Published in final edited form as:

Am J Geriatr Psychiatry. 2011 August ; 19(8): 685–694. doi:10.1097/JGP.0b013e3182006a96.

The Epidemiology of Alcohol Use Disorders and Subthreshold Dependence in a Middle-Aged and Elderly Community Sample

Dan G. Blazer, M.D., Ph.D. and

Duke University Medical Center Durham, NC 27710

Li-Tzy Wu, Sc.D.

Department of Psychiatry and Behavioral Sciences Duke University Medical Center Durham, NC 27710

Abstract

Objective—To estimate one-year prevalence and correlates of alcohol abuse, dependence, and subthreshold dependence (diagnostic orphans) among middle-aged and elderly persons in the United States.

Design—2005–2007 National Surveys on Drug Use and Health.

Method—Sample included 10,015 respondents 50–64 years of age and 6,289 respondents 65+ years of age. Data were analyzed by bivariate and multinomial regression analyses.

Measurements—Sociodemographic variables, alcohol use and DSM-IV abuse and dependence, major depression, nicotine dependence, illicit drug use, and nonmedical use of prescription drugs.

Results—Fifty-one percent of the sample used alcohol during the past year (56% in the 50–64 age group and 43% in the 65+ age group). Overall, 11% (dependence 1.9%, abuse 2.3%, and subthreshold dependence 7.0%) of adults aged 50–64 and about 6.7% (dependence 0.6%, abuse 0.9%, and subthreshold dependence 5.2%) of those aged 65+ reported alcohol abuse, dependence or dependence symptoms. Among past-year alcohol users, 20% (dependence 3.4%, abuse 4.0%, and subthreshold dependence 12.5%) of adults aged 50–64 and 15.4% (dependence 1.3%, abuse 2.1%, and subthreshold dependence 12.0%) of those aged 65+ endorsed alcohol abuse or dependence symptoms. “Tolerance” (48%) and “time spent using” (37%) were the two symptoms most frequently endorsed by the subthreshold group. Compared with alcohol users without alcohol abuse or dependence symptoms, Blacks or Hispanics, and those who had nicotine dependence or used nonmedical prescription drugs had increased odds of subthreshold dependence. Diagnostic orphans also were more likely to engage in binge drinking than the asymptomatic group.

Conclusions—Diagnostic orphans among middle-aged and elderly community adults show an elevated rate for binge drinking and nonmedical use of prescription drugs that require attention from health care providers.

Corresponding author: Dan G. Blazer, M.D., Ph.D., Box 3003 Duke University Medical Center, Durham, NC 27710; Tel # 919-684-4128; Fax 919-684-8569; blaze001@mc.duke.edu..

No Disclosures to Report

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

INTRODUCTION

Alcohol is the primary substance of abuse among adults aged ≥ 50 years entering treatment for substance abuse (1,2). Problematic alcohol use constitutes an elevated health risk for older adults because of age-related physiological changes that may increase sensitivity to alcohol's effects, frequent medication use that can interact adversely with alcohol, and chronic medical or psychological conditions that can be triggered or worsened by alcohol use (3,4). The American Geriatrics Society has published clinical guidelines that recommend an assessment or screening of all patients aged ≥ 65 years at least annually to identify possible alcohol use disorders (AUDs: abuse and dependence) (3). Three levels of alcohol use recommended for medical intervention are specified in these guidelines: low-risk drinking, at-risking drinking, and AUDs.

Community-based studies have focused mainly on low-risk or at-risking drinking but not on AUDs, especially for older adults. Recent trend data from the 1991–1992 National Longitudinal Alcohol Epidemiologic Survey and the 2001–2002 National Epidemiologic Survey on Alcohol and Related Conditions show that the prevalence of 12-month alcohol abuse among older adults had increased for whites (1.5% vs. 4.0% in the 45–64 group; 0.2% vs. 1.2% in the 65+ group) and blacks (0.5% vs. 2.7% in the 45–64 group; 0% vs. 0.8% in the 65+ group) (5). Results from the 2008 National Survey on Drug Use and Health (NSDUH) showed that 6% of adults aged 26+ years and 17% of adults aged 18–25 met criteria for a past-year AUD; but estimates for older age groups are not available (6).

Estimates of AUDs are necessarily categorical, following the DSM-IV approach to diagnosis (7). One problem with DSM-IV's categorical classification (7) is that individuals who endorse 1–2 alcohol dependence criteria but do not meet criteria for alcohol abuse (endorsing ≥ 1 abuse criterion) are not given a diagnosis. Alcohol users within this category of subthreshold dependence are termed “diagnostic orphans” (8,9). A limited body of research has suggested that diagnostic orphans are common compared with AUDs, and that they exhibit more psychiatric problems (e.g., depression) than those who use alcohol without AUD symptoms (9–12). Longitudinal data show that binge drinking predicts chronicity of subthreshold alcohol dependence (8). Subthreshold alcohol use among young adults also escalates into an AUD (13). However, none of these studies specifically examined subthreshold alcohol dependence among the elderly. Subthreshold alcohol use may be especially problematic for older adults because the potential for alcohol-related problems can be greater due to declining ability to metabolize alcohol and may be more likely to need treatment even if they do not meet diagnostic criteria (14).

