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Journal

American Journal of Geriatric Psychiatry, 22(11)

ISSN

1064-7481

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Publication Date

2014-11-01

DOI

10.1016/j.jagp.2013.07.005

Peer reviewed

Published in final edited form as:
Am J Geriatr Psychiatry. 2014 November ; 22(11): 1356–1363. doi:10.1016/j.jagp.2013.07.005.

Psychiatric Correlates of Alcohol and Tobacco Use Disorders in U.S. Adults Aged 65 Years and Older: Results from the 2001–2002 National Epidemiologic Survey of Alcohol and Related Conditions

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Abstract

Objectives—To examine associations of alcohol and tobacco use disorders and psychiatric conditions among older U.S. adults.

Methods—Sample included individuals ≥65 years (n=8205) who participated in the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Measurements included lifetime and past 12-month DSM-IV alcohol use disorders (AUDs), tobacco use disorders (TUDs), and psychiatric conditions.

Results—Among older adults, prevalence of lifetime and past 12-month AUDs were 16.1% and 1.5%, and lifetime and past 12-month TUDs were 8.7% and 4.0%, respectively. Lifetime TUD was associated with increased odds of both lifetime (OR 4.17; 95% CI 3.30–5.26) and past 12-month (OR 2.52; 95% CI 1.50–4.24) AUDs, and lifetime AUD was associated with increased odds of both lifetime (OR 4.13; 95% CI 3.28–5.210 and past 12-month (OR 3.51; 95% CI 2.47–4.96) TUDs. Any lifetime mood, anxiety, or personality disorder among older adults was associated with increased odds of lifetime AUD and TUD, any lifetime mood disorder was associated with increased odds of past 12-month AUD and TUD, and any personality disorder was associated with past 12-month TUD.

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No Disclosures to Report

Conclusion—There is a strong association between AUD and TUD among older U.S. adults, as well as associations between AUD and TUD with mood, anxiety, and personality disorders. Understanding the psychiatric conditions associated with AUDs and TUDs, especially past 12-month use disorders involving alcohol or tobacco, will enable healthcare providers to target their screening and be more aware of symptoms and signs of potential AUDs and TUDs among those who may be at higher risk.

Keywords

Alcohol use disorders; Tobacco use disorders; Psychiatric correlates; Older adults

INTRODUCTION

Older adults are a rapidly growing segment of the U.S. population and are projected to increase from 12.4% to 19.6% of the population by 2030 (1). Older adults have lower rates of both substance use and substance use disorders compared to younger adults (2–6). However, this discrepancy may partly be explained by the increased mortality among individuals who have substance use disorders compared to those without such disorders (7, 8), and by under-reporting or under-detection of substance use disorders among older adults compared to the general adult population (9–11). Also, substance use disorders may be associated with greater health risks among older adults because of factors such as age-related physiological changes, increased brain sensitivity to alcohol and drugs, more comorbid medical conditions, and increases in use of medications that might adversely interact with substance use (3, 12–14). When considering both amount of alcohol use and existing comorbidities in determining at-risk drinking, Moore et al. (2006) found that approximately 10% of older adults could be classified as at-risk drinkers and such drinking was associated with increased risk for mortality (13). Moreover, the higher rates of substance use among the Baby Boomer cohort (individuals born between 1946 and 1964) raises concern for a potential rise in the number of substance use disorders among older adults in the near future (15–17).

Alcohol use disorders (AUDs) and tobacco use disorders (TUDs) co-occur in both the general and the older adult population (2, 3). This combination may be especially harmful because the combined health risks of concurrent AUDs and TUDs have been found to be greater than the sum of the independent risks (18–21). Studies have found that having an AUD was associated with both lifetime and past year tobacco use, and alcohol dependence increased risk of nicotine dependence by more than 11 times in men and 16 times in women (3, 22). Compared to adults aged 50 years and older who used alcohol, those with an AUD had increased odds of also having nicotine dependence (2). Tobacco use in alcohol-dependent younger adults has been associated with greater severity of alcohol dependence, and smokers consumed more alcohol and had higher risks for AUD compared to never-smokers (19, 23). Adult smokers who engaged in frequent binge drinking (≥5 drinks per occasion) reduced their odds of success in smoking cessation by 42%, and the negative effect of AUD on the likelihood of successful smoking cessation appeared to increase with age (22).

