Alcohol Consumption Among Older Adults in Primary Care

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BACKGROUND: Alcohol misuse is a growing public health concern for older adults, particularly among primary care patients.

OBJECTIVES: To determine alcohol consumption patterns and the characteristics associated with at-risk drinking in a large sample of elderly primary care patients.

DESIGN: Cross-sectional analysis of multisite screening data from 6 VA Medical Centers, 2 hospital-based health care networks, and 3 Community Health Centers.

PARTICIPANTS: Patients, 43,606, aged 65 to 103 years, with scheduled primary care appointments were approached for screening; 27,714 (63.6%) consented to be screened. The final sample of persons with completed screens comprised 24,863 patients.

MEASUREMENTS: Quantity and frequency of alcohol use, demographics, social support measures, and measures of depression/anxiety.

RESULTS: Of the 24,863 older adults screened, 70.0% reported no consumption of alcohol in the past year, 21.5% were moderate drinkers (1–7 drinks/week), 4.1% were at-risk drinkers (8–14 drinks/week), and 4.5% were heavy (>14 drinks/week) or binge drinkers. Heavy drinking showed significant positive association with depressive/anxiety symptoms [Odds ratio (OR) (95% CI): 1.79 (1.30, 2.45)] and less social support [OR (95% CI): 2.01 (1.14, 2.56)]. Heavy drinking combined with binging was similarly positively associated with depressive/anxiety symptoms [OR (95%): 1.70 (1.33, 2.17)] and perceived poor health [OR (95% CI): 1.27 (1.03, 1.57)], while at-risk drinking was not associated with any of these variables.

CONCLUSIONS: The majority of participants were nondrinkers; among alcohol users, at-risk drinkers did not differ significantly from moderate drinkers in their characteristics or for the 3 health parameters evaluated. In contrast, heavy drinking was associated with depression and anxiety and less social support, and heavy drinking combined with binge drinking was associated with depressive/anxiety symptoms and perceived poor health.

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Persons older than age 64 comprise the fastest growing segment of the U.S. population (U.S. Census Bureau). By 2040, the number of older adults will increase to more than 20% of our total population (U.S. Census Bureau), increasing demands on health services. Although alcohol use generally declines with age,[1,2] the increased proportion of older adults may require expanded, specialized health care services for elderly persons with at-risk drinking behavior.

Detecting and addressing problem drinking in older adults is as important as in younger persons. Older adults often have compromised physical health and functioning, and many take prescription medications. Among the elderly, problem drinking is more highly correlated with functional impairment than smoking, age, use of sedatives or tranquilizers, stroke, or grip strength[3] and has potential adverse interactions with prescription drugs.[4,5] Specific types or patterns of alcohol consumption, including both alcohol dependence and "binge" drinking, pose a special risk for the elderly.[4,6–8]

Little is known about elderly drinking habits within primary care populations and their association with sociodemographic factors or social and health status. This study describes the alcohol consumption of older adults (n=24,863) screened through Primary Care Research in Substance Abuse and Mental Health for Elderly (PRISM-E), a study in 36 primary care clinics across the United States.[9] Although not a nationally representative sample, the sample is the largest and the most geographically and ethnically diverse and includes the largest sample of primary care elders age 75 and older to-date.

The objectives of this study were to: (1) describe alcohol use patterns among older primary care patients and (2) identify health parameters associated with consumption levels. The findings provide a valuable resource for primary care physicians in the detection and treatment of alcohol abuse in older adults and can inform policy makers when identifying alcohol use standards.

METHODS

The PRISM-E study was a randomized, multisite investigation comparing the effectiveness of integrated and referral systems for treatment of behavioral health in the elderly.[9] Eleven sites participated: 6 outpatient VA medical centers; 3 community health centers; and 2 hospital based networks. Although the sites were diverse, primary care practices/clinics within each site were homogeneous in patient demographics, geographic location, staffing, and implementation of the PRISM-E protocol. Thus, site is the organizational-level variable used in these analyses. Study enrollment occurred over an 18-month period from April 2000 through September 2001. All patients age 65 and older who had a primary care appointment during the enrollment period were eligible for screening. At all 36 clinics, patients who consented to participation were screened to identify their level of alcohol consumption and depressive and anxiety symptoms, which determined eligibility for baseline diagnostic assessment. Data generated from the screening process are used in these analyses. Institutional Review Board (IRB) approval was obtained at each site.