In light of the need for empirical data on AUDs and subthreshold dependence to inform the emerging DSM-V and to facilitate screening and intervention for alcohol problems in the older population, we present the prevalence, symptom presentation, and correlates of alcohol dependence, abuse, and subthreshold dependence in a nationally representative sample of 50+ year-olds. To improve the accuracy of population estimates and enhance study findings' generalizability, the study sample is drawn from the 2005–2007 NSDUH. We compare the pattern of alcohol use by alcohol diagnostic status, including early onset of alcohol use and binge drinking due to their association with alcohol-related problems (15,14–18). We also determine whether different diagnostic groups are associated with distinct profiles in key sociodemographic characteristics, major depression, nicotine dependence, and nonmedical prescription drug use to inform the profile of diagnostic orphans compared with threshold groups.

METHODS

Sample

This study is drawn from the public-use files of the 2005–2007 NSDUH (19–21), an annual survey providing population estimates of substance use and health status of the civilian, noninstitutionalized population aged ≥ 12 years in the United States. Its sampling frame covers approximately 98% of the total U.S. population aged ≥ 12 years, and uses multistage area probability sampling methods to select a representative sample of the civilian noninstitutionalized population (household residents; residents of shelters, rooming houses, college dormitories, migratory workers' camps, and halfway houses; and civilians residing on military bases).

Respondents were interviewed privately at their places of residence. Confidentiality was stressed in all written and oral communications with potential respondents, and respondents' names were not collected. Data collection methods involved a combination of computer-assisted personal interviewing (CAPI) for demographic items and audio computer-assisted self-interviewing (ACASI) for sensitive items to increase the validity of responses (22). The ACASI provided respondents with a highly private and confidential setting in which to answer substance use and mental health questions. Questions were displayed on a computer screen and read through headphones to respondents, who entered answers directly into the computer.

From 2005–2007, approximately 5000 unique respondents 50+ years of age completed the survey yearly (weighted response rates for interviewing: 74–76%). The survey methods for 2005–2007 remained the same, and the analysis of pooled data for these years is appropriate (21).

Study Variables

Sociodemographic variables—We examined respondents' age, sex, race/ethnicity, education, current marital status, and annual family income. We also created a survey year variable to examine yearly variations in the distribution of sociodemographic variables and AUDs. Age grouping in adults was defined by NSDUH; due to confidentiality considerations, individual age was not available from the public-use files.

Alcohol use—Alcohol use was defined as consuming at least 1 drink of any type of alcoholic beverage and excluded the use of only a sip or 2 from a drink during the past year (21). A “drink” was explicitly described as a can or bottle of beer; a wine cooler or a glass of wine, champagne, or sherry; a shot of liquor; or a mixed drink containing liquor. Respondents were asked their use of alcohol in the past year. Alcohol users also reported the total number of days that they drank alcohol during the past 12 months, age of first alcohol use (onset), and the number of days on which they had ≥ 5 drinks on the same occasion during the past 30 days. “Occasion” was defined as at the same time or within a couple of hours of each other. “Binge drinking” was defined as drinking ≥ 5 drinks on the same occasion on at least 1 day within the past 30 days (21).

Alcohol use disorders (AUDs)—Past-year AUDs were specified by DSM-IV AUD criteria (7,21). According to NSDUH protocol, respondents who reported alcohol use on ≥ 6 days during the past 12 months were assessed for alcohol abuse and dependence. Criteria for alcohol dependence require the presence of ≥ 3 alcohol-specific dependence criteria (tolerance, withdrawal, taking larger amounts/longer, inability to cut down, increased time spent in alcohol use, giving up important activities, and continued use despite resulted psychological/medical problems); criteria for alcohol abuse require the presence of ≥ 1

alcohol-specific abuse criteria (role interference, problems with the law, hazardous use, and relationship problems) (7).

Subthreshold dependence (diagnostic orphans) included alcohol users who met 1–2 alcohol dependence criteria and who did not qualify for alcohol dependence or abuse (8, 23)

We created a variable to reflect 4 mutually exclusive groups of alcohol users (use alcohol on ≥ 6 days in the past year): dependence, abuse, subthreshold dependence, and use only (without endorsing any AUD criterion).

Other substance use and mental health variables—We distinguished respondents' past-year drug use by creating 2 binary variables: illicit drug use (use of marijuana/hashish, cocaine/crack, hallucinogens, or heroin) and nonmedical drug use. Nonmedical drug use was defined as any self-reported use of prescription pain relievers, sedatives, tranquilizers, or stimulants that was not prescribed for the respondent, or that the respondent took only for the experience or feeling they caused (21,24). Detailed results on nonmedical drug use among older adults aged 50 and older are reported elsewhere (24). Nicotine dependence was defined by Nicotine Dependence Syndrome Scale (NDSS) (25) and Fagerstrom Test of Nicotine Dependence (FTND) (26), and it was considered present if respondents met the NDSS or FTND criteria for dependence in the past month (21). Past-year DSM-IV major depressive episodes were assessed by questions adapted from the National Comorbidity Survey-Replication (27). Other DSM-IV mental disorders are not assessed.