In the general population, AUDs and TUDs are also associated with other substance use disorders and psychiatric conditions (3, 19, 22–26). Alcohol abuse and dependence are strongly associated with drug use, nicotine dependence, and multiple psychiatric disorders (3, 22, 24). Studies have found that adults with major depressive disorder were more likely to have both alcohol and drug dependence, and history of prior DSM-IV alcohol dependence increased the odds of having past 12-month depression by more than four times (27, 28). This association with alcohol dependence and major depression has also been observed in adults aged 50 years and older (2).

To better understand the prevalence and psychiatric correlates of lifetime and past 12-month alcohol and tobacco use disorders among adults 65 years and older, this study examined data among older adults in the 2001–2002 National Institute on Alcohol Abuse and Alcoholism (NIAAA) National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (29). The objective of this study is to advance prior research by conducting focused analyses of the psychiatric correlates of alcohol and tobacco use disorders in older adults and to conduct these analyses by gender and age using a national survey that is representative of the U.S. older adult population.

METHODS

Study Sample

The sample included 8,205 individuals aged 65 years and older from the NIAAA sponsored 2001–2002 NESARC, a population-based survey representative of the U.S. civilian, non-institutionalized adult population 18 years and older (29). Face-to-face interviews were conducted with 43,093 respondents, and the overall response rate was 81%. Blacks, Hispanics, and young adults aged 18–24 were oversampled, and weighted data were adjusted to be representative of the U.S. civilian population based on the 2000 Census. The research protocol received ethical review and approval from the U.S. Census Bureau and U.S. Office of Management and Budget.

Alcohol and Tobacco Use Disorders

Lifetime and past 12-month diagnoses of alcohol and tobacco use disorders were determined by the Alcohol Use Disorder and Associated Disabilities Interview Schedule DSM-IV Edition (AUDADIS-IV) (30). AUD was defined as meeting criteria for either alcohol abuse or dependence (24). Using AUDADIS –IV, diagnoses of alcohol abuse require the respondent to meet one or more of the four DSM-IV abuse criteria in the 12-month period preceding the interview (12-month diagnoses) or during any previous 12-month period (lifetime diagnoses). Diagnoses of alcohol dependence require three or more of the seven DSM-IV dependence criteria. TUD was defined as meeting criteria for nicotine dependence (i.e., respondent must meet at least 3 of the 7 DSM-IV dependence criteria) (25). The reliability of AUDADIS-IV for AUDs and TUDs have been shown to be good to excellent in the general population sample (31, 32).

Psychiatric Conditions

The AUDADIS-IV was used to determine diagnoses of mood, anxiety, and personality disorders. The reliability of AUDADIS-IV mood, anxiety, and personality disorders has been shown to be fair to good in the general population (31, 32). Aggregate variables were constructed to indicate whether an individual had any of the mood, anxiety, or personality disorders listed as follows. Mood disorders included major depressive disorder, dysthymia, bipolar I, and bipolar II disorder. Anxiety disorders included panic disorder, specific phobia, social phobia, and generalized anxiety disorder. Personality disorders included avoidant, dependent, obsessive-compulsive, paranoid, schizoid, histrionic, and antisocial personality disorder. To meet criteria for diagnoses of DSM-IV personality disorders, individuals must have the necessary number of symptoms for the particular personality disorder, and at least one symptom associated with social or occupational impairments (33).

