At-Risk Drinking and Outpatient Healthcare Expenditures in Older Adults

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OBJECTIVES: To compare 12-month outpatient healthcare expenditures of at-risk and not-at-risk drinkers aged 60 and older.

DESIGN: Secondary analysis of data from Project Senior Health and Alcohol Risk Education, a cluster, randomized trial to test the efficacy of an intervention to reduce at-risk drinking.

SETTING: Seven primary care clinics in or near Santa Barbara, California.

PARTICIPANTS: Current drinkers aged 60 and older who completed a baseline survey (N = 2,779) and did not receive the study intervention, including 628 at-risk drinkers and 2,151 not-at-risk drinkers.

MEASUREMENTS: Comparisons of at-risk and not-at-risk drinkers for baseline demographic characteristics, health indicators, alcohol consumption, and adjusted and unadjusted outpatient healthcare expenditures incurred over 12 months after baseline.

RESULTS: At-risk drinkers were younger, more often male, and more likely to be married and had higher education and incomes than not-at-risk drinkers. Unadjusted 12-month mean outpatient healthcare expenditures were $1,333 ± 2,973 for at-risk drinkers and $1,417 ± 2,952 for the not-at-risk drinkers. There were no statistically significant differences in expenditures between groups before and after controlling for sociodemographic and health characteristics.

CONCLUSION: In this short-term study, no adjusted differences in healthcare expenditures were observed between at-risk and not-at-risk older drinkers. Future study is warranted to determine the role of at-risk drinking in long-term healthcare expenditures in older adults. **J Am Geriatr Soc 62:325–328, 2014.**

Key words: alcohol use; at-risk drinking; healthcare expenditures

Older adults are more susceptible to alcohol-related consequences than younger adults because of age-related physiological changes that result in higher blood alcohol levels for a given dose of alcohol,[1] greater age-associated morbidity, and greater medication use with the potential for harmful alcohol–medication interactions.[2]

A substantial number of older adults are at-risk drinkers; that is, their consumption of alcohol exceeds recommended drinking limits (e.g., >14 drinks/wk for men aged <65, and >7 drinks/wk for men aged ≥65 and all women)[3] or their use of alcohol is potentially harmful given their comorbidities and medication use.[4–7] In a population-based sample of U.S. adults, 18% of men and 5% of women aged 60 and older were at-risk drinkers, and at-risk drinking has been associated with 20% greater mortality in older men.[5] Existing research has examined economic costs of excessive alcohol consumption in the United States ($223.5 billion in 2006), including healthcare costs ($24.6 billion).[8] Others have examined healthcare expenditures of individuals who abuse alcohol[9] and of those with varying alcohol consumption patterns (e.g., former drinkers vs nondrinkers and current drinkers).[9–12] These studies suggest that former drinkers tended to have higher healthcare costs than nondrinkers,[9,11] but none have examined outpatient healthcare expenditures of older adults who are considered at-risk drinkers because of the amount of alcohol they consume or comorbid conditions that may increase risk. Healthcare expenditures might be higher in this population of at-risk drinkers because of the interaction between alcohol and comorbidities than in younger adults. The current study examined these expenditures in older at-risk drinkers and compared them with

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those of older adults who drink alcohol but who are not identified as at-risk drinkers.

METHODS

Setting

This study used data from Project Senior Health and Alcohol Risk Education (SHARE), a cluster randomized trial testing the efficacy and examining the costs of an intervention to reduce at-risk drinking in adults aged 60 and older in primary care. The study population was drawn from a community-based group practice with seven clinics in or near Santa Barbara, California. Randomization occurred at the physician level (N = 31). The baseline data were collected from June 2005 to July 2007.

Study Participants

Project SHARE has been described in detail elsewhere.[6] Clinic information technology personnel identified all patients aged 60 and older who were seeing participating physicians. Of the 3,529 persons who had participating physicians, who had drunk at least one alcoholic beverage in the prior 3 months, and who returned a baseline survey, 1,186 were identified as at-risk drinkers and 2,318 as not-at-risk drinkers. Of the at-risk drinkers, 546 were seeing physicians assigned to the intervention group, and 640 were seeing physicians assigned to the control group. Of the at-risk drinkers, only those who were not in the intervention arm of the study were included, because it was hypothesized that the intervention might influence healthcare expenditures. Twelve at-risk drinkers in the control arm and 167 not-at-risk drinkers were eliminated from the analytical sample because of missing data, leaving a sample of 2,779 persons.

