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Older Adults' Alcohol Consumption and Late-Life Drinking Problems: A 20-Year Perspective

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Abstract

Aims—The aim was to identify changes in patterns of alcohol consumption over a 20-year interval among older women and men, and to examine the associations between guideline-defined excessive drinking and late-life drinking problems.

Design, Participants, and Measures—A community sample of 719 adults between 55 and 65 years of age who consumed alcohol at or prior to baseline participated in a survey of alcohol consumption and drinking problems and was followed 10 years and 20 years later.

Findings—The likelihood of excessive drinking declined over the 20-year interval as adults matured into their 70s and 80s. However, at ages 75–85, 27% of women and 49% of men consumed more than 2 drinks per day or 7 drinks per week. At comparable guideline levels of alcohol consumption, older men were more likely to have drinking problems than were older women. Consumption of more than 2 drinks per day or 7 drinks per week was identified as a potential conservative guideline for identifying excessive drinking associated with an elevated likelihood of drinking problems.

Conclusions—A substantial percentage of older adults who consume alcohol engage in guideline-defined excessive drinking and incur drinking problems. The finding that older men may be more likely than older women to experience problems when they drink beyond guideline levels suggests that alcohol guidelines for men should not be set higher than those for women.

Keywords

Alcohol; aging; drinking problems; gender differences

Introduction

A significant number of older adults have ongoing problems with alcohol. It has been estimated that between 10% and 50% of individuals age 60 or older drink in excess of current guidelines for alcohol consumption [1–4]. Even among adults 75 years or older up to 20–25% may engage in episodic heavy drinking [5,6]. Such excessive alcohol consumption contributes to elevated mortality, morbidity, and health care costs [7,8].

Most of the research on high-risk patterns of alcohol consumption and their associations with drinking problems has focused on mixed-age samples that include relatively few older adults [9–13]. Some cross-sectional findings on older adults show that alcohol consumption and heavy drinking tends to decline with age [3,5], and these findings have been supported

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by a recent longitudinal cohort study [6]. In general, however, it is not clear whether these declines in alcohol use are linked to reductions in older adults' drinking problems, or, if so, whether there are gender differences in any such reductions.

To examine these issues, we use longitudinal data from a community sample of older women and men to address two sets of questions: (1) Among older adults who consume alcohol, how frequently do they drink and what proportion engage in guideline-defined excessive patterns of consumption? Does this proportion decline over a 20-year interval from ages 55–65 to ages 75–85? Are there gender differences in excessive patterns of alcohol consumption and in changes in these patterns over time? (2) What is the association between alternative guidelines for excessive alcohol consumption and late-life drinking problems, and do these associations vary by age or gender? Are older adults who exceed alcohol consumption guidelines more likely to incur drinking problems at ages 75–85 than at ages 55–65?

Patterns of Late-Life Alcohol Consumption

Several guidelines have been proposed to identify high-risk drinking patterns in mixed-age populations. General nutritional guidelines recommend limits of no more than 1 drink per day for women and 2 drinks per day for men [14]. The National Institute on Alcohol Abuse and Alcoholism [15] has advised limits of no more than 3 drinks per day or 7 drinks per week for women and no more than 4 drinks per day or 14 drinks per week for men. The American Geriatrics Society [16] has defined high-risk drinking as more than 3 drinks on heavier drinking occasions or more than 7 drinks per week for adults 65 and older.

These and other comparable guidelines have been examined in mixed-age populations [17], but only a few studies have focused on older adults and these have used widely varying definitions of high-risk drinking [18]. Among current drinkers, up to 12% of women and 30% of men age 60 or older sometimes consume 3 or more drinks on one occasion [3,19–21]. With respect to weekly limits, about 45% of adults 60 years of age or older who are current drinkers consume an average of more than 7 drinks per week and about 25% consume an average of more than 14 drinks per week [2–5].