Data Analysis

We examined the frequency of key demographic and alcohol use variables by survey year and found no yearly differences. In the combined sample ($N=16,304$), the prevalence of AUDs and subthreshold dependence was determined among those who reported alcohol use in the past year (≥ 6 days per NSDUH protocol). Next, χ^2 (categorical variables) and F (continuous variables) tests were used to compare alcohol use patterns (days of use, early age of first use, and binge drinking) by diagnostic category.

Among alcohol users, multinomial logistic regression procedures examined correlates of dependence, abuse, and subthreshold dependence as compared with alcohol use only (without AUD symptoms). To better understand whether dependence and abuse were distinct from subthreshold dependence, we also reported their estimated associations in correlates. To mitigate the chance of type-I errors, results from bivariate analyses of correlates by alcohol diagnostic status are used to guide the adjusted analyses. Only variables with p -values ≤ 0.05 are included in the adjusted logistic regression model to determine their associations with alcohol diagnostic status while controlling for their potentially confounding influences on odds ratio estimates. Analyses were conducted with SUDAAN to take into account NSDUH's complex survey features (e.g., weighting and clustering) (28). All estimates presented here are weighted except for sample sizes (unweighted).

RESULTS

Prevalence of AUDs among All Adult Respondents (Table 1)

Of all adults aged ≥ 50 years ($N=16,304$), 9.3% reported some DSM-IV AUD symptoms in the past year (dependence, 1.4 %; abuse, 1.7%; subthreshold dependence, 6.3%). Adults aged 50–64 years had a higher prevalence of AUDs than those aged ≥ 65 years (4.2% vs. 1.5%), and men had a higher prevalence than women (5.0% vs. 1.4%). Additionally,

subthreshold dependence was found in 8.4% of men, 4.4% of women, 7.0% the 50–64 age group, and 5.2% of the 65+ age group.

Prevalence of AUDs among Alcohol Users (Table 2)

Among past-year alcohol users (N=8190, 51% of all respondents), 6.1% met criteria for an AUD (dependence, 2.7%; abuse, 3.4%), and another 12.4 % had subthreshold dependence. The prevalence of AUDs among alcohol users was associated with all sociodemographic variables examined, major depression, nicotine dependence, illicit drug use, and nonmedical drug use. Alcohol users who had major depression (12.6%) or who also used illicit (22.9%) or nonmedical (12.7%) drugs in the past year had a particularly high rate of alcohol dependence. Alcohol-using illicit (8.0%, 17.7%, respectively) or nonmedical (6.5%, 23.3%, respectively) drug users also had elevated rates of alcohol abuse and subthreshold dependence. Additionally, alcohol users who were Hispanic (17.4%) or had not completed high school (18.4%) had a high rate of subthreshold dependence.

Patterns of Alcohol Use by AUD Status (Table 3)

The dependence group on average reported 5.1 AUD criteria as compared with 1.9 criteria in the abuse group. Both groups were similar in the total number of days using alcohol (215 days/year, dependence; 204 days/year, abuse), and the majority initiated alcohol use in adolescence and reported binge drinking in the past month (70% in the dependence group; 62% in the abuse group). Compared with alcohol users without AUD symptoms, the subthreshold group reported more binge drinking (48% vs. 18%) and early onset of alcohol use (55% vs. 46%), and a greater number of days using alcohol (171 days/year vs. 107 days/year).

Patterns of AUD Symptoms (Figure 1)

The abuse group was most likely to endorse *hazardous use* (73% in the abuse group). The dependence group reported a higher prevalence of all dependence criteria and was more likely to endorse *role interference* than the abuse group. Physical dependence symptoms also were common in the dependence group (*tolerance*, 70%; *withdrawal*, 31%). *Tolerance* (48%) and *time spent* (37%) were the most frequent symptoms among subthreshold users.

Adjusted Odds Ratios of AUDs among Alcohol Users (Table 4)

Relative to alcohol use only, ages 50–64, male gender, black race, low family income (< \$40,000), major depression, nicotine dependence, illicit drug use, nonmedical drug use, and early onset of alcohol use (<18 years) increased the odds of dependence. Ages 50–64, male gender, being separated/divorced/widowed, nicotine dependence, nonmedical drug use, and early onset of alcohol use increased the odds of abuse; while male gender, black or Hispanic race, low family income, nicotine dependence, nonmedical drug use, and early onset of alcohol use increased the odds of subthreshold dependence.

AUD vs. subthreshold dependence—Compared with subthreshold dependence, ages 50–64, male gender, major depression, nicotine dependence, and early onset of alcohol use increased the odds of dependence; and ages 50–64, male gender, white race (relative to black race), and being separated/divorced/widowed increased the odds of abuse.