At-Risk Drinking

At-risk drinkers were identified using the Comorbidity Alcohol Risk Evaluation Tool (CARET), whose precursor is the Alcohol-Related Problems Survey.[13] It uses information on amount of alcohol use, hazardous drinking behaviors, comorbidity, symptoms, and medications to assess drinking risks.[4,6,13,14] Using previously defined scoring algorithms for the CARET, older adults were identified as being at risk for harm from their alcohol consumption if they met criteria for at least one of the following three categories: *unhealthy alcohol use behaviors* (e.g., exceeding a particular quantity and frequency of alcohol use, engaging in binge drinking (e.g., ≥4 drinks per occasion), driving within 2 hours of having ≥3 drinks, or having someone be concerned about their drinking); *unhealthy alcohol use and comorbidities* (defined as the combination of defined amounts of alcohol considered potentially harmful with select comorbidities, e.g., gout, hypertension, hepatitis) or symptoms (e.g., nausea, falls, insomnia); and *unhealthy alcohol use and medications* (defined as the combination of defined amounts of alcohol considered potentially harmful with select medications (e.g., antidepressants, sedatives)). Not-at-risk drinkers were those who did not meet criteria for any of the at-risk drinking categories.

Healthcare Expenditures

Outpatient healthcare expenditures in the 12 months after the date each participant's baseline survey data were collected were estimated. These healthcare expenditures were estimated by linking the Current Procedural Terminology codes from 2004 to 2008 encounter data at the participating clinical sites to the 2007 Medicare fees for those codes, adjusting for inflation or deflation.

Covariates

To address potential confounding in the association between healthcare expenditures and at-risk drinking, age, sex, race and ethnicity, education, marital status, annual household income, and home ownership were controlled for in the statistical analyses. Medical Outcomes Study 12-item Short-Form Survey (SF-12) physical and mental component summary scores and indicator variables for having any comorbidities and taking any medications were included as covariates. This latter set of confounders was included as certain types of at-risk drinking are defined by combinations of comorbidities and medications that also influence expenditures.

Statistical Analysis

Bivariate analyses were performed to compare unadjusted differences between not-at-risk drinkers and at-risk drinkers in demographic characteristics, health indicators, and alcohol consumption. Chi-square tests were used for categorical variables and analyses of variance for continuous variables.

Because of the skewed distribution of healthcare expenditures, the Wilcoxon–Mann–Whitney test was used to compare the unadjusted mean differences of at-risk and not-at-risk older drinkers. A linear regression of the square root of expenditures was performed to test adjusted associations, controlling for the covariates described above. The data were transformed to better approximate a normal distribution, facilitating efficiency of the estimates. Square root transformation was chosen over log transformation because the former, but not the latter, can be applied to 0 values. Subgroup-specific "smear factors" were used to adjust for retransformation of an error term with nonnormal distribution in the case of heteroscedasticity.[15] To determine whether the main regression results were sensitive to correlation between individuals with the same physician and to including health measures as control variables, the model was reestimated in two separate sensitivity analyses: using random physician intercepts and without including controls for SF-12 scores, comorbidities, and use of medications. All statistical analyses were conducted using Stata version 11 (StataCorp., College Station, TX).

RESULTS

Significant differences were found in several demographic characteristics, health indicators, and alcohol consumption behaviors between not-at-risk drinkers and at-risk drinkers (Table 1). At-risk drinkers were younger and more likely

Table 1. Characteristics of Not-at-Risk and At-Risk Older Drinkers (N = 2,779)

Characteristic	Not-at-Risk Drinkers, n = 2,151	At-Risk Drinkers, n = 628	*P*-Value
Demographic characteristic			
Age, mean ± SD	72.2 ± 7.9	70.5 ± 7.2	<.001
Female, %	55.7	31.4	<.001
Latino, %	5.7	6.1	.75
Race, %			
White	95.8	97.6	.06
African American	0.7	0.3	
Asian	1.9	1.6	
Native American	1.6	0.5	
Marital status, %			
Married	69.7	80.3	<.001
Widowed	14.7	9.1	
Divorced or separated	12.9	8.1	
Never married	2.7	2.6	
Education ≥ high school, %	86.6	96.7	.002
Household income, $, %			
<40,000	25.8	16.2	<.001
40,000–79,999	36.5	33.0	
≥80,000	37.7	50.8	
Home ownership, %	86.7	87.9	.42
Health indicator			
SF-36 physical component summary score, mean ± SD, (range 9.7–70.2)	48.2 ± 9.9	48.8 ± 9.6	.92
SF-36 mental component summary score, mean ± SD, (range 14.7–67.3)	45.2 ± 6.4	44.3 ± 6.5	.001
Any comorbidities, %	89.8	94.9	<.001
Any medication, %	70.4	80.4	<.001
Alcohol consumption			
Number of drinks per week, mean ± SD	3.1 ± 3.1	14.0 ± 8.6	<.001
Number of binges per week, mean ± SD	0.04 ± 1.0	1.1 ± 1.7	<.001
No days of driving after drinking in the past 12 months, %	100	66.7	<.001

SD = Standard Deviation.

to be male, married, have greater than high school education, and have household incomes of more than $80,000 per year ($P < .01$).

