression models to measure the association between at-risk drinking (outcome) and loneliness (predictor) to determine whether loneliness was associated with higher odds of at-risk drinking. We fit two models controlling for the variables in Models I and II described above. We then ran logistic regression models to measure the association between binge drinking (outcome) and loneliness (predictor) to determine whether loneliness was associated with binge drinking, fitting two models that control for the variables in Models I and II described above. Individual-level survey weights were applied to all analyses to account for the unequal probability of participants' selection into the HRS and completion of the 2008 Psychosocial and Lifestyle Questionnaire (Smith et al., 2013). Model-wise deletion was used to address missing covariate values. Analyses also took account of clustering and stratification of the data. Data were analyzed using Stata version 13 SE (StataCorp, 2013).

RESULTS

The study sample (n=2004) ranged in age from 53 to 96 years (mean age ± standard error = 64.93 ± 0.24). Participants were primarily male (56.9%), White (89.4%), married (68.1%), and had a GED/high school diploma (48.8%). Participants were primarily pre-obese (42.7%), and reported arthritis (52.6%) and hypertension (50.2%). More than a quarter of participants reported pain (27.7%), 19.3% reported a heart condition, 15.1% reported current smoking, and 8.4% reported elevated depressive symptoms (Table 1).

Overall, 373 participants (17.9%) had a mean score of 0 on the loneliness scale (i.e., hardly ever or never lonely), 1413 participants (70.0%) had a mean score of 0.01–1 on the loneliness scale (i.e., lonely some of the time), and 218 participants (12.1%) had a mean score of 1.01–2 on the loneliness scale (i.e., often lonely); the overall mean loneliness score was 0.47. Being White married, and having cancer were statistically significantly associated with lower scores of loneliness. Being male, age 50–64 years old, more educated, having memory problems, pain, or elevated depressive symptoms were statistically significantly associated with higher scores of loneliness (Table 1).

In the last three months, 31.4% of participants reported drinking alcohol on average one day each week, 30.5% reported drinking alcohol 2–3 days each week, and 38.1% reported drinking alcohol 4–7 day each week. Average frequency of alcohol use was statistically significantly associated with mean loneliness scale score: 43.2% of respondents who drank an average of 4–7 days each week scored hardly ever or never lonely, compared to 38.7% who scored lonely some of the time, and 27.4% who scored often lonely. A reverse pattern was observed for participants who reported drinking 1 day per week: fewer respondents who drank an average of 1 days each week scored hardly ever or never lonely (23.9%) compared to some of the time lonely (32.1%) and often lonely (38.9%).

Among at-risk drinkers, who made up 16.9% of participants, 18.7% scored hardly ever or never lonely, 16.6% scored lonely some of the time, and 15.7% scored often lonely. Among binge drinkers, who made up 34.1% of participants, 32.8% scored hardly ever or never lonely, 33.1% scored lonely some of the time, and 41.7% scored often lonely (Table 1).

Loneliness was statistically significantly associated with drinking an average of 4–7 days per week versus 0 days per week in the last 3 months after adjusting for gender, age, race, marital status, education level, smoking, pain, BMI, and health conditions in Model I (adjusted relative odds ratio [aROR]=0.71, 95% CI=0.51–0.99, *p*-value=0.041) and after adjustment for elevated depressive symptoms in Model II (aROR=0.68, 95% CI=0.48–0.95, *p*-value=0.026) (Table 2). For each one-point increase in the mean loneliness score, there is a 32% decrease in the odds of drinking an average of 4–7 days per week versus 0 drinking days per week. In other words, as respondents indicate more frequent feelings of loneliness, there is a reduced odds of drinking in the most frequent tertile.

No association was found with loneliness and drinking an average of 1–3 days per week versus 0 drinking days per week in the last 3 months. Loneliness was also not associated with at-risk drinking or with binge drinking (Table 2).