DISCUSSION

Overall, 59% of male respondents and 44% of female respondents reported alcohol use during the past year. Approximately 6% of past-year alcohol users aged ≥ 50 years had an AUD, and AUDs were more frequent in respondents ages 50–64 and among men.

Symptoms of *tolerance* (requiring more alcohol to get “high”) and *time spent* (a lot of time spent in activities necessary to use or recover from alcohol’s effects) were the most frequent AUD symptoms. This national study also identified several subsets of alcohol users who had greater odds of exhibiting alcohol dependence, including adults who had a lower income, major depression or nicotine dependence, or who used illicit or nonmedical drugs in the past year.

While major depression and nicotine dependence were more likely to be associated with alcohol dependence compared with subthreshold dependence, there were no significant differences in major depression, nicotine dependence, and use of illicit or nonmedical drugs between the subthreshold and abuse groups. These diagnostic orphans were much more likely to report binge drinking during the past 30 days and to drink more days during the preceding year. Thus, “diagnostic orphans” of alcohol users among middle-aged and elderly adults have significant health risks compared with those who use alcohol without AUD symptoms. Binge drinking is associated with many health problems or consequences, including falls and automobile accidents (15-18,29). Given that physicians and other health care professionals are often reticent to ask older adults about their use of alcohol, at-risk subthreshold alcohol use may go undetected. The problem may be even more an issue for females as the cut off of ≥ 5 may be unduly conservative. We as yet do not know how the developers of DSM-V will manage subthreshold symptoms across a number of domain yet these data should be of value in assisting that management.

These findings should be interpreted with some caution (21,29). First, the cross-sectional nature of the data precludes drawing causal inference related to the associations we have reported. Second, substance use behaviors are obtained from respondents’ self-reports, which are subject to biases associated with memory errors and under-reporting (30). In addition, individuals who were institutionalized (in jails or long-term hospitals) or homeless on the date of the survey are not included in NSDUH; and these groups often have higher rates of alcohol problems than the general population. Finally, individuals who suffer from severe health or psychiatric problems from substance abuse are unlikely to participate in a household survey. In addition, as age increases so does the risk for cognitive impairment and dementia. This might affect self-report data in several ways; for example, by excluding cognitively impaired people who anecdotally tend to drink less hence producing overestimates, or by providing inaccurate recalled responses.

Despite these limitations, the NSDUH design has noteworthy strengths. The large number of respondents provides one of the largest samples of alcohol users aged ≥ 50 years living in the community. NSDUH has a high response rate, and the probes assessing substance use are quite detailed. In addition, the survey used advanced ACASI technology to assess respondents’ substance use behaviors, provided incentive payments of \$30 to each respondent, implemented data collection quality control procedures, and improved sample weight calibration by using the 2000 decennial census. These design features have improved the quality of the data and increased respondents’ responses (21,31).

Little is presently known about whether older adults with subthreshold dependence had AUDs in the past or whether they will abuse alcohol or become dependent in the future. Nevertheless, subthreshold alcohol dependence is prevalent among middle-aged and elderly adults nationally and the potential adverse consequences of subthreshold dependence are important as they age and are, hence, more susceptible to health problems, which may often be overlooked by clinicians. Therefore, screening of middle-aged and older adults for alcohol problems should include questions about dependence symptoms. Finally, these national findings suggest the need to screen for binge drinking, nicotine dependence, and nonmedical prescription drug use among adults with subthreshold alcohol use.

Acknowledgments

The Substance Abuse and Mental Health Data Archive provided the public use data files for the National Survey on Drug Use and Health, which was sponsored by the Office of Applied Studies of Substance Abuse and Mental Health Services Administration. We thank Amanda McMillan for her editorial assistance.

FUNDING This work was supported by research grants from the U.S. National Institute on Drug Abuse of the National Institutes of Health (R01DA019623, R01DA019901, R21DA027503 to Li-Tzy Wu), a contract for the Data and Statistics Center for the Clinical Trials Network of the National Institute on Drug Abuse (HSN271200522071C to Dan G. Blazer), and the Department of Psychiatry and Behavioral Sciences of Duke University Medical Center. The opinions expressed in this paper are solely those of the authors, not of any sponsoring agency.