Sociodemographic Variables and Self-reported Health Status

Sociodemographic variables examined included age (65–74 years, 75 years and older), gender, race/ethnicity (White, Hispanic/Latinos, Asians/Pacific Islanders, American Indians/Alaskan Natives, or Blacks/African Americans), marital status (married/living with someone, widowed/divorced/separated, or never married), education (<12^{th} grade, high school graduate/GED, or some college or higher), employment status (employed or not employed), and annual family income (<$20,000, $20,000–34,999, ≥$35,000). Self-reported health status (excellent/very good, good, or fair/poor) was also included.

Statistical Analyses

We calculated prevalence estimates of lifetime and past 12-month AUDs and TUDs, mood, anxiety, and lifetime personality disorders for the entire sample and by gender and age group. Percentages were weighted to be representative of the U.S. civilian population based on the 2000 census.

Multiple logistic regression analyses, controlling for sociodemographic, self-perceived health status, and all lifetime DSM-IV AUDs and TUDs and psychiatric conditions, were used to derive adjusted odds ratios (ORs) and 95% CIs to address the study objective of examining associations of psychiatric conditions with both lifetime and past 12-month AUDs and TUDs in older adults. We also conducted these regressions stratified by age group and gender. For the analyses, we omitted the Asians/Pacific Islanders and the American Indians/Alaskan Native racial groups as there were too few persons in these categories for the statistical models to fit. Hosmer-Lemeshow tests were calculated to determine goodness-of-fit on all multiple logistic regression models (34). All analyses were performed using SUDAAN, which adjusts for the complex sample survey design characteristics used in NESARC (35).

RESULTS

Prevalence of Alcohol and Tobacco Use Disorders and Psychiatric Conditions

Among the sample aged 65 years and older, 45.5% were at least 75 years of age, 58% were female, 82.2% were White, and 35.6% rated their health status as very good to excellent

(36). Approximately 16% of older adults had a lifetime AUD and 9% had a lifetime TUD. (Table 1) Thirty percent of men, about 6% of women, 20% of those aged 65 to 74 years and 11% of those aged 75 years and older had a lifetime AUD. Eleven percent of men, 7% of women, 11% of those aged 65 to 74 years and 5% of those aged 75 years and older had a lifetime TUD. With the exception of those aged 65–74 years, fewer than 5% of the older adult sample had an AUD or a TUD in the past 12 months.

Approximately 12% of older adults met criteria for any lifetime mood disorder, 12% for any anxiety disorder, and 8% for any personality disorder. (Table 1) Approximately 9% of men, 15% of women, 14% of those aged 65 to 74 years and 10% of those aged 75 years and older had a lifetime mood disorder and similar percentages of men and women and younger and older age groups had a lifetime anxiety disorder. Between 8–9% of men and women and younger and older age groups had a personality disorder.

For the past 12 months, approximately 5% of older adults met criteria for any mood disorder and 7% for any anxiety disorder (Table 1). There was little variation in the percentages of men and women and younger and older age groups in these rates.

Among specific psychiatric diagnoses, the most common mood disorder for both lifetime and past 12-months among older adults was major depressive disorder, followed by dysthymia, bipolar I, and bipolar II. The most common anxiety disorder for both lifetime and past 12-months among older adults was specific phobia. The most common personality disorder among older adults was obsessive-compulsive (Table 1).

Associations between Alcohol and Tobacco Use Disorders and Psychiatric Conditions

There was a strong association between lifetime TUDs and lifetime and past 12-month AUDs among older adults. Lifetime TUD was associated with a four times increased odds of lifetime AUD, and two and half times increased odds of past 12-month AUD. Men and women with lifetime TUD had at least twice the odds of lifetime and past 12-month AUD. This was also true for all ages with the exception of those aged 75 years and older with lifetime TUD who did not have increased odds of having a past 12-month AUD (Table 2).

Those having lifetime mood and anxiety disorders or any personality disorder also had somewhat increased odds of having a lifetime AUD and but only those having a lifetime mood disorder had statistically significant increased odds of having a past 12-month AUD (Table 2). There were modest increases in odds for having a lifetime or past 12-month AUD among women with any lifetime mood disorder. Men with any lifetime anxiety disorder or any personality disorder also had modest increases in the odds of having a lifetime AUD. Those in the younger age group having lifetime AUD had increased odds of having any of the other psychiatric diagnoses but those in the older age group did not. There were no statistically significant associations with any psychiatric disorder among those in the two age groups having a past 12 month AUD.