DISCUSSION

This study sought to expand the existing literature on the relationship between various levels of alcohol use and frequency of loneliness. We used a cross-sectional community-based sample of adults aged 50 and older to examine whether loneliness predicted three distinct alcohol use-related outcomes: 1) average weekly frequency of alcohol use in the last three months; 2) at-risk drinking; and 3) binge drinking. We found that, on average, 12.1% of participants reported loneliness often, 70% reported loneliness some of the time, and 17.9% reported loneliness hardly ever or never. Our findings are higher than previous estimates of older adults who report being “always” (2%), “often” (5%), or “sometimes” (31%) lonely (Victor et al., 2005). We found that being lonely was associated with less frequent drinking, but there was no difference in at-risk or binge drinking between lonely and non-lonely participants after controlling for demographic characteristics, health conditions, smoking, and elevated depressive symptoms. These findings offer an alternative perspective to prior research that has implicated loneliness as a risk factor for problematic alcohol use (Akerlind & Hornquist, 1992).

We offer some possible explanations for our findings. First, we examined average weekly alcohol use, at-risk drinking, and binge drinking among self-reported drinkers; we did not examine clinically defined alcohol abuse, which has been the focus of previous research reporting a positive association between alcohol abuse and loneliness (Akerlind & Hornquist, 1992). Of note, persons may drink every night, yet not be drinking problematically. The relationship we observed between alcohol use and loneliness may not have persisted had we been able to control for the presence of alcohol use disorders, but such data were not collected in the HRS. Future research should explore whether there is a threshold level at which being lonely can lead to abusive alcohol consumption. There are significant clinical implications to understanding whether loneliness is one possible avenue by which people progress from alcohol use to abuse.

Another possible explanation for the association we observed between more frequent alcohol use and decreased loneliness is that alcohol can cultivate an environment of “friendship and togetherness” (Segal, 1987, p. 303). Regardless of whether people are lonely

or have deep, meaningful relationships, they may be less likely to report loneliness if they have established connections with others who drink. Rather than assuming that people drink to alleviate negative factors, such as loneliness, isolation, and anxiety, individuals may drink because they are happy and expect positive outcomes from alcohol consumption (Segal, 1987).

Third, in certain settings, alcohol use has been described as a “social facilitator” (Akerlind & Hornquist, 1992, p. 405) and is a beverage commonly enjoyed during experiences of social contact (Pettigrew & Roberts, 2008). Such beverage consumption rituals offer another possible mechanism by which we can explain our observed relationship between alcohol use and loneliness. For instance, pubs are places where persons of all ages can share food and drink and discuss current events with peripheral social network members; pubs are locations where community-dwelling older adults can maintain social support (Buz, Sanchez, Levenson, & Aldwin, 2014). Research with older adults in retirement community settings has found that socially isolated adults in retirement communities are less likely to regularly consume alcohol and drink heavily than residents who were more social; in these settings, drinking is “an integral part of the leisure subculture” (Alexander & Duff, 1988, p. 632). It would serve to reason that, for some adults, engaging in social contact reduces isolation and that reduced isolation, in turn, lessens feelings of loneliness. Future research should use formal meditation analyses to formally test this hypothesis. While socialization may be an important method to reduce loneliness among middle-aged and older adults, instances that involve excessive alcohol consumption should be limited.

The types and nature of relationships people have are noteworthy influences on drinking behavior as social networks remain an important influence on alcohol use and peers continue to set drinking norms into late life (Akers, la Greca, Cochran, & Sellers, 1989). For instance, Platt and colleagues (2010) identified alcohol consumption trajectories over a 14-year period in adults aged 50 and older and found that more frequent socialization with neighbors was associated with increases in drinking over time. Additionally, people whose friends drink more frequently will consume more alcohol than people whose friends drink less; and abstainers are often connected to other abstainers (Rosenquist, Murabito, Fowler, & Christakis, 2010). Our study excluded abstainers in order to focus on individuals reporting alcohol use in the last three months.

Some limitations should be noted. For instance, the cross-sectional study design did not allow for causal inferences, thus we cannot know if participants had previously been lonely and as a result consumed alcohol and became less lonely. Additionally, as noted, the HRS does not have data on alcohol use disorders. To address this limitation, we created an indicator of at-risk drinking based on NIAAA guidelines, tailored by age and gender. Future research should explore patterns of both alcohol use and abuse over time in response to loneliness.

Although existing literature suggests that older adults with problematic alcohol consumption drink at home or while alone (Schonfeld & Dupree, 1991), we were unable to determine this information based on the data available. Future research should investigate common drinking locations in mid- and late-life, as well as consumption times throughout the day.