Consistent with these findings, in an earlier study of older adults who consumed alcohol, we found that 38% of women and 52% of men aged 55–65 consumed 3 or more drinks/day or 7 or more drinks/week [22]. Here, we report on a 20-year follow-up of this sample, examine the frequency of alcohol consumed by older women and men as they mature from ages 55–65 to 75–85, and estimate the proportion of these older adults who drink in excess of conservative (more than 2 drinks per day or 7 drinks per week) and more liberal (more than 3 drinks per day or more than 14 drinks per week) guidelines.

Alcohol Consumption and Late-Life Drinking Problems

Only a few studies have examined the connections between patterns of alcohol consumption and alcohol-related problems among older adults. The findings show that higher consumption levels are associated with a greater likelihood of subsequent alcohol-related problems [23] and that adults over age 55–60 who consume 5 or more drinks on one day or more than 7 drinks per week are more likely to experience alcohol-related symptoms than are older adults who consume less alcohol [24,25].

One important issue that arises with respect to current guidelines is whether they should be different for women than for men. Gender differences in the absorption of ethanol and its probable effects suggest the desirability of lower consumption guidelines for women. However, compared to men, women may drink at a slower pace and prefer drinks with meals and with less alcohol content, so that a comparable number of drinks may have less

influence on women than on men [22,26]. We address these issues here by focusing on the association between alternative guidelines for daily and weekly alcohol consumption and the presence of drinking problems as older adults mature from ages 55–65 to 75–85, and examining whether older women who exceed drinking guidelines are more likely to have drinking problems than are older men.

Method

Participants

A sample of 1,884 late-middle-aged community residents (55–65 years old at baseline) was recruited from the western part of the United States to participate in a study of late-life alcohol consumption and drinking problems. Because we wanted to study alcohol consumption and drinking problems among older adults, we used a screening procedure to exclude individuals who had never consumed alcohol. The sample was composed of individuals who were born between 1921 and 1933 and had consumed alcohol in the past year or shortly before. These individuals had had outpatient contact with a health care facility within the last three years and were comparable to similarly aged community samples with regard to such health characteristics as prevalence of chronic illness and hospitalization [27]. Informed consent was obtained from all participants; additional details about recruitment are available elsewhere [28–29].

We contacted these individuals again 10 and 20 years later. By the 10-year follow-up, 489 individuals had died, and by the 20-year follow-up, an additional 480 individuals had died. Of the 915 participants who were still living, 76 (8.3%) were in very poor health, as reported by the participant or by a spouse or close family member, and could not participate in the 20-year follow-up. Of the remaining 839 participants, 719 (85.7%) completed the 20-year follow-up. At all three waves (baseline, 10 years, 20 years), the data were collected by a combination of mail and telephone surveys.

The 20-year follow-up sample was composed of 320 women and 399 men. At baseline, these participants were just under 61 years of age on average; almost 90% were Caucasian and about 75% were currently married. The majority (81%) had at least a high school education. A total of 60% were employed and their average family income was US\$44,000. Overall, 92% of the participants had consumed alcohol in the two years prior to baseline; the other 8% had consumed alcohol earlier in their life.

Compared to surviving individuals who were not followed at 20 years (N=120), those who were followed (N=719) were more likely to be Caucasian (93% to 86%), to have completed high school (81% to 73%), and to have been employed at baseline (60% to 42%). The two groups did not differ significantly in age or marital status. Moreover, there were no significant group differences at baseline in the proportion of individuals who exceeded alternative drinking guidelines or had drinking problems.

Measures

Alcohol consumption was assessed with items adapted from the Health and Daily Living Form [30]. The frequency of alcohol consumption was assessed by responses to three questions asking how often per week (never, less than once, once or twice, three to four times, nearly every day) participants consumed wine, beer, and hard liquor in the last month. When a respondent reported consuming two or three beverages, we could not ascertain whether these beverages were consumed on the same day or on different days. Thus, we estimated the frequency of alcohol consumption and number of drinks per day based on each of these two possibilities and averaged them.