Of the 43,606 older persons approached, 27,714 (63.6%) consented to be screened. Of consenting patients: 2.5% (n=706) were excluded because of severe cognitive impairment (16 or higher on the Brief Orientation Memory Concentration Test)[10]; 5.5% had incomplete alcohol data (n=1,513); 2.3% were less than 65 (n=632); and 9 were unable or unwilling to complete the screen, resulting in a final screening sample of 24,863.

A standardized screen was used for all patients. Four screening modalities were used: self-report[11,12] both mail-out (1 site) and in-clinic (1 site); telephone interview (4 sites); and in-person interview, in-clinic (5 sites). Using multiple screening modalities yielded a broader representation of geographic and clinical settings and patient populations. Previous studies indicate that there are few or no differences in reported alcohol use between personal interviews and mail[11] or telephone[12] interviews.

Screening Instruments

Alcohol Consumption. Patients were asked whether they had consumed "a drink of alcohol in the past year." Those who responded "yes" were asked to report, for the previous 3 months, the average number of days per week they consumed alcohol, and on the days they drank, the average number of drinks per day. Average drinks per week were then calculated. Moderate drinking was defined as 1–7 drinks/week, at-risk drinking as 8–14 drinks/week, and heavy drinking as more than 14 drinks/week. Patients were asked to report the number of times that they consumed 4 or more drinks in 1 day (binge drinking) over the past 3 months. Respondents who reported 4 or more episodes of binge drinking in 3 months were defined as binge drinkers. To make the categories mutually exclusive, persons with ≥4 binges in 3 months were classified as bingers, regardless of their previous week's consumption level. Persons classified as moderate, at-risk, or heavy drinkers could have had 0–3 binge episodes in the 3-month period but not be classified as binge drinkers.

Demographics, Social Support, Depressive/Anxiety Symptoms, and General Health Status. Data were collected on age, race/ethnicity, gender, marital status, living arrangement, and social support. Depressive/Anxiety symptoms were measured using the General Health Questionnaire (GHQ), a 12-item scale predictive of clinical depression or anxiety in samples of diverse ethnic/racial/age groups,[13,14] additional detail on GHQ scoring for PRISM-E is found in Levkoff SE, et al.[9] Perception of social support was measured by self-ratings on whether respondents "felt loved and cared for" using a Likert scale ranging from "not at all" to "a great deal." Perception of general health was adapted from the SF-36 using a 5-point scale ranging from excellent to poor; this single item has demonstrated the most explanatory power for general health.[15,18] Dichotomous data also were collected on current tobacco use.

Statistical Methods

The Chi-square test was used to test for equality of demographic characteristics across drinking pattern categories. Bivariate cross-tabulations and multiple logistic regression analyses were used to study associations between drinking pattern and depression/anxiety symptoms; perception of general health; and perception of social support. In bivariate analyses, t-tests were used to compare non-, at-risk, heavy, and binge drinkers to moderate drinkers. All race/ethnicities are included in the bivariate analyses, whereas the logistic regression analyses were restricted to white and African-American respondents. Other race/ethnic groups had very low drinking rates and were not represented in adequate numbers for reliable regression analysis. In addition, 1 site contributed over 90% of Chinese Americans and another 75% of Hispanic Americans; confounded by site, these ethnic groups were inappropriate for multivariate analysis.

The logistic regression models controlled for age, gender, race (African American and white), living arrangement, smoking, and site. After controlling for age, gender, race/ethnicity, current smoking, and general health status, participants who were screened in-person were slightly more likely to report abstaining from alcohol in the past year than those screened by telephone (Odds ratio (OR)=1.15, 95% CI, 1.00 to 1.30). Among drinkers, the average reported drinks/week (3.1 drinks/week) and binge episodes (2.1 binges/3 months) were somewhat higher among those screened in-person than by telephone. Given the likely presence of residual confounding (unmeasured education and income), attribution of these differences to screening methodology, is difficult. However, all analyses controlled for site because of these variations. We also tested models controlling for VA/non-VA status rather than individual sites. Site models explained more of the variation in the log-odds of each health parameters than VA/non-VA status. Thus, controlling for individual site rather than the more general VA/non-VA variable resulted in better final models. All analyses used SAS version 8.0.