Explorations of how middle-aged and older adults relate to alcohol in social settings and while alone are needed. Finally, our sample primarily consisted of White participants, so our findings could have limited generalizability to other ethnic or racial groups. Considerations regarding how persons of different cultural backgrounds conceptualize loneliness and its relation to alcohol use are important when planning interventions to reduce loneliness. For instance, research with older Chinese adults living in the U.S. suggests that loneliness stems from the lack of intergenerational relationships and intimate partnerships (Dong, Chang, Wong, & Simon, 2012).

Despite these limitations, there is great value in understanding associations between varying levels of alcohol use and loneliness frequency in middle-aged and older adults beyond alcohol abuse, as we have currently done. While we found that persons who were more lonely drank less frequently than those who were less lonely, we do not suggest that loneliness should be prevented with alcohol use. It has been recommended that older adults limit their alcohol intake to a maximum of three drinks on a given day and to no more than seven drinks in a week (NIAAA, n. d.). Although previous research has found some benefits associated with moderate alcohol consumption in middle-aged and older adults (Balsa, Homer, Fleming, & French, 2008; Lang, Wallace, Huppert, & Melzer, 2007), future research should seek to understand how feelings of loneliness affect the levels, frequencies, and patterns of alcohol use that are most beneficial for middle-aged and older adults. Though eating and drinking rituals as part of social engagement have been found to reduce loneliness, so too have reading, gardening, and relying on family and friends as an emotional resource (Pettigrew & Roberts, 2008) as well as the introduction of new technologies to older adults (Hagan, Manktelow, Taylor, & Mallett, 2014). Additionally, group interventions, particularly those in which older persons can be involved in the planning and development phases, have been effective in alleviating and preventing social isolation and loneliness (Cattan, White, Bond, & Learmouth, 2005).

CONCLUSION

Building upon previous research, which has found positive associations between alcohol abuse and loneliness, we found that less frequent alcohol use among middle-aged and older adult drinkers was associated with feelings of loneliness; problematic drinking patterns, including at-risk drinking and binge drinking, were not associated with feelings of loneliness. While remaining actively engaged with friends and children in late life is an important factor in reducing loneliness (Pettigrew & Roberts, 2008), such social engagements should not compromise healthy behaviors. Middle-aged and older persons should be mindful of age-related physical changes, understand how these changes can impact the effect alcohol has on their health, and abide by recommended levels of alcohol use. Additionally, health care providers should remain vigilant of the influence of social groups on patients' behaviors, including daily drinking amounts, regardless of age and discuss methods by which patients can reduce and prevent loneliness and isolation.

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Table 1

Participant characteristics by frequency of loneliness feelings: Health and Retirement Study, 2008[a]

Demographic	Total Sample N (%)	Feelings of Loneliness[b] Hardly ever or never N (%)	Sometimes N (%)	Often N (%)	p-value[c]
Total sample	2004 (100.0)	373 (17.9)	1413 (70.0)	218 (12.1)	
Drinking frequency					0.002
1 day per week	617 (31.4)	86 (23.9)	450 (32.1)	81 (38.9)	
2–3 days per week	599 (30.5)	118 (33.0)	418 (29.3)	63 (33.7)	
4–7 days per week	788 (38.1)	169 (43.2)	545 (38.7)	74 (27.4)	
At-risk drinking	430 (16.9)	90 (18.7)	294 (16.6)	46 (15.7)	0.633
Binge drinking	587 (34.1)	105 (32.8)	411 (33.1)	71 (41.7)	0.156
Age					0.010
50–64	726 (58.7)	124 (56.6)	511 (57.9)	91 (65.9)	
64–75	734 (24.2)	157 (28.1)	507 (24.1)	70 (18.9)	
75–84	444 (13.9)	80 (13.4)	313 (14.1)	51 (13.8)	
85+	100 (3.3)	12 (1.9)	82 (3.9)	6 (1.5)	
Gender					<0.001
Male	1064 (56.9)	168 (46.9)	765 (57.9)	131 (65.6)	
Female	940 (43.1)	205 (53.1)	648 (42.1)	87 (34.4)	
Race					0.039
White	1772 (89.4)	346 (93.2)	1236 (89.2)	190 (84.7)	
Black	177 (7.2)	21 (4.1)	132 (7.0)	24 (12.5)	
Other	55 (3.4)	6 (2.6)	45 (3.7)	4 (2.9)	
Marital status					<0.001
Married	1374 (68.1)	300 (80.7)	948 (66.9)	126 (56.6)	
Other	630 (31.9)	73 (19.3)	465 (33.1)	92 (43.4)	
Education					<0.001
<High school	237 (8.8)	19 (3.6)	185 (10.0)	33 (9.7)	
GED/HS diploma	1017 (48.8)	181 (46.4)	722 (48.9)	114 (51.3)	
Some/compl. college	459 (25.7)	101 (29.7)	306 (23.8)	52 (30.5)	
Graduate degree	291 (16.7)	72 (20.4)	200 (17.2)	19 (8.5)	