The number of drinks consumed per day and per week was assessed by combining information about the frequency of consumption of each beverage and additional items that tapped the usual and largest number of drinks of wine (in glasses), beer (in glasses or cans), and hard liquor (in shots) consumed on days in the last month when the individual drank that beverage.

We also estimated the largest daily amount of alcohol consumption, as assessed by questions that asked about the largest amount of wine, beer, and hard liquor participants consumed on any one day in the last month. We converted the responses to reflect the ethanol content of these beverages and summed them. The definition of a standard drink was 0.6 fluid ounces of 100% ethanol which is found, for example, in a 5-ounce glass of wine (12% alcohol), a 12-ounce can of beer (5% alcohol), or a 1.5 ounce shot of 80-proof hard liquor [31]. There is evidence supporting the validity of these types of self-report measures of alcohol consumption for mixed-age and older adults [32–35].

An index of Drinking Problems in the last 12 months was composed of 12 items drawn from the Drinking Problems Index (DPI). The DPI has been used in a number of studies and has high internal consistency ($\alpha = 0.94$) and good construct and predictive validity [36,37]. The 12 items were selected because they tapped functioning problems, such as whether the individual skipped meals, neglected daily activities, or had had a fall or accident due to drinking; and interpersonal problems, such as whether family members or friends had expressed concerns about the participant's drinking or a friend had been lost due to drinking. The 12-item version of the DPI has high internal consistency (Cronbach's $\alpha = .92$; average corrected item-total score correlations = .71 with a range from .58 to .78), and moderate to high stability over 1-year, 3-year, and 4-year intervals ($r_s = .56, .57$, and $.53$, respectively), and is highly correlated with the original 17-item DPI ($r = .91$). In addition, the 12-item version is predictably associated with a history of heavy drinking and drinking problems, trying to cut down on and seeking help for drinking, friends' approval of drinking, smoking, use of psychoactive medications, and reliance on avoidance coping [38,39].

The items were dichotomized (yes/no); individuals who endorsed two or more of the items were considered to have a drinking problem. We initially chose this cut-point [27,29] to link our definition of problem drinking to DSM-III-R criteria for alcohol abuse [40]; we continue to use it here to link to DSM-IV criteria for alcohol abuse, which include continued alcohol use despite an associated social, psychological, or physical alcohol-related problem [41]. The presence of two problems increases the confidence that individuals who score positive have ongoing or recurrent alcohol-related problems.

Analytic Plan

We conducted repeated measures analyses of variance (RMANOVAs) to examine the change from baseline to the 10-year and 20-year follow-ups, gender differences, and gender by time interactions in the frequency of drinking and in guideline-based indices of excessive levels of alcohol consumption. Then, for alternative indices of daily and weekly drinking, we conducted two-way analyses of variance (ANOVAs), separately at baseline and the 10-year and 20-year follow-ups, to examine whether the percent of individuals with drinking problems varied by guideline adherence and gender.

We conducted two sets of Missing Value Analyses (MVAs) to identify potential bias due to missing data. In the first set, we examined the influence of missing data on the alcohol consumption and drinking problem variables among individuals who responded to the 20-year follow-up ($N = 719$). Little's MCAR (Missing Completely at Random) was not significant ($p > .01$) for any of these variables. In the second set, we examined the influence of missing data in the overall sample of surviving individuals who could have participated in

the 20 year follow-up (N = 839). Little's MCAR test was not significant ($p > .01$) for abstinence, frequency of alcohol consumption, drinks per week, or drinking problems; however it was significant for drinks per day (Chi Square = 21.72, $df = 5$, $p < .01$).

We also estimated the sensitivity, specificity, and overall accuracy of the more conservative and more liberal combined daily and weekly guidelines. Sensitivity was defined as the percent of individuals whose alcohol consumption exceeded the guideline and who had a drinking problem; that is, the percent of correctly identified positive cases. Specificity was defined as the percent of individuals whose alcohol consumption was within the guideline and who did not have a drinking problem; that is, the percent of correctly identified negative cases. Accuracy was defined as the percent of individuals who exceeded the guideline and had a drinking problem or drank within guideline limits and did not have a problem.