REFERENCES

1. Substance Abuse and Mental Health Services Administration. Office of Applied Studies. The NSDUH Report: Substance Use Among Older Adults, 2002 & 2003 Update. Substance Abuse and Mental Health Services Administration, Office of Applied Studies; Rockville, MD: 2005.
2. Substance Abuse and Mental Health Services Administration. Office of Applied Studies. The DASIS Report: Older Adults in Substance Abuse Treatment, 2005. Substance Abuse and Mental Health Services Administration, Office of Applied Studies; Rockville, MD: 2007.
3. American Geriatrics Society. [Updated in 2003. Accessed on February 1, 2010] Clinical guidelines for alcohol use disorders in older adults. <http://www.americangeriatrics.org/products/positionpapers/alcohol.shtml>
4. Gossop M, Moos R. Substance misuse among older adults: a neglected but treatable problem. *Addiction*. 2008; 103:347–348. [PubMed: 18205895]
5. Grant BF, Dawson DA, Stinson FS, Chou SP, Dufour MC, Pickering RP. The 12-month prevalence and trends in DSM-IV alcohol abuse and dependence: United States, 1991-1992 and 2001-2002. *Drug Alcohol Depend*. 2004; 74:223–234. [PubMed: 15194200]
6. Substance Abuse and Mental Health Services Administration. Results from the 2008 National Survey on Drug Use and Health: National Findings Detailed Tables. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: <http://www.oas.samhsa.gov/NSDUH/2K8NSDUH/tabs/Sect5peTabs1to56.htm#Tab5.2B>
7. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed. American Psychiatric Association; Washington, DC: 2000. Text revision
8. Hasin D, Paykin A. Dependence symptoms but no diagnosis: diagnostic ‘orphans’ in a community sample. *Drug Alcohol Depend*. 1998; 50:19–26. [PubMed: 9589269]
9. Ray LA, Miranda R Jr, Chelminski I, Young D, Zimmerman M. Diagnostic orphans for alcohol use disorders in a treatment-seeking psychiatric sample. *Drug Alcohol Depend*. 2008; 96(1-2):187–191. [PubMed: 18430524]
10. Eng MY, Schuckit MA, Smith TL. A five-year prospective study of diagnostic orphans for alcohol use disorders. *J Stud Alcohol*. 2003; 64:227–234. [PubMed: 12713196]
11. Sarr M, Bucholz KK, Phelps DL. Using cluster analysis of alcohol use disorders to investigate ‘diagnostic orphans’: subjects with alcohol dependence symptoms but no diagnosis. *Drug Alcohol Depend*. 2000; 60:295–302. [PubMed: 11053764]
12. McBride O, Adamson G, Bunting B, McCann S. Diagnostic orphans: comparing self-report lifetime course to groups with DSM-IV alcohol abuse and dependence. *Addict Behav*. 2009; 34:86–91. [PubMed: 18778897]
13. Shankman SA, Lewinsohn PM, Klein DN, Small JW, Seeley JR, Altman SE. Subthreshold conditions as precursors for full syndrome disorders: a 15-year longitudinal study of multiple diagnostic classes. *J Child Psychol Psychiatry*. 2009; 50:1485–1494. [PubMed: 19573034]
14. Satre DD, Mertens J, Areán PA, Weisner C. Contrasting outcomes of older versus middle-aged and younger adult chemical dependency patients in a managed care program. *J Stud Alcohol*. 2003; 64:520–530. [PubMed: 12921194]

15. Center for Disease Control and Prevention. Quick Stats Binge Drinking. Division of Adult and Community Health, National Center for Chronic Disease and Health Promotion; Atlanta, GA: 2008.
16. Grant BF, Dawson DA. Age at onset of alcohol use and its association with DSM-IV alcohol abuse and dependence: results from the National Longitudinal Alcohol Epidemiologic Survey. *J Subst Abuse*. 1997; 9:103–110. [PubMed: 9494942]
17. Moore A, Endo J, Carter M. Is there a relationship between excessive drinking and functional impairment in older persons? *J Am Geriatr Soc*. 2003; 51:44–49. [PubMed: 12534844]
18. Rundberg J, Lidfeldt J, Nerbrand C, Samsioe G, Romelsjö A, Ojehagen A. Abstinence, occasional drinking and binge drinking in middle-aged women. The Women's Health in Lund Area (WHILA) Study. *Nord J Psychiatry*. 2008; 62:186–191. [PubMed: 18609026]
19. Substance Abuse and Mental Health Services Administration. Results from the 2005 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: 2006.
20. Substance Abuse and Mental Health Services Administration. Results from the 2006 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: 2007.
21. Substance Abuse and Mental Health Services Administration. Results from the 2007 National Survey on Drug Use and Health: National Findings. Office of Applied Studies, Substance Abuse and Mental Health Services; Rockville, MD: 2008.
22. Turner CF, Ku L, Rogers SM, Lindberg LD, Pleck JH, Sonenstein F. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science*. 1998; 280:867–873. [PubMed: 9572724]
23. Hasin D, Paykin A. Dependence symptoms but no diagnosis: diagnostic 'orphans' in a 1992 national sample. *Drug Alcohol Depend*. 1999; 53:215–222. [PubMed: 10080047]
24. Blazer DG, Wu LT. Nonprescription use of prescription pain relievers among middle aged and elderly community adults: National Survey on Drug Use and Health. *J Am Geriatr Soc*. 2009; 57:1252–1257. [PubMed: 19486199]
25. Shiffman S, Waters AJ, Hickcox M. The Nicotine Dependence Syndrome Scale: a multidimensional measure of nicotine dependence. *Nicotine Tob Res*. 2004; 6:327–348. [PubMed: 15203807]
26. Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom KO. The Fagerstrom Test for Nicotine Dependence: a revision of the Fagerstrom Tolerance Questionnaire. *Br J Addict*. 1991; 86:1119–1127. [PubMed: 1932883]
27. Kessler RC, Merikangas KR. The National Comorbidity Survey Replication (NCS-R): background and aims. *Int J Methods Psychiatr Res*. 2004; 13:60–68. [PubMed: 15297904]
28. Research Triangle Institute. SUDAAN User's Manual, Release 9.0. Research Triangle Institute; Research Triangle Park, NC: 2006.
29. Blazer DG, Wu LT. The epidemiology of at-risk and binge drinking among middle-aged and elderly community adults: National Survey on Drug Use and Health. *Am J Psychiatry*. 2009; 166:1162–1169. [PubMed: 19687131]
30. Gfroerer JC, Lesser J, Parsley T. Studies of non-response and measurement error in the national household survey on drug abuse. *NIDA Res Monogr*. 1997; 167:273–295. [PubMed: 9243566]
31. Substance Abuse and Mental Health Services Administration. National Survey on Drug Use and Health: Summary of Methodological Studies, 1971–2005. Office of Applied Studies, Substance Abuse and Mental Health Services Administration; Rockville, MD: 2006.

