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At-Risk Drinking and Outpatient Healthcare Expenditures among Older Adults

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Abstract

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Elements of Financial/ Personal Conflicts	Alison Moore		Haiyong Xu		Susan Ettner		Andrew Barnes		Tingjian Yan	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Employment or Affiliation		X		X		X		X		X
Grants/Funds		X		X		X		X		X
Honoraria		X		X		X		X		X
Speaker Forum		X		X		X		X		X
Consultant		X		X		X		X		X
Stocks		X		X		X		X		X
Royalties		X		X		X		X		X
Expert Testimony		X		X		X		X		X
Board Member		X		X		X		X		X
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Author Contributions:

Tingjian Yan: study concept and design, analysis and interpretation of data, preparation of manuscript

Haiyong Xu: analysis and interpretation of data, preparation of manuscript

Susan Ettner: study concept and design, acquisition of subjects and/or data, analysis and interpretation of data, preparation of manuscript

Andrew Barnes: analysis and interpretation of data, preparation of manuscript

Alison A. Moore, M.D., M.P.H.: study concept and design, analysis and interpretation of data, preparation of manuscript

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Objectives—To compare 12-month outpatient health care expenditures among at-risk and not at-risk drinkers aged 60 years and older.

Design—Secondary analysis of data from Project SHARE (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 years and older, who completed baseline survey data (N=2,779) and who did not receive the study intervention including 628 at-risk drinkers and 2,151 not at-risk drinkers.

Measurements—Comparisons among at-risk and not at-risk drinkers for baseline demographic characteristics, health indicators, alcohol consumption, and both adjusted and unadjusted outpatient health care expenditures incurred over 12 months after baseline.

Results—At-risk drinkers were younger, more often male, married and had higher education and incomes than not at-risk drinkers. The at-risk drinking group had unadjusted 12-month mean outpatient health care expenditures of \$1,333 (SD=\$2,973) compared to \$1,417 (SD=\$2,952) for the not-at-risk drinkers. There were no statistically significant differences in expenditures between groups with and without controlling for sociodemographic and health characteristics.

Conclusion—In this short-term study, we did not observe any adjusted differences in health care expenditures between at-risk and not at-risk older drinkers. Future study is warranted to determine the role of at-risk drinking in long-term health care expenditures in older adults.

Keywords

Alcohol use; at-risk drinking; health care expenditures

INTRODUCTION

Older adults are susceptible to alcohol-related consequences, due to age-related physiological changes that result in increased blood alcohol levels for a given dose of alcohol,¹ increased age-associated morbidity, and increased 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 either exceeds recommended drinking limits (e.g., more than 14 drinks per week for men aged less than 65 years, and more than 7 drinks per week for men aged 65 years and older and all women)³ and/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 years and older were at-risk drinkers and at-risk drinking has been associated with a 20% increase in mortality among older men.⁵ Existing research has examined economic costs of excessive alcohol consumption in the United States (\$223.5 billion in 2006) including health care costs (\$24.6 billion).⁸ Others have examined health care expenditures of those with alcohol abuse⁹ and among those with varying alcohol consumption patterns (e.g. former drinkers vs. non-drinkers and current drinkers).^{9–12} These studies suggest that former drinkers tended to have higher health care costs, compared to non-drinkers.^{9, 11} However, none have examined outpatient health care expenditures among older adults who are considered at-risk drinkers due to amount of alcohol consumed and/or comorbid conditions that may increase risk. Health care expenditures might be higher in this population of at-risk drinkers because of the interaction of alcohol with comorbidities than those in younger adults. Here we examine these expenditures among older at-risk drinkers

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

METHODS

Setting

This study used data from Project SHARE (Senior Health and Alcohol Risk Education), a cluster randomized trial testing the efficacy and examining the costs of an intervention to reduce at-risk drinking in adults aged 60 years 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

Information about the Project SHARE study has been described in detail elsewhere.⁶ Clinic information technology personnel identified all patients aged 60 years and older who were seeing participating physicians. Of the 3,529 persons who had participating physicians, who drank at least one alcoholic beverage in the prior three months, and who returned a baseline survey, 1,186 were identified as at-risk drinkers and 2,318 were identified 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. Among the at-risk drinkers, we included only those who were not in the intervention arm of the study, as we hypothesized that the intervention might influence health care expenditures. Twelve at-risk drinkers in the control arm and 167 not at-risk drinkers were eliminated from our analytic sample due to 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, we identified older adults at risk for harm from their alcohol consumption if they met criteria for at least one of the following three categories: 1) *unhealthy alcohol use behaviors* (e.g. exceeding a particular quantity and frequency of alcohol use, engaging in binge drinking (e.g., four or more drinks per occasion), driving after drinking within 2 hours of having 3 or more drinks, or having someone be concerned about individual's drinking); 2) *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 3) *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.