Results

Alcohol Consumption

At baseline, more than 90% of women and men had consumed alcohol in the past month and, on average, they consumed alcohol more than three days per week (Table 1). Compared to women, men were more likely to drink in excess of separate and combined daily and weekly guidelines. At baseline, a total of 49% of women and 65% of men consumed more than 2 drinks per day or more than 7 drinks per week; 26% of women and 49% of men drank more than 3 drinks per day or 14 drinks per week.

The percentage of drinkers declined modestly and similarly for women and men over the 20 years, as did the frequency of drinking and the prevalence of drinking beyond separate and combined daily and weekly guidelines. These changes were equally apparent among women and men; that is, there were no significant time by gender interactions.

To determine whether these reductions in drinking held for individuals who continued to drink or reflected the increased percentage of abstainers, we conducted comparable analyses among individuals who continued to drink over the 20 years (N = 235 women and N = 297 men). The frequency of drinking declined significantly from baseline to the 20-year follow-up among these individuals, as did the percentage whose drinking exceeded each of the separate and combined guidelines (not shown).

Alcohol Consumption and Late-Life Drinking Problems

At baseline, when participants were 55–65 years of age, a considerable proportion of individuals who exceeded the separate or combined daily and weekly recommended levels of alcohol consumption were likely to have drinking problems (Table 2). For example, 21% of women and 34% of men who consumed more than two drinks per day or 7 drinks per week had drinking problems; these percentages rose to 27% of women and 41% of men who consumed more than 3 drinks per day or 14 drinks per week.

Without exception, men who exceeded the guidelines were more likely to have drinking problems than women who exceeded the guidelines. There were four significant interactions between adherence to the guidelines (1=yes; 0=no) and gender (1=female; 0=male) such that, compared with women, men experienced a greater increase in the likelihood of drinking problems when they exceeded guidelines compared to when they did not.

We obtained generally comparable results at the 10-year (not shown) and the 20-year (Table 3) follow-ups. At the 20-year follow-up, when participants were 75–85 years of age, a considerable proportion of those who exceeded guidelines reported drinking problems (Table 3). A total of 8% of women and 22% of men who had more than 2 drinks per day or

7 drinks per week reported problems, as did 15% of women and 30% of men who had more than 3 drinks per day or 14 drinks per week. As at baseline, men were more likely than women to report problems at each level of excessive drinking. There also were several interactions such that, compared with women, men again experienced a greater increase in the likelihood of drinking problems when they exceeded guidelines.

Sensitivity, Specificity, and Accuracy of Guidelines

The sensitivity and accuracy of the more liberal guidelines (no more than 3 drinks per day or 14 drinks per week) were higher than those of the more conservative guidelines (no more than 2 drinks per day or 7 drinks per week), but their specificity was somewhat lower (Table 4). Because more older adults exceed conservative than liberal guidelines (see Table 1), the conservative guidelines identify a larger number of individuals with alcohol problems. However, they also identify a larger number of false positives; that is, individuals who exceed guidelines but do not have drinking problems. A higher proportion of individuals who exceed more liberal guidelines have drinking problems but, since fewer individuals exceed these guidelines, they identify fewer individuals with drinking problems.

Individuals Lost to Follow-up Due to Poor Health or Mortality

We wondered whether the findings on the prevalence of high-risk patterns of alcohol consumption and their association with drinking problems would apply to older adults lost to follow-up due to poor health or mortality. To consider this issue, we focused on individuals who participated at baseline and 10 years but were lost to the 20-year follow-up due to poor health ($N = 67$) or mortality ($N = 423$; overall $N = 490$). At baseline, individuals lost to the 20-year follow-up were comparable to 20-year participants on the percent of individuals who drank in excess of separate or combined daily and weekly guidelines and the percent who had drinking problems.

RMANOVAs like those in Table 1 indicated that, just as 20-year participants, individuals who were lost to the 20-year follow-up declined significantly between baseline and 10 years in the frequency of alcohol consumption and the likelihood of exceeding separate and combined daily and weekly drinking guidelines. There also were comparable gender differences in that men were more likely to exceed the guidelines than women were.