Figure 1. Twelve-month prevalence (percentage) of DSM-IV alcohol abuse and dependence symptoms among past-year alcohol users aged 50 years and older (2005–2007 National Surveys on Drug Use and Health): Lines extended from bars indicate 95% confidence intervals of the estimates.

12-month prevalence of alcohol use disorders and subthreshold dependence among adult respondents aged 50 years and older: 2005–2007 National Surveys on Drug Use and Health (N=16,304)

Table 1

Prevalence, % (SE)	Sample size	Alcohol dependence	Alcohol abuse	Subthreshold alcohol dependence	Alcohol use without abuse or dependence symptoms	No alcohol use	χ^2 (df)	p-value
Overall	16304	1.4 (0.12)	1.7 (0.12)	6.3 (0.26)	41.3 (0.47)	49.4 (0.46)		
Age in years								
50–64	10015	1.9 (0.18)	2.3 (0.19)	7.0 (0.36)	44.7 (0.58)	44.1 (0.60)	228.5 (4)	
≥ 65	6289	0.6 (0.12)	0.9 (0.16)	5.2 (0.36)	36.4 (0.77)	57.0 (0.73)	<0.001	
Sex								
Male	7376	2.1 (0.21)	2.9 (0.23)	8.4 (0.45)	45.0 (0.75)	41.0 (0.76)	302.5 (4)	
Female	8928	0.7 (0.70)	0.7 (0.10)	4.4 (0.26)	38.2 (0.61)	56.0 (0.62)	<0.001	
Race/ethnicity								
White	12781	1.3 (0.14)	1.8 (0.13)	6.2 (0.28)	45.2 (0.47)	45.6 (0.52)	219.0 (12)	
Black	1480	2.1 (0.51)	0.9 (0.24)	7.1 (0.85)	26.2 (1.62)	63.8 (1.68)	<0.001	
Hispanic	1158	1.7 (0.43)	1.8 (0.60)	7.1 (1.10)	30.5 (1.68)	58.9 (1.94)		
Other	885	1.1 (0.36)	1.4 (0.56)	5.0 (1.04)	27.0 (24.3)	65.5 (2.74)		
Education								
>High school	2981	1.4 (0.30)	1.2 (0.20)	5.5 (0.66)	21.9 (0.94)	70.1 (1.04)	710.4 (8)	
High school	5511	1.3 (0.20)	1.4 (0.21)	5.8 (0.39)	36.5 (0.77)	55.0 (0.82)	<0.001	
≥ College	7812	1.4 (0.13)	2.1 (0.21)	6.8 (0.38)	51.6 (0.67)	38.1 (0.63)		
Survey year								
2005	5123	1.2 (0.17)	1.7 (0.20)	6.1 (0.43)	41.7 (0.82)	49.3 (0.90)	4.4 (8)	
2006	5830	1.4 (0.20)	1.6 (0.22)	6.0 (0.38)	41.0 (0.89)	50.0 (0.90)	0.810	
2007	5351	1.4 (0.21)	1.7 (0.20)	6.7 (0.43)	41.2 (0.84)	48.9 (0.87)		

Past-year alcohol use referred as alcohol use on 6 or more days in the past year.

Sample sizes are unweighted numbers; proportions are weighted figures.

SE: standard error.