Health Care Expenditures

We estimated outpatient health care expenditures in the 12 months following the date each patient participant's baseline survey data were collected. These health care expenditures were estimated by linking the CPT (Current Procedural Terminology) codes from 2004–2008 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 health care expenditures and at-risk drinking, the following sociodemographic variables were controlled for in the statistical analyses: age, gender, race/ethnicity, education, marital status, annual household income and home ownership. Additionally, 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. We used chi-square tests for categorical variables and ANOVAs for continuous variables.

Due to the skewed distribution of health care expenditures, we used the Wilcoxon-Mann-Whitney test to compare the unadjusted mean differences between 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, hence facilitating efficiency of the estimates. The square root transformation was chosen over the log transformation because the former, but not the latter, can be applied to zero values. Subgroup-specific “smear factors” were used to adjust for the retransformation of an error term with non-normal distribution in the case of heteroscedasticity.¹⁵ To determine whether our main regression results were sensitive to correlation among patients with the same physician and to including health measures as control variables, we re-estimated our model in two separate sensitivity analyses: 1) using random physician intercepts; and 2) without including controls for SF-12 scores, comorbidities, and use of medications. All statistical analyses were conducted using STATA, version 11.¹⁶

RESULTS

Significant differences were found in several demographic characteristics, health indicators, and alcohol consumption behaviors among not-at-risk drinkers and at-risk drinkers. (Table 1) Compared to not at-risk drinkers (n=2,151), at-risk drinkers were younger and a higher percentage of them were male, married, had greater than higher school education, and had household incomes more than \$80,000 per year ($p<0.01$).

At-risk drinkers also had slightly lower SF-36 mental component summary scores. As expected, those in this group had a higher percentage of comorbidity and used medications. They also consumed a greater number of drinks per week, had a greater number of binge drinking episodes and a higher percentage reported driving after drinking.

There were no statistically significant differences in outpatient health care expenditures during the 12 months after baseline comparing not-at-risk and at-risk drinkers. Older drinkers in the at-risk drinking group had unadjusted 12-month mean health care expenditures of \$1,333 (Standard Deviation=\$2,973) compared to \$1,417 (Standard Deviation=\$2,952) for the not-at-risk drinkers. After adjusting for sociodemographic and health characteristics, there were also no differences; at-risk drinkers had expected health expenditures of \$1,328 (Standard Error=\$88) compared to \$1,418 (Standard Error=\$65) for the 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.

DISCUSSION

In this study, we compared demographic characteristics, health indicators, and alcohol consumption behaviors among at-risk and not at-risk drinkers. As was found previously by Barnes et al.⁶, we found that at-risk drinkers were younger, more often male, 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, compared to not at-risk drinkers, they consumed more alcohol and a higher proportion of them had comorbidities and took medications that may be hazardous when combined with alcohol.

We compared outpatient health care expenditures between not at-risk and at-risk older drinkers and observed no statistically significant differences. Prior studies support our results by finding that many non-elderly adults engaging in risky drinking behaviors tend not to have elevated 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.¹⁷ 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 utilize 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, health utilization, motor vehicle accidents and associated costs.¹⁸ But, another study examining economic costs and benefits of a brief intervention for at-risk drinking older adults with 24 month follow-up showed no economic benefit.¹⁹ It was suggested that, compared to the study done in the adult population,¹⁸ the negative findings observed in this study may have been influenced by the shorter follow up period and the smaller sample size.¹⁹

Our study has several limitations. First, as in most studies examining alcohol use, information on drinking frequency and quantity were based on patient self-reported data. Therefore, it is possible that some patients were misclassified. However, existing evidence suggests that patient self-reported alcohol consumption tends to be reliable and valid.¹⁸ Second, our study sample was more likely to be white, married, well-educated and high income, compared to the U.S. Census population over 60 years old,²⁰ but this is the population most likely to drink alcohol.²¹ Third, we did not account for any changes in drinking risk status that may have occurred over the 12 month period and influenced outpatient health care expenditures. Fourth, some outpatient services might occur off site. Therefore, our expenditures measure may be incomplete. Despite these limitations, this study is, to our knowledge, the first to explore the relationship between at-risk drinking and outpatient health care expenditures among older adults. Although we did not find any association between at-risk drinking and short-term medical expenditures among 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 health care expenditures suggest that other studies, examining total costs, and with longer term follow-up periods are