In addition, ANOVAs like those in Table 2 showed similar associations at baseline between exceeding the separate and combined daily and weekly guidelines and drinking problems among individuals lost to the 20-year follow-up as among 20-year participants. These findings held at the 10-year follow-up. There also were comparable gender differences in that men were more likely than women to experience drinking problems at both daily and weekly levels of excessive drinking.

Subsidiary Analyses

Gender Differences in Drinking Problems—We considered why men who were drinking in excess of suggested guidelines were more likely to have drinking problems than were women. We thought that the most likely explanation was that, compared to women who exceeded guidelines, men who exceeded guidelines consumed more drinks and a larger maximum volume of alcohol. To examine this idea, we selected women and men in the 20-year follow-up sample who exceeded the combined conservative or liberal daily and weekly guidelines.

Using these subgroups at baseline, 10 years, and 20 years, we conducted t-tests comparing their largest number of drinks and highest amount of alcohol consumed in one day. In all comparisons, men consumed significantly more drinks per day and more alcohol than

women did. For example, among individuals who exceeded the guideline of more than 2 drinks per day or 7 drinks per week at baseline, the largest number of drinks per day was 6.3 for men versus 5.0 for women ($t = 6.08$; $p < .01$) and the highest amount of ethanol consumed in one day was 5.2 ounces for men versus 4.0 for women ($t = 4.47$; $p < .01$). Among individuals who exceeded this guideline at the 20-year follow-up, the largest number of drinks per day was 5.1 for men versus 4.3 for women ($t = 3.51$; $p < .01$) and the highest amount of ethanol consumed in one day was 3.5 ounces for men versus 2.9 for women ($t = 2.84$; $p < .01$).

Reductions in Problems associated with High-Risk Drinking—As shown by comparing the findings in Tables 2 and 3, the likelihood of drinking problems decreased over the 20-year interval, even among participants who exceeded guidelines. Again, we suspected that this was because individuals who exceeded guidelines had decreased their highest levels of daily drinking and alcohol consumption. To consider this issue, we conducted paired t-tests on individuals who exceeded the combined guideline of more than 2 drinks per day or 7 drinks per week at both baseline and the 20-year follow-up, and who had drinking problems at baseline but not at the 20-year follow-up.

These individuals consumed fewer drinks per day (3.7 versus 4.5; $t = 3.74$; $p < .01$), fewer drinks per heavy drinking occasion (4.5 versus 7.1; $t = 8.02$; $p < .01$), and less alcohol on maximum drinking occasions (3.3 versus 6.5 ounces; $t = 6.06$; $p < .01$) at 20 years than at baseline. Comparable findings held for individuals who exceeded the combined guideline of more than 3 drinks per day or 14 drinks per week at both baseline and the 20-year follow-up and who had drinking problems at baseline but not at 20 years.

Discussion

Alcohol Consumption and Drinking Guidelines

A substantial proportion of older adults who consumed alcohol engaged in patterns of consumption that exceeded suggested guidelines. Consistent with prior reports [3,5,20,21] and our earlier findings [22], older men were more likely than older women to drink in excess of current guidelines. At baseline, 49% of women and 65% of men exceeded 2 drinks per day or 7 drinks per week and more than 26% of women and 49% of men exceeded 3 drinks per day or 14 drinks per week. These percentages are comparable to but somewhat higher than prior estimates of currently drinking older adults who engage in excessive alcohol consumption [2–5,21] perhaps because of the somewhat younger average age (55–65) of our sample at baseline.

The prevalence of guideline-defined excessive drinking declined over the 20-year interval as individuals progressed from the ages of 55–65 to 75–85. This decline occurred among participants overall, among individuals who continued to drink, and among women and men. These findings provide new evidence of a slow but steady age-related decline in alcohol consumption among women and men with advancing age [3,5–6,20,25]. However, these declines coincide with a reduction in alcohol consumption among Americans overall, making it difficult to distinguish age from period effects [6,42–43]. Our cohort also grew up during and shortly after the era of prohibition in the United States and thus may have been more likely to curtail their drinking than more recent cohorts, who reached young adulthood at a time of greater acceptance of alcohol use.