12-month prevalence of alcohol use disorders and subthreshold dependence among past-year alcohol users: 2005–2007 National Surveys on Drug Use and Health (N=8,190)

Table 2

Prevalence, % (SE)	Sample size	Alcohol dependence	Alcohol abuse	Subthreshold dependence	Alcohol use only ^a	χ^2 (df) p-value
Overall	8190	2.7 (0.24)	3.4 (0.24)	12.4 (0.50)	81.6 (0.57)	
Age in years						
50–64	5548	3.4 (0.32)	4.0 (0.33)	12.5 (0.62)	80.1 (0.67)	38.4 (3)
≥65	3478	1.3 (0.28)	2.1 (0.37)	12.1 (0.82)	84.5 (1.06)	<0.001
Sex						
Male	4271	3.6 (0.35)	5.0 (0.39)	14.4 (0.74)	77.0 (0.88)	139.8 (3)
Female	3919	1.6 (0.23)	1.5 (0.23)	10.5 (0.59)	86.9 (0.61)	<0.001
Race/ethnicity						
White	6838	2.3 (0.26)	3.4 (0.25)	11.3 (0.49)	83.1 (0.53)	35.9 (9)
Black	561	5.8 (1.38)	4.9 (0.68)	10.9 (2.26)	72.3 (2.54)	<0.001
Hispanic	469	4.1 (1.01)	4.5 (1.38)	17.4 (2.50)	74.2 (2.95)	
Other	322	3.2 (1.09)	4.0 (1.43)	14.5 (2.95)	78.4 (33.0)	
Education						
>High school	881	4.7 (0.95)	3.9 (0.68)	18.4 (2.08)	73.0 (2.41)	23.8 (6)
High school	2545	3.0 (0.45)	3.1 (0.45)	12.9 (0.84)	81.1 (0.97)	0.002
≥College	4764	2.2 (0.21)	3.4 (0.34)	11.1 (0.61)	83.4 (0.71)	
Marital status						
Married	5429	2.0 (0.23)	3.1 (0.27)	11.9 (0.52)	83.1 (0.69)	29.6 (6)
Sep/div/widowed	2260	3.9 (0.52)	4.2 (0.59)	13.0 (0.90)	78.9 (0.52)	<0.001
Never married	501	5.3 (1.09)	3.6 (0.74)	14.7 (1.97)	76.5 (2.47)	
Family income						
<\$40K	2794	2.7 (0.24)	3.7 (0.45)	15.1 (0.89)	81.6 (0.57)	54.6 (6)
\$40K–\$74,999	2631	4.4 (0.58)	2.7 (0.41)	11.5 (0.90)	78.8 (1.07)	<0.001
≥\$75K	2765	1.7 (0.27)	3.6 (0.39)	10.4 (0.75)	84.4 (0.82)	

Prevalence, % (SE)	Sample size	Alcohol dependence	Alcohol abuse	Subthreshold dependence	Alcohol use only*	χ^2 (df) p-value
Major depression						
Yes	403	12.6 (2.32)	4.1 (1.25)	12.8 (2.12)	70.6 (2.77)	23.3 (3)
No	7787	2.2 (0.22)	3.3 (0.26)	12.3 (0.53)	82.2 (0.59)	<0.001
Nicotine dependence						
Yes	1122	8.1 (1.23)	5.7 (0.88)	15.9 (1.28)	70.3 (1.60)	55.3 (3)
No	7068	1.9 (0.21)	3.0 (0.25)	11.9 (0.55)	83.2 (0.63)	<0.001
Illicit drug use						
Yes	386	22.9 (2.54)	8.0 (1.71)	17.7 (2.57)	61.3 (3.76)	26.8 (3)
No	7804	2.2 (0.22)	3.1 (0.25)	12.1 (0.50)	82.6 (0.58)	<0.001
Nonmedical drug use						
Yes	206	12.7 (2.69)	6.5 (1.80)	23.2 (3.90)	57.6 (4.16)	28.3 (3)
No	7984	2.4 (0.23)	3.3 (0.24)	12.1 (0.49)	82.2 (0.59)	<0.001
Survey year						
2005	2559	2.4 (0.32)	3.4 (0.37)	12.0 (0.80)	82.2 (0.96)	3.7 (6)
2006	2943	2.8 (0.38)	3.3 (0.44)	11.9 (0.74)	82.0 (1.03)	0.719
2007	2688	2.9 (0.40)	3.4 (0.39)	13.1 (0.83)	80.6 (0.92)	

* Including alcohol users who had no DSM-IV alcohol abuse and dependence symptoms in the past year.

Sample sizes are unweighted numbers; proportions are weighted figures.

SE: standard error.

Pattern of alcohol use by diagnostic category among past-year alcohol users aged 50 years and older: 2005–2007 National Surveys on Drug Use and Health (N=8,190)

Table 3

Estimate (95% confidence interval)	Alcohol dependence	Alcohol abuse	Subthreshold alcohol dependence	Alcohol use without abuse or dependence symptoms	Bivariate test
Sample size, N	255	273	1004	6658	
Number of alcohol abuse or dependence criteria met, mean	5.1 (4.84–5.42)	1.9 (1.72–2.04)	1.2 (1.18–1.25)	0	Wald F=357.4 (2) p<0.001
Number of days of using alcohol in past year, mean	215.2 (196.92–233.46)	203.6 (179.41–227.71)	170.8 (159.66–182.00)	106.7 (102.54–110.84)	Wald F=83.5 (3) p<0.001
Onset of first alcohol use before age 18 years, %	73.4 (66.17–79.85)	69.0 (62.64–74.77)	55.0 (51.37–58.51)	45.8 (44.01–47.67)	$\chi^2=259.3$ (3) p<0.001
Binge drinking in the past 30 days, %	70.3 (62.58–76.90)	61.6 (53.38–69.12)	48.2 (44.04–52.30)	17.9 (16.79–19.08)	$\chi^2=86.7$ (3) p<0.001

There are significant differences in the estimate between groups in a same row when their 95% confidence intervals do not overlap.