RESULTS

A total of 24,863 people age 65 years and older completed screening; 56% were between 65 and 75 years and 44% were 75 years or older. The median age was 72 years and the range was 65 to 103 years. Eighty-one percent were male, reflecting the substantial participation from VA Centers. Seventy-two percent identified themselves as white, 16.1% African American, 4.9% Chinese American, 5.4% Hispanic/Latino American, and 1.4% Native American, mixed or "other." Nineteen percent had symptoms of depression/anxiety, about 5% reported that they did not feel loved and cared for, and 25.6% lived alone. Of the sample, 42% reported fair or poor health; and 10.7% were currently smoking.

Seventy percent of the sample did not consume alcohol, 21.5% were moderate drinkers (1–7 drinks per week), 4.1% were at-risk drinkers (8–14 drinks per week), and 4.5% were heavy drinkers or bingers. Applying the National Institute on Alcohol Abuse and Alcoholism (NIAAA) guideline for persons over the age of 65 (no more than 1 drink a day equivalent to a cutoff of 7 drinks per week), resulted in 9.2% of the men and 2.1% of the women, or 7.9% overall, drinking in excess of the guideline.[16]

As shown in Table 1, the proportion of elders reporting drinking declined with age. However, more than 20% of adults, 85 or older, reported consuming at least 1 drink/week, though less then 1% were heavy drinkers or bingers. Men (33%) were more likely to drink than women (17%) and were 8 times more likely to binge ($P<.0001$). Drinking was more common among whites (35%) and African Americans (23%) than among Hispanics/Latinos (11%) and Chinese Americans (3%) ($P<.0001$). Binge drinking was most common among African Americans. Overall, the frequency of smoking was 11%, but was more common in elders who had heavy or binge drinking patterns (19.1% and 27.9%, respectively; $P<.0001$). In our sample, 26.5% of nondrinkers, 21.1% of moderate drinkers, 12.3% of at-risk drinkers, 25% of heavy drinkers, and 32% of binge drinkers lived alone ($P<.0001$; data not shown). Among drinkers, 24% had at least 1 recent episode of binge drinking. Although relatively common, binging is also associated with higher per week consumption (Table 2).

To identify the health impact of drinking, we examined the association between drinking patterns and self-rated depression/anxiety symptoms, general health status, and social support (see Table 3). Compared with moderate drinkers, nondrinkers were more likely to report symptoms of depression/anxiety, fair or poor general health, and lower social support. Similarly, those with heavy drinking or binging reported more symptoms of depression/anxiety and lower social support compared to moderate drinkers (2-sample t-tests, $P<.001$). Also, in these unadjusted analyses, binge drinking was associated with reporting general health as fair or poor. At-risk drinkers, conversely, reported rates of general health that were not statistically different from those of moderate drinkers (2-sample t-tests, $P>.05$).

To examine the health impact of drinking relative to other associated factors and to control for site variation, multivariate logistic regression models were developed (Table 4). In these models, binging was not a significant predictor of health status, unless it was further stratified by weekly drinking level. Table 4 presents the binge category modeled as 2 groups, those who drank ≤14 drinks/week and those who drank >14 drinks/week. Compared to moderate drinkers, nondrinkers, heavy drinkers, and bingers with heavy drinking were at significantly increased risk of reporting depressive/anxiety symptoms. Nondrinkers and bingers with heavy drinking were both at increased risk for rating their health as fair or poor. Nondrinkers and heavy drinkers were both at increased risk for feeling not loved and cared for. At-risk drinkers and bingers (≤ 14 drinks/week) did not differ significantly in health ratings when compared to moderate drinkers. Thus, after controlling for site, demographics, and smoking, binging combined with heavy drinking was associated with poorer heath outcomes, whereas binging without heavy drinking was not.