4.2 Alcohol Consumption and Late-Life Drinking Problems

Alcohol consumption in excess of daily or weekly guidelines was associated with an elevated risk of drinking problems among older adults. This finding is consistent with the

few existing findings on this age group [23–25] and with prior studies of younger and mixed-age groups [10–11,13,17,44–45]. At baseline, more than half the individuals in our sample consumed more than 2 drinks per day or 7 drinks per week, and more than 21% of women and 34% of men who exceeded these limits had drinking problems. Thus, these more conservative guidelines, which may err on the side of caution, apply to a substantial proportion of older adults who consume alcohol and identify a large number who have drinking problems.

A considerable proportion of individuals also exceeded the more relaxed guideline and, at baseline, 27% of the women and 41% of the men who exceeded this guideline had drinking problems. Although there is some arbitrariness in opting for one guideline over the other, the more conservative limits identify a larger number of older adults who are drinking excessively and are likely to incur alcohol-related problems. In addition, it seems most appropriate that consumption guidelines for older adults encompass both daily and weekly limits. The combined limits provide a clearer idea about permissible alcohol consumption and apply to individuals who drink on most or all days, as well as to those who drink more heavily only on weekends or special occasions.

Overall, the more conservative limits of no more than 2 drinks per day or 7 drinks per week may be the preferred guideline for identifying potential high-risk drinking for relatively healthy older adults. The limit of two drinks per day is consistent with the association between consumption of more than two drinks per day and a higher risk of impairment in activities of daily living [46] and of injuries and several cancer-related conditions [47]. In addition, United States national guidelines and recommendations indicate that low risk drinking for older adults may be as little as one drink per day and a maximum of two drinks per occasion, especially for individuals who have co-existing health problems, such as hypertension or diabetes, or are using medications that may interact with alcohol [15,48]. This guideline also may be appropriate for individuals who have a history of heavy drinking and drinking problems, because, even after considering their alcohol consumption, they have a higher likelihood of developing late-life drinking problems [38,39].

Compared to older women, older men who exceeded drinking guidelines were more likely to have drinking problems. This gender difference occurred in part because men who exceeded guidelines consumed more drinks on regular and heavy drinking occasions and more alcohol than women did. In addition, compared to women, men may drink more rapidly, consume more of the drinks served to them, be less likely to drink with meals, and concentrate their drinking over a shorter interval [26]. Men who exceed guidelines may engage in drinking behavior associated with higher levels of alcohol consumption, resulting in more harmful drinking consequences. These considerations support the idea that alcohol consumption guidelines for older men should not exceed those recommended for older women.

Among older adults who exceeded alcohol consumption guidelines, the rate of drinking problems was lower when individuals were 75–85 years of age than when they were 55–65 years of age. Reductions in the number of drinks and amount of alcohol consumed on heavy drinking occasions partially explained this finding. Many older adults may make subtle shifts within relatively stable patterns of alcohol consumption that enable them to continue to enjoy alcohol, but to do so in ways that reduce the likelihood of experiencing drinking problems. In addition, fewer problems may arise because there are relaxed norms and less “surveillance” of older adults, who may be more likely to drink alone and less likely to have family members or friends recognize their excessive drinking. Another point is that individuals who participated in the 20-year follow-up had been drinking regularly for many years and likely had developed some tolerance for alcohol.

About 5% of individuals whose alcohol consumption was below guidelines for at-risk drinking nevertheless had drinking problems. These may have been individuals who had specific medical conditions or were taking medications that interacted with alcohol and elevated the risk of drinking problems. Low-risk levels for these older adults may be as little as an average of one drink per day and a maximum of one drink on “heavy” drinking occasions, and some of them may not be able to consume any alcohol at all [15,48]. More information is needed about specific health problems and medications that raise the risk of harmful or hazardous drinking [1,4].