Similar to the estimates in Table 2, there was a strong association between having a lifetime AUD and having a lifetime or past 12 month TUD among older adults (Table 3). Lifetime AUD was associated with a four times increased odds of lifetime TUD, and three and half

times increased odds of past 12-month TUD. Men and women with lifetime AUD had more than three times the odds of lifetime and past 12-month TUD. This was also true for those aged 65–74 years and those aged 75 years and older (Table 3). Those having lifetime mood and anxiety disorders and any personality disorder also had somewhat increased odds of having a lifetime TUD and but only those having a lifetime mood disorder or any personality disorder had statistically significant increased odds of having a past 12 month TUD (Table 3).

There were modest increases in odds for having a lifetime TUD among men with lifetime anxiety disorder and any personality disorder and among women with any lifetime mood or anxiety disorder or personality disorder. Both age groups had similar increases in odds for lifetime TUD for all psychiatric diagnoses with the exception of those aged 75 years and older who did not have increased odds for any lifetime anxiety disorder. For past 12 month TUD, only those in the age group 65 to 74 years and higher odds of any lifetime mood disorder.

Psychiatric correlates of lifetime and past 12-month AUDs and TUDs were similar in some respects. Older adults with any lifetime mood disorder have higher odds of both lifetime and past 12-month AUDs and TUDs compared to those without any mood disorder. Individuals with any lifetime anxiety or personality disorders have higher odds of lifetime AUDs and TUDs compared to those without any anxiety or personality disorder (Tables 2 and 3).

DISCUSSION

The interplay between alcohol and tobacco use in the general adult population has been examined extensively in the literature, although few studies have examined the interaction between AUDs and TUDs exclusively among the older population (2). This study found that, among adults aged 65 years and older in the U.S., surveyed between 2001–2002, having a lifetime AUD was associated with increased odds of having both lifetime and past 12-month TUDs, and having a lifetime TUD was associated with increased odds of having both lifetime and past 12-month AUDs. These findings mimic those seen in general adult populations (3) and make clear the need to screen for tobacco use among older alcohol users and alcohol use among older tobacco users to minimize harmful effects of substance use among older adults.

Though not as strong, we also noted associations between psychiatric conditions and lifetime AUDs and TUDs, and also between lifetime mood disorders and past 12-month AUDs and TUDs. Having a personality disorder was also associated with increased odds of having a past 12-month TUD. There were both similarities and differences in our results compared to studies that evaluated psychiatric correlates of AUDs and TUDs in the general adult population (24, 25). When examining the adjusted odds ratios of 12-month AUDs and other psychiatric disorders using NESARC data, Hasin et al. noted small though statistically significant associations for any mood (OR 1.4; 95% 1.13–1.79), anxiety (OR 1.3; 95% CI 1.05–1.59) and personality (OR 1.4; 95% CI 1.18–1.66) disorder. (24) We found similar odds ratios but statistically significant findings were observed only for anxiety disorders, possibly due to the much smaller sample size of older adults. For past 12-month tobacco use

disorder, there were larger differences observed between the general adult population and older adults (25). When examining the odds ratios of 12-month TUD and other psychiatric disorders using NESARC data, Grant et al. noted stronger associations between past 12-month tobacco use disorder and all psychiatric conditions in the general adult population (ORs ranged from 2.3–5.7) compared to associations we observed in older adults (ORs ranged from 1.09–1.86). These differences may be due, at least in part, to the increased mortality associated with cigarette smoking (8).