Female gender, smoking, living alone, and increased age were independently associated with depression/anxiety symptoms and a health rating of fair or poor. African Americans were more likely than whites to rate their health as fair or poor.

Table 1. Demographic Characteristics of Patients Seen in Primary Care by Alcohol Consumption Patterns*

	Nondrinkers (in past y) (n=17,392)	Moderate drinkers (1–7/wk) (n=5,338)	At-risk drinkers (8–14/wk) (n=1,012)	Heavy drinkers (≥15/wk) (n=270)	Binge drinkers (≥4 binges/3 mo) (n=851)†
Age group*					
65–74 y	67.7% (9336)	21.7% (2991)	4.6% (635)	1.3% (174)	4.8% (659)
75–85 y	72.0% (7192)	21.7% (2162)	3.5% (353)	0.9% (93)	1.9% (186)
>85 y	79.9% (864)	17.1% (185)	2.2% (24)	0.3% (3)	0.6% (6)
Gender*					
Male	67.0% (13,235)	23.0% (4,540)	4.6% (917)	1.3% (246)	4.1% (811)
Female	83.3% (3792)	14.3% (652)	1.5% (70)	0.3% (14)	0.5% (23)
Race/ethnicity*					
White	64.7% (11,501)	25.4% (4,517)	5.1% (907)	1.3% (234)	3.5% (614)
African American	77.0% (3,063)	15.4% (611)	1.9% (75)	0.6% (22)	5.2% (205)
Asian	96.7% (1,179)	2.5% (30)	0.3% (3)	0.0% (0)	0.3% (4)
Hispanic/ Lat	89.2% (1,193)	8.2% (109)	0.9% (12)	0.3% (4)	1.4% (19)
Other	80.2% (275)	13.1% (45)	2.6% (9)	2.0% (7)	2.0% (7)
Total	70.0% (17,392)	21.5% (5,338)	4.1% (1,012)	1.1% (270)	3.4% (851)

Percents are row percents. Chi-square tests of association have P<.0001 for each variable with drinking category

†*Of the 851 binge drinkers, 390 (46%) also reported consuming ≤14 drinks/week and 459 (54%) reported consuming >14 drinks/week*

Table 2. Binging Behavior Among Drinkers, *n*=7,471

	Total	Number of Binges in the Past 3 mo		
		None	1–3	≥4
Moderate drinkers	5,506	86.7% (4,776)	10.2% (562)	3.1% (168)
At-risk drinkers	1,235	59.8% (738)	22.2% (274)	18.1% (223)
Heavy drinkers	730	19.5% (142)	17.5% (128)	63.0% (460)
Overall	7,471	75.7% (5,656)	12.9% (964)	11.4% (851)

Percents are row percents

Women were less likely to report not feeling loved and cared for than men.

Discussion

In this sample of 24,863 patients screened at 36 primary care clinics, 4 findings emerged: 7.9% of older adults drank in excess of the NIAAA guidelines; binge drinking was common among all persons who consumed alcohol, not just heavy drinkers; heavy drinking was associated with an increased risk for depression/anxiety; and whites reported a higher rate of moderate drinking than African Americans.

We found that 9.2% of men and 2.1% of women drank in excess of the NIAAA guidelines for persons over 65. Other studies have used alternative definitions of "at-risk" drinking.[7,17,18] Using cut points of >7 drinks/week for women and >14 drinks/week for men, Adams found screen positive rates of 15% and 12% for men and women, respectively. Blow, using "at-risk" cut points of 9 or more drinks/week for women and 12 or more drinks/week for men, identified that more than 10% of the men and 3% of the women in an older primary care population drank at levels considered at-risk for alcohol problems.[17] Results from these studies are consistent with drinking rates in our white and age 65 to 75 groups. However, the results from this study offer a more ethnically and racially diverse cohort, including those in the oldest age group.