4.3 Attrition due to Poor Health or Mortality

A substantial number of individuals participated in the study at baseline and 10 years, but were lost to the 20-year follow-up due to poor health or mortality. At baseline, these individuals were comparable to 20-year participants in terms of the amount of alcohol consumption and the proportion who drank in excess of guidelines. Moreover, just as 20-year participants, these individuals declined significantly between baseline and 10 years in the frequency and amount of drinking and showed comparable gender differences and associations between alcohol consumption that exceeded guidelines and drinking problems. Accordingly, the overall findings based on 20-year participants appear to generalize to individuals lost to the 20-year follow-up.

4.4 Limitations and Conclusions

We recruited a community sample of non-abstinent individuals who consumed more alcohol than individuals in a representative population sample. Thus, the proportions of older women and men who exceeded alcohol consumption guideline thresholds and the prevalence of drinking problems were relatively high and cannot be taken as population estimates. Furthermore, our sample was drawn from one geographic region in the United States and was composed mainly of Caucasian and relatively well-educated individuals; the findings are specific to this cohort and need to be replicated on more diverse groups of older adults with different previous drinking experiences. Nevertheless, the findings show that many older adults who consume alcohol drink in excess of guideline limits and continue to do so well into their late 70s and early 80s.

On a related point, we assessed drinking problems specifically relevant to older adults; some of these problems might be considered to be relatively minor, such as neglecting one's appearance due to drinking. To the extent that this is the case, our findings may overestimate the extent to which low levels of alcohol consumption are associated with drinking problems that are of more serious concern, such as driving under the influence of alcohol.

In conclusion, our findings support the idea that appropriate conservative guidelines for older adults up to age 75–85 who regularly consume alcohol may be no more than 2 drinks on heavy drinking occasions and no more than 7 drinks per week, and that these guidelines should be comparable for older women and men. Future research needs to focus on the identification of health status indices that may influence changes in late-life drinking patterns and problems, the desirability of espousing more conservative guidelines for older individuals in poor health, and clearer identification of the nature and severity of specific problems associated with high-risk late-life alcohol consumption. Most important, to provide more useful consumption guidelines for older adults, we need to specify how these individuals can maintain relatively stable patterns of moderate alcohol consumption that may be associated with better health [3,49] without incurring drinking problems.

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Table 1

Alcohol Consumption of Women (N = 320) and Men (N = 399) over the 20-Year Interval

Index of Consumption	Assessment Interval				F (time)	F (gender)	F (time × gender)
	Baseline	10-Years	20-Years				
Drank Alcohol (%)					48.14**	< 1	2.54
Women	93.9	85.0	78.7				
Men	90.0	85.2	80.3				
Frequency (Days/Wk)					30.34**	4.25*	1.15
Women	3.47	3.06	2.76				
Men	3.70	3.54	3.11				
Daily Consumption							
2+ Drinks/Day (%)					63.82**	52.19**	< 1
Women	43.9	37.6	21.3				
Men	63.2	58.3	44.5				
3+ Drinks/Day (%)					42.26**	75.80**	< 1
Women	22.9	15.9	8.0				
Men	45.0	39.6	26.9				
Weekly Consumption							
7+ Drinks/Week (%)					38.10**	21.42**	< 1
Women	39.3	31.9	24.0				
Men	52.2	48.1	36.8				
14+ Drinks/Week (%)					16.54**	35.32**	1.21
Women	16.0	12.1	8.3				
Men	29.8	29.0	20.6				
Daily or Weekly Consumption							
2+ Drinks/Day or 7+ Drinks/Week (%)					60.85**	41.93**	< 1
Women	49.0	43.3	27.1				
Men	65.5	63.2	48.6				
3+ Drinks/Day or 14+ Drinks/Week (%)					40.25**	69.55**	< 1
Women	26.1	19.7	11.8				