Study limitations, some common to all observational studies, include recall bias, social undesirability of reporting, and under-detection of substance use disorders that may contribute to under-reporting. These factors may especially impact older populations, because the prevalence of substance abuse and dependence in older adults is often under-detected or under-reported (10, 11). The cross-sectional design of this study is another limitation; however, data from the follow-up NESARC wave 2 will enable evaluation of the longitudinal patterns and psychiatric correlates of AUDs and TUDs among older adults in future studies. Also, the longitudinal data may enable the evaluation of substance-related morbidity and mortality in the older population. Finally, these findings are only descriptive of the non-institutionalized U.S. older adults in 2001–2002, who are likely to be less impaired than those who are institutionalized, and other studies are needed to examine substance use disorders in more recent times and in other settings and countries for further generalization.

In conclusion, these data add to the knowledge of comorbid AUDs and TUDs in adults 65 years and older, a rapidly growing portion of the U.S. population, and help elucidate the psychiatric correlates of these substance use disorders. Understanding the psychiatric conditions associated with AUDs and TUDs, especially past 12-month use disorders involving alcohol or tobacco, will enable healthcare providers to target their screening and be more aware of symptoms and signs of potential AUDs and TUDs among those who may be at higher risk.

Acknowledgments

Sources of Funding: National Institute on Drug Abuse (R01DA020944), the National Institute on Alcoholism and Alcohol Abuse (K24AA15957), the National Institute on Aging (P30AG028748) and VA Special Fellowship in Advanced Geriatrics. Funding sources had no role in study design, data collection, analysis and interpretation of data, writing of the report, or decision to submit the paper for publication.

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Table 1

Prevalence of Alcohol and Tobacco Use Disorders and Psychiatric Conditions Among Adults Aged 65 Years and Older[a]

	Lifetime, N (weighted %)					Past 12-Months, N (weighted %)				
	All N=8205	**Male N=3104**	**Female N=5105**	**Age 65–74 N=4301**	**Age 75+ N=3904**	**All N=8205**	**Male N=3104**	**Female N=5105**	**Age 65–74 N=4301**	**Age 75+ N=3904**
Alcohol use disorder	1202 (16.1)	924 (30.2)	278 (5.9)	809 (20.2)	393 (11.3)	109(1.5)	86 (2.8)	23 (0.5)	86 (1.5)	23 (0.6)
Tobacco use disorder	663 (8.7)	329 (10.9)	334 (7.0)	461 (11.4)	202 (5.4)	324 (4.0)	145 (4.5)	179 (3.7)	239 (5.6)	85 (2.2)
Any mood disorder	1012 (12.0)	275 (8.6)	737 (14.5)	616 (13.7)	396 (10.0)	408 (4.7)	122 (3.7)	286 (5.4)	234 (4.9)	174 (4.5)
Major depressive disorder	874 (10.5)	228 (7.2)	646 (12.8)	529 (11.7)	345 (8.9)	323 (3.7)	95 (2.9)	228 (4.3)	182 (3.8)	141 (3.6)
Dysthymia	268 (3.2)	67 (2.2)	201 (3.9)	161 (3.5)	107 (2.8)	131 (1.6)	33 (1.1)	98 (1.9)	78 (1.6)	53 (1.5)
Bipolar I	103(1.1)	39 (1.1)	64 (1.1)	71 (1.4)	32 (0.7)	43 (0.5)	17 (0.5)	26 (0.5)	29 (0.5)	14 (0.4)
Bipolar II	50 (0.6)	17 (0.5)	33 (0.6)	34 (0.8)	16 (0.3)	20 (0.2)	7 (0.2)	13 (0.3)	12 (0.3)	8 (0.2)
Any anxiety disorder	990 (12.2)	265 (8.5)	725 (14.9)	580 (13.9)	410 (10.2)	589 (7.1)	142 (4.6)	447 (9.0)	347 (8.2)	242 (5.8)
Panic disorder	241 (3.2)	70 (2.2)	171 (3.8)	150 (3.5)	91 (2.8)	72 (0.9)	19 (0.6)	53 (1.2)	45 (1.0)	27 (0.9)
Specific phobia	514 (6.1)	123 (3.7)	391 (7.9)	305 (7.3)	209 (4.7)	383 (4.5)	87 (2.8)	296 (5.8)	226 (5.4)	157 (3.5)
Social phobia	230 (3.0)	73 (2.6)	157 (3.3)	124 (3.4)	106 (2.6)	123 (1.6)	32 (1.1)	91 (1.9)	67(1.7)	56 (1.5)
Generalized anxiety	252 (3.0)	51 (1.6)	201 (3.9)	142 (3.0)	110 (2.9)	99 (1.1)	17 (0.5)	82 (1.6)	62 (1.3)	37 (0.9)
Any personality disorder	641 (8.1)	271 (9.1)	370 (7.4)	358 (8.4)	283 (7.7)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Avoidant	68 (0.8)	23 (0.7)	45 (0.9)	34 (0.8)	34 (0.9)					
Dependent	23 (0.3)	5 (0.1)	18 (0.4)	9 (0.1)	14 (0.5)					
Obsessive-compulsive	392 (5.3)	167 (6.1)	225 (4.7)	223 (5.6)	169 (4.8)					
Paranoid	166 (1.8)	50 (1.3)	116 (2.0)	97 (1.9)	69 (1.6)					
Schizoid	149(1.7)	70 (2.2)	79 (1.3)	83 (1.6)	66 (1.8)					
Histrionic	51 (0.6)	20 (0.5)	31 (0.6)	27 (0.5)	24 (0.7)					
Antisocial	41 (0.6)	37 (1.3)	4 (0.1)	28 (0.8)	13 (0.4)					