The majority (22%) of the alcohol users were moderate drinkers, although reported episodes of binge drinking were common amongst all drinkers (24%), demonstrating that binge drinking occurs across all categories. In our sample, frequent binge drinkers who were also heavy drinkers were more likely to report fair or poor health. Older adults' increased susceptibility to alcohol's toxic effects make these binge drinking findings critical because of the potential interactions of binging, medications, and co-occurring illness.[4]

In multivariate logistic models including African Americans and whites, heavy drinking, with and without binging, was associated with increased risk of depressive/anxiety symptoms and feelings of social isolation, even after controlling for age, gender, race, smoking status, and living arrangement. In accord with previous studies, nondrinking was associated with poorer health parameters, compared to moderate drinking.[18–20] This may be a complex interaction in which older individuals who once drank gave up drinking for health reasons, suggesting that their current nondrinking is a consequence of, rather than, a causal factor of poor health. Alternatively, moderate drinking might be a "protective" behavior for physical and social health.[21]

Alcohol-use patterns were consistent with earlier findings for gender,[7] with men reporting drinking more often (33%) than women (16.7%). There were also significant differences among ethnic groups with whites reporting moderate or at-risk drinking more frequently than African Americans, Hispanic/Latino Americans, and other ethnic minority elders. These findings are consistent with recent findings of male veterans in primary care.[22] Also consistent with previous findings, alcohol frequency and quantity declined with age.[2,23–26] This may represent a survival bias, with heavy drinkers either dying or stopping alcohol use at an earlier age. Heavy drinking and binging were consistently lower for Chinese-Americans and Hispanics. The absence of heavy drinking or binging among elderly Chinese Americans is consistent with other studies.[27,28]

Policy implications from this study for recommended alcohol intake are congruent with existing public health recommendations, which recommend no more than 1 drink per day.[19] Interestingly, in this study population, at-risk drinkers (8–14 drinks per week) did not differ significantly from moderate drinkers (1–7 drinks per week) in their characteristics or for the 3 variables evaluated—depression/anxiety symptomatology, perceived health, and perceived social support. Poor health parameters were more likely to be associated with heavy drinking and/or frequent alcohol binging, therefore, alcohol interventions are recommended for this group. These findings are consistent with findings by Chermack who noted that episodes of heavy drinking (5 or more drinks in 1 day) influ-

Table 3. Association Between Drinking Pattern and Self-rated Health Status and Social Support

	GHQ positive/depressioanxiety symptoms		General health rated fair or poor		Felt not loved or cared for	
Drinking pattern	No	Yes	No	Yes	No	Yes
Nondrinker (past y)	79.0% (13,728)	21.0%* (3,645)	53.4% (9,174)	46.6%* (8,006)	94.3% (16,127)	5.7%* (982)
Moderate drinker (1–7/wk)	85.2% (4,541)	14.8%§ (789)	70.0% (3,700)	30.0%§ (1,589)	97.3% (5,141)	2.7%§ (143)
At-risk drinker (8–14/wk)	83.5% (844)	16.5%‡ (167)	70.0% (700)	30.0%‡ (300)	97.0% (965)	3.0%‡ (30)
Heavy drinker (>15/wk)	74.7% (201)	25.3%* (68)	64.9% (174)	35.1%‡ (94)	94.0% (251)	6.0%* (16)
Binger (>4/3 mo)	78.3% (665)	21.7%* (184)	62.3% (524)	37.7%* (317)	95.1% (800)	4.9%* (41)
Binger & ≤14/wk	81.0% (316)	19.0%† (74)	64.6% (250)	35.4%† (137)	97.2% (377)	2.8%‡ (11)
Binger & > 14/wk	76.0% (349)	24.0%* (110)	60.4% (274)	39.7%* (180)	93.4% (423)	6.6%* (30)

*t-test between drinking category and moderate drinkers is significant at $P<.001$
†t-test between drinking category and moderate drinkers is significant at $.01<P<.05$
‡t-test between drinking category and moderate drinkers is not significant $P>.05$
§*Referent drinking category (moderate drinkers) for comparison t-tests*

Table 4. Logistic Regression Models of Health Status and Social Support as Predicted by Alcohol Consumption Pattern (OR and 95% confidence interval)