Index of Consumption	Assessment Interval				F (time)	F (gender)	F(time × gender)
	Baseline	10-Years	20-Years				
Men	49.2	43.8	31.8				

p < .05;
**
p < .01

Table 2

Percentage of Women (N=320) and Men (N=399) with Drinking Problems (2+ of 12) at Baseline as a Function of Number of Drinks per Day and per Week

Index of Consumption	Gender Group		F(drinks)	F(gender)	F(drinks × gender)
	Women	Men			
Daily Consumption					
0 – 2 Drinks/Day	2.3	4.1	93.59**	6.33*	2.98
2+ Drinks/Day	23.8	35.2			
0 – 3 Drinks/Day	6.6	8.2	111.09**	4.03*	4.24*
3+ Drinks/Day	28.9	42.8			
Weekly Consumption					
0 – 7 Drinks/Week	3.1	6.3	110.78**	9.82**	4.65*
7+ Drinks/Week	24.8	39.6			
0 – 14 Drinks/Week	6.8	11.9	134.14**	6.80**	1.78
14+ Drinks/Week	37.0	50.8			
Combined Daily and Weekly Consumption					
2 or fewer Drinks/Day and 7 or fewer/Week	2.5	3.6	81.29**	8.20**	4.46*
2+ Drinks/Day or 7+ Drinks/Week	21.4	34.4			
3 or fewer Drinks/Day and 14 or fewer/Week	6.4	6.0	112.41**	3.29	6.94**
3+ Drinks/Day or 14+ Drinks/Week	26.7	41.4			

*
p < .05;

**
p < .01

Table 3

Percentage of Women (N=320) and Men (N=399) with Drinking Problems (2+ of 12) at the 20-Year Follow-up as a Function of Number of Drinks/Day and per Week

Index of Consumption	Gender Group		F(drinks/week)	F(gender)	F(drinks × gender)
	Women	Men			
Daily Consumption					
0 – 2 Drinks/Day	0.8	2.7	63.83**	7.53*	7.14**
2+ Drinks/Day	9.9	23.2			
0 – 3 Drinks/Day	1.4	5.1	89.98**	5.92**	1.63
3+ Drinks/Day	19.2	30.5			
Weekly Consumption					
0 – 7 Drinks/Week	1.3	3.2	69.34**	13.83**	17.67**
7+ Drinks/Week	7.6	27.1			
0 – 14 Drinks/Week	1.4	5.4	109.62**	10.12**	7.68**
14+ Drinks/Week	17.2	37.0			
Combined Daily and Weekly Consumption					
2 or fewer Drinks/Day and 7 or fewer/Week	0.9	2.0	57.82**	9.13**	10.76**
2+ Drinks/Day or 7+ Drinks/Week	7.9	22.3			
3 or fewer Drinks/Day and 14 or fewer/Week	1.1	3.3	107.63**	5.88*	7.09**
3+ Drinks/Day or 14+ Drinks/Week	15.0	30.4			

* p < .05;

** p < .01

Table 4

Sensitivity, Specificity, and Accuracy of Predicting Drinking Problems at from Combined Daily/Weekly Alcohol Consumption Guidelines

Index	Sensitivity ^a	Specificity ^b	Accuracy ^c
Baseline			
2+ Drinks/Day or 7+ Drinks/Week			
Women	21.4	97.5	59.7
Men	34.4	96.4	55.6
3+ Drinks/Day or 14+ Drinks/Week			
Women	26.7	93.6	75.6
Men	41.4	94.0	67.8
20 Years			
2+ Drinks/Day or 7+ Drinks/Week			
Women	7.9	100.0	73.7
Men	22.3	98.0	61.2
3+ Drinks/Day or 14+ Drinks/Week			
Women	15.0	98.9	88.4
Men	30.4	96.7	75.8

^aPercent of individuals who exceed guidelines who have drinking problems

^bPercent of individuals within guidelines who do not have drinking problems

^cPercent of individuals who exceed guidelines and who have drinking problems and those within guidelines who do not have drinking problems