Demographic	Total Sample N (%)	Feelings of Loneliness [b] Hardly ever or never N (%)	Sometimes N (%)	Often N (%)	p-value[c]
BMI					0.782
Underweight	22 (1.1)	1 (0.6)	17 (1.1)	4 (1.8)	
Normal	627 (29.1)	122 (30.8)	442 (29.3)	63 (25.5)	
Pre-obese	838 (42.7)	153 (41.5)	597 (43.2)	88 (41.6)	
Obese	517 (27.2)	97 (27.1)	357 (26.5)	63 (31.1)	
Current smoker	274 (15.1)	42 (14.0)	196 (14.6)	36 (19.8)	0.308
Health conditions[d]					
Heart condition	459 (19.3)	87 (17.0)	322 (19.5)	50 (21.8)	0.425
Hypertension	1106 (50.2)	189 (44.4)	800 (51.7)	117 (50.4)	0.113
Memory problems	29 (1.3)	1 (0.2)	18 (1.1)	10 (4.4)	0.003
Stroke	93 (4.1)	11 (3.8)	69 (4.0)	13 (5.2)	0.805
Diabetes	270 (12.0)	40 (10.6)	192 (11.7)	38 (15.9)	0.292
Cancer	331 (14.0)	55 (11.9)	242 (15.4)	34 (9.7)	0.023
Arthritis	1175 (52.6)	213 (52.0)	836 (52.7)	126 (52.6)	0.983
Pain	553 (27.7)	76 (18.7)	392 (28.0)	85 (39.6)	<0.001
Elevated Depressive Symptoms	154 (8.4)	6 (2.1)	97 (7.3)	51 (24.4)	<0.001

[a] Participants responding to Psychosocial and Lifestyle Questionnaire, from the 2008 HRS, not the full 2008 HRS sample.

[b] All percentages correspond to column totals and are corrected to account for complex sampling design and unequal probabilities of participant selection. Feelings of loneliness represent the average scale score of up to 11 items in the UCLA Loneliness Scale. Mean scale scores of zero indicate “hardly ever/never” lonely, greater than 0 up to 1 indicate “sometimes” lonely, and greater than 1 up to 2 indicate “often” lonely.

[c] p-value corresponds to the Wald statistic corrected for the complex sampling design and unequal probabilities of participant selection.

[d] Column percentages do not add up to 100% since participants with each health condition are compared to all other participants in the study. For example, individuals with a heart condition are compared to participants who never experienced a heart condition.

Table 2

Multinomial logistic regressions examining the relationship between alcohol use outcomes (i.e. drinking frequency, at-risk drinking, and binge drinking) and loneliness; Health and Retirement Study, 2008

Alcohol use outcomes	Model I aROR (95% CI)[a]	Model II aROR (95% CI)[b]
Drinking frequency		
1 day per week	1.00 (ref)	1.00 (ref)
2–3 days per week	0.93 (0.66, 1.31)	0.99 (0.69, 1.40)
4–7 days per week	0.71 (0.51, 0.99)*	0.68 (0.48, 0.95)*
At-risk drinking		
No	1.00 (ref)	1.00 (ref)
Yes	0.81 (0.56, 1.17)	0.69 (0.46, 1.03)
Binge drinking		
No	1.00 (ref)	1.00 (ref)
Yes	0.99 (0.73, 1.34)	1.00 (0.73, 1.38)

[a] N = 2002 for Model I; Adjusted for gender, age, race, marital status, education, cigarette smoking, BMI, heart condition, hypertension, stroke, memory-related disease, diabetes, cancer, arthritis, and pain.

[b] N = 1987 for Model II; Adjusted for same variables as Model I as well as elevated depressive symptoms.

All odds ratios account for the complex survey design and are weighted.

* $p<0.01$