Predictors	GHQ positive/depression/ anxiety symptoms (*N*=20,651)	Perceived fair or poor health (*n*=20,459)	Not feeling loved and cared for (*n*=20,383)
Nondrinkers	1.43 (1.30, 1.57)	1.75 (1.63, 1.88)	1.54 (1.26, 1.88)
At-risk drinkers	1.11 (0.91, 1.35)	0.94 (0.80, 1.10)	1.02 (0.66, 1.57)
Heavy drinkers	1.79 (1.30, 2.45)	1.21 (0.92, 1.60)	2.01 (1.14, 3.54)
Bingers and ≤ 14 drinks/week	1.11 (0.82, 1.49)	1.02 (0.81, 1.29)	0.77 (0.41, 1.46)
Bingers and > 14 drinks/week	1.70 (1.33, 2.17)	1.27 (1.03, 1.57)	1.43 (0.91, 2.25)
Smokers	1.44 (1.29, 1.62)	1.38 (1.26, 1.52)	1.51 (1.24, 1.83)
Female	1.38 (1.15, 1.65)	1.16 (1.00, 1.34)	0.60 (0.41, 0.87)
Age 75–84	1.22 (1.13, 1.32)	1.24 (1.17, 1.32)	0.99 (0.85, 1.15)
Age ≥85	1.52 (1.28, 1.81)	1.68 (1.46, 1.95)	0.96 (0.68, 1.36)
African American	1.08 (0.95, 1.22)	1.67 (1.51, 1.85)	1.19 (0.96, 1.48)
Live alone	1.17 (1.07, 1.27)	1.14 (1.06, 1.22)	3.07 (2.65, 3.56)

Models are restricted to whites and African Americans and exclude the Chinatown Community Health Center Site. Moderate Drinkers are the referent alcohol category. All models control for Site

enced the rate of patients who reported alcohol symptoms even when controlling for average daily consumption.[29] These results imply that patterns of use may be more important than daily or weekly use.

Limitations of this study are: (1) findings may not be nationally representative of all elders in usual care and (2) information was collected on alcohol use only in the 12 months preceding the study and did not ascertain reasons for abstinence. Thus, the population of nondrinkers may be a combination of those who stopped drinking for health reasons and those who never drank. The cross-sectional nature of this study limits our ability to fully explore the associations found in the study. In addition, although there is some support for single-item assessment of health and social parameters, some of the outcomes are based on more comprehensive measures (e.g., the GHQ) than others (the perception of general health). Site and ethnic diversity were confounded; 1 site contributed 90% of the Chinese Americans, and another site contributed 75% of the Hispanic/Latino Americans; therefore, these older adults could not be included in the multivariate analysis. Data were not collected on education and income, 2 factors that have been shown to be associated with alcohol use patterns. Our initial question, "Do you use alcohol (yes/no)?" may have limited accurate reporting because multiple modes of screening were used or there may have been social desirability bias, both of which would have resulted in underestimation of at-risk drinking. However, 30% responded affirmatively to this question, suggesting that these were not substantial limitations. Finally, statistical significance must be interpreted within the context of the large sample size in which statistical significance may be associated with small relative differences.

This study is the largest reported convenience sample of elderly primary care patients with documented alcohol use, including the largest sample of primary care elderly, 75 and older. The study includes different ethnic populations and draws from diverse primary care settings, including public health clinics, academically affiliated clinics, large health systems, and VA clinics across multiple regions of the country. Though the majority of the older sample were nondrinkers, this study provides evidence that alcohol use in the elderly is common. The majority of alcohol users consumed moderate or at-risk amounts of alcohol based on total weekly consumption cut points, yet, patterns of abuse were frequent. While men were more likely than women to drink and drink heavily, women did use and abuse alcohol. Finally, in both bivariate and multivariate analyses, at-risk drinkers did not differ significantly from moderate drinkers in their characteristics or for the 3 health parameters evaluated. In contrast, heavy drinking was associated with depression and anxiety and less social support, and heavy drinking combined with binge drinking was associated with depressive/anxiety symptoms and perceived poor health.

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