At-risk drinkers also had slightly lower SF-12 mental component summary scores. As expected, those in this group had greater comorbidity and were more likely to take medications. They also consumed more drinks per week and had a greater number of binge drinking episodes, and a higher percentage reported driving after drinking.

There were no statistically significant differences in outpatient healthcare expenditures during the 12 months after baseline between not-at-risk and at-risk drinkers (Table 2). Unadjusted 12-month mean healthcare expenditures were $1,333 ± 2,973 for at-risk drinkers and $1,417 ± 2,952 for not-at-risk drinkers. There were no differences after adjusting for sociodemographic and health characteristics; expected health expenditures were $1,328 (SE $88) for at-risk drinkers and $1,418 ($65) for not-at-risk drinkers. These results were not sensitive to including random physician intercepts or excluding controls for SF-12 summary scores, comorbidities, and medications.

Table 2. Unadjusted and Adjusted Mean Healthcare Expenditures for At-Risk and Not-at-Risk Older Drinkers

Drinkers	Unadjusted Mean ± SD, $	*P*-Value[a]	Adjusted Mean (SE), $[b]	*P*-Value
Not at risk (n = 2,151; reference)	1,417 ± 2,952		1,418 (65)	
At risk (n = 628)	1,333 ± 2,973	.50	1,328 (88)	.54

[a] Based on the Wilcoxon–Mann–Whitney test.

[b]Adjusted for age, sex, race and ethnicity, marital status, education, income, home ownership, physical and mental component scores of the Medical Outcomes Survey 12-item Short-Form Survey, any comorbidities, and any medications.

DISCUSSION

This study compared demographic characteristics, health indicators, and alcohol consumption behaviors of at-risk and not-at-risk drinkers. As was found previously,[6] at-risk drinkers were younger, more likely to be male, and more likely to be married and had higher education and incomes than not-at-risk drinkers. Because at-risk drinkers were identified as such because of their alcohol consumption, with or without comorbid conditions and medications, they consumed more alcohol than not-at-risk drinkers, and a higher proportion of them had comorbidities and took medications that may be hazardous when combined with alcohol.

Outpatient healthcare expenditures of not-at-risk and at-risk older drinkers were compared, and no statistically significant differences were observed. Prior studies have supported these results by finding that many younger adults engaging in risky drinking behaviors tend not to have high short-term medical care costs.[11] Many older adults who are at risk for substance abuse problems do not self-identify as having a substance abuse problem or seek services for substance abuse during their physician visits.[16] Older drinkers engaging in risky behaviors may be reluctant to seek preventive care to avoid embarrassment occasioned by advice from medical providers until they become ill and then begin to use health care.[9] A brief intervention targeting adults in primary care with a follow-up period of 48 months was able to reduce alcohol use, healthcare use, motor vehicle crashes, and associated costs,[17] but another study examining economic costs and benefits of a brief intervention for at-risk older drinkers with 24-month follow-up showed no economic benefit.[18] It may be that the shorter follow-up period and the smaller sample size in the second study[18] than in the first study[17] may have influenced the negative findings observed in the second study.

The current study has several limitations. First, as in most studies examining alcohol use, information on drinking frequency and quantity were based on self-reported data, so it is possible that some participants were misclassified, although existing evidence suggests that self-reported alcohol consumption tends to be reliable and valid.[17] Second, the study sample was more likely to be white, married, well-educated, and high income than the U.S. Census population aged 60 and older,[19] but this is the population most likely to drink alcohol.[20] Third, changes in drinking risk status that may have occurred over the 12-month period and influenced outpatient healthcare expenditures were not accounted for. Fourth, some outpatient services might occur off site, so the expenditures measure may be incomplete. Despite these limitations, this study is, to the knowledge of the authors, the first to explore the relationship between at-risk drinking and outpatient healthcare expenditures of older adults. Although an association was not found between at-risk drinking and short-term medical expenditures in older adults, the prevalence of at-risk drinking in this population combined with the continuing trends in the growth of the aging population in the United States and increases in healthcare expenditures suggest that other studies examining total costs and with longer-term follow-up periods are warranted to determine the effect of at-risk drinking in older adults on longer-term healthcare expenditures.

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Conflict of Interest: The editor in chief has reviewed the conflict of interest checklist provided by the authors and has determined that the authors have no financial or any other kind of personal conflicts with this paper.

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