Multinomial logistic regression analyses of alcohol use disorders among past-year alcohol users aged 50 years and older: 2005–2007 National Surveys on Drug Use and Health (N=8,190)

Table 4

Adjusted odds ratios (95% confidence intervals)*	Dependence vs. alcohol use only	Abuse vs. alcohol use only	Subthreshold dependence vs. alcohol use only	Dependence vs. subthreshold dependence	Abuse vs. subthreshold dependence
Age in years (vs. 65+)					
50–64	1.9 (1.11–3.22) [‡]	1.8 (1.14–2.79) [‡]	1.0 (0.84–1.123)	1.8 (1.04–3.16) [‡]	1.7 (1.11–2.63) [‡]
Sex (vs. female)					
Male	2.4 (1.69–3.41) [‡]	3.5 (2.42–5.10) [‡]	1.5 (1.26–1.78) [‡]	1.6 (1.07–2.39) [‡]	2.3 (1.60–3.37) [‡]
Race/ethnicity (vs. white)					
Black	2.0 (1.08–3.55) [‡]	0.6 (0.35–1.16)	1.7 (1.28–2.31) [‡]	1.1 (0.59–2.19)	0.40 (0.20–0.69) [‡]
Hispanic	1.5 (0.80–2.95)	1.4 (0.70–2.85)	1.5 (1.05–2.23) [‡]	1.0 (0.51–1.99)	0.92 (0.44–1.95)
Other	1.6 (0.66–3.75)	1.3 (0.60–2.64)	1.4 (0.86–2.28)	1.1 (0.48–2.62)	0.90 (0.38–2.15)
Education (vs. ≥ college)					
<High school	1.2 (0.73–1.97)	1.0 (0.61–1.58)	1.3 (0.90–1.85)	0.9 (0.57–1.52)	0.8 (0.44–1.30)
High school graduate	1.5 (0.83–1.59)	0.9 (0.62–1.36)	1.1 (0.88–1.33)	1.1 (0.74–1.51)	0.8 (0.56–1.28)
Marital status (vs. married)					
Separated/divorced/widowed	1.4 (0.95–2.06)	1.6 (1.05–2.52) [‡]	1.0 (0.87–1.23)	1.4 (0.92–1.98)	1.6 (1.02–2.40) [‡]
Never married	1.1 (0.66–1.89)	1.0 (0.58–1.63)	1.0 (0.70–1.46)	1.0 (0.54–1.87)	0.7 (0.48–1.13)
Family income (vs. \$75K+)					
<\$40K	2.3 (1.33–1.80) [‡]	1.3 (0.87–1.93)	1.5 (1.11–1.91) [‡]	1.5 (0.90–2.64)	0.9 (0.57–1.37)
\$40K–\$74,999	1.2 (0.64–2.09)	0.8 (0.57–1.24)	1.1 (0.86–1.52)	1.0 (0.52–1.80)	0.7 (0.50–1.13)
Major depression (vs. no)					
Yes	4.5 (2.74–7.51) [‡]	1.2 (0.57–2.60)	1.1 (0.73–1.71)	4.0 (2.17–7.53) [‡]	1.1 (0.46–2.59)
Nicotine dependence (vs. no)					
Yes	2.4 (1.56–3.64) [‡]	1.6 (1.07–2.40) [‡]	1.3 (1.02–1.64) [‡]	1.8 (1.15–2.93) [‡]	1.2 (0.82–1.88)

Adjusted odds ratios (95% confidence intervals)*	Dependence vs. alcohol use only	Abuse vs. alcohol use only	Subthreshold dependence vs. alcohol use only	Dependence vs. subthreshold dependence	Abuse vs. subthreshold dependence
Illicit drug use (vs. no)					
Yes	2.4 (1.25–4.77) [‡]	1.7 (0.95–3.14)	1.3 (0.88–1.91)	1.9 (0.94–3.74)	1.3 (0.69–2.55)
Nonmedical drug use (vs. no)					
Yes	3.6 (1.90–6.88) [‡]	2.0 (1.06–3.70) [‡]	2.4 (1.51–3.73) [‡]	1.5 (0.75–3.07)	0.8 (0.39–1.75)
Age of first alcohol use (vs. 18+)					
<18 years	2.3 (1.48–3.59) [‡]	1.9 (1.36–2.57) [‡]	1.4 (1.13–1.61) [‡]	1.7 (1.06–2.71) [‡]	1.4 (0.97–1.96)

* The model included all variables listed in the first column; p-values are based on Wald tests; degree of freedom (df) is 9 for race/ethnicity; df is 6 for educational level, marital status, and family income; df is 3 for the remaining variables in the first column.

[‡] $p < 0.05$.

[‡] $p \leq 0.01$.