[a]Sample sizes are un-weighted numbers; percentages are weighted to be representative of the U.S. civilian population based on the 2000 census

Table 2

Adjusted Odds ratios (ORs) of Alcohol Use Disorders Among Adults Aged 65 Years and Older[a,b]

	Lifetime Alcohol Use Disorder OR (95% CI)					**Past 12-Month Alcohol Use Disorder OR (95% CI)**				
	All [c] N=1174	**Male [d] N=899**	**Female [e] N=275**	**Age 65–74 [f] N=792**	**Age 75+ [g] N=382**	**All [h] N=106**	**Male[i] N=84**	**Fernale [j] N=22**	**Age 65–74 [k] N=84**	**Age 75+ [l] N=22**
Lifetime tobacco use disorder	4.17 (3.30–5.26)[m]	3.82 (2.81–5.20)[m]	4.60 (3.19–6.95)[m]	3.88 (2.94–5.14)[m]	4.89 (3.04–7.88)[m]	2.52 (1.50–4.24)[m]	2.10 (1.16–3.83)[o]	4.97 (1.95–12.71)[n]	2.69 (1.51–4.78)[n]	1.50 (0.49–4.55)
Any lifetime mood disorder	1.39 (1.06–1.83)[o]	1.16 (0.81–1.67)	1.80 (1.23–2.64)[n]	1.53 (1.11–2.09)[n]	1.07 (0.52–1.84)	1.78 (1.16–2.74)[n]	1.25 (0.66–2.34)	4.28 (1.69–10.86)[n]	1.67 (1.00–2.78)	2.42 (0.85–6.86)
Any lifetime anxiety disorder	1.51 (1.16–1.97)[n]	1.68 (1.19–2.38)[n]	1.23 (0.82–1.85)	1.49 (1.08–2.06)[o]	1.57 (0.98–2.52)	1.23 (0.72–2.09)	1.27 (0.64–2.51)	1.07 (0.42–2.71)	1.36 (0.75–2.45)	0.71 (0.19–2.58)
Any personality disorder	1.39 (1.09–1.85)[o]	1.39 (1.01–1.91)[o]	1.54 (0.94–2.52)[o]	1.52 (1.04–2.23)	1.23 (0.81–1.87)	1.14 (0.60–2.17)	1.23 (0.57–2.68)	1.09 (0.32–3.71)	1.11 (0.53–2.34)	1.22 (0.28–5.27)

[a] Multiple logistic regressions controlled for age, gender, race/ethnicity, marital status, education, family income, employment status, self-rated health, and all lifetime DSM-IV disorders.

[b] The denominator *df* for the above logistic regression is 65.

Hosmer-Lemeshow χ^2 test:

[c] *df*=8, p=0.17;

[d] *df*=8, p=0.10;

[e] *df*=8, p=0.26;

[f] *df*=8, p=0.58;

[g] *df*=8, p=0.57;

[h] *df*=8, p=0.98;

[i] *df*=8, p=0.98;

[j] *df*=7, p=0.39;

[k] *df*=8, p=0.52; and

[l] *df*=8, p=0.57

Wald *t*-test:

[m] p < 0.001,

[n] p < 0.01 and

$p_o < 0.05$

Table 3

Adjusted Odds ratios (ORs) of Tobacco Use Disorders Among Adults Aged 65 Years and Older[a,b]

	Lifetime Tobacco Use Disorder OR (95% Cl)					Past 12-Month Tobacco Use Disorder				
	All [c] N=641	**Male [d] N=316**	**Female [e] N=325**	**Age 65–74 [f] N=446**	**Age 75+ [g] N=195**	**All [h] N=313**	**Male [i] N=140**	**Female [j] N=173**	**Age 65–74 [k] N=231**	**Age 75+ [l] N=82**
Lifetime alcohol use disorder	4.13 (3.28–5.21)[m]	3.82 (2.81–5.19)[m]	4.68 (3.17–6.92)[m]	3.91 (2.95–5.19)[m]	4.88 (3.06–7.78)[m]	3.50 (2.47–4.96)[m]	3.06 (1.94–4.81)[m]	4.30 (2.65–6.96)[m]	3.64 (2.43–5.44)[m]	3.30 (1.66–6.57)[m]
Any lifetime mood disorder	1.88 (1.43–2.47)[m]	2.15 (1.36–3.40)[n]	1.73 (1.25–2.39)[n]	1.66 (1.20–2.29)[n]	2.64 (1.65–4.24)[m]	1.86 (1.26–2.76)[n]	2.43 (1.23–4.81)[o]	1.55 (1.03–2.33)[o]	1.84 (1.18–2.88)[n]	1.96 (0.89–4.30)
Any lifetime anxiety disorder	1.55 (1.22–1.98)[m]	1.70 (1.13–2.55)[o]	1.53 (1.06–2.22)[o]	1.60 (1.19–2.14)[n]	1.48 (0.90–2.45)	1.09 (0.75–1.57)	0.87 (0.44–1.72)	1.37 (0.88–2.13)	1.05 (0.69–1.61)	1.23 (0.56–2.70)
Any personality disorder	1.92 (1.42–2.59)[m]	2.27 (1.51–3.41)[m]	1.58 (1.02–2.45)[o]	1.95 (1.36–2.81)[m]	1.83 (1.12–2.98)[o]	1.72 (1.14–2.58)[o]	2.34 (1.33–4.10)[n]	1.16 (0.63–2.14)	1.60 (0.96–2.65)	2.05 (0.96–4.36)

[a] Multiple logistic regressions controlled for age, gender, race/ethnicity, marital status, education, family income, employment status, self-rated health, and all lifetime DSM-IV disorders.

[b] The denominator *df* for the above logistic regression is 65.

Hosmer-Lemeshow χ^2 test:

[c] *df*=8, p=0.02;

[d] *df*=8, p=0.41;

[e] *df*=8, p=0.50;

[f] *df*=8, p=0.19;

[g] *df*=8, p=0.63;

[h] *df*=8, p<0.05;

[i] *df*=8, p=0.57;

[j] *df*=8, p=0.06;

[k] *df*=8, p=0.39, and

[l] *df*=8, p=0.48

Wald *t*-test:

[m] p < 0.001,

[n] p < 0.01 and

$p_o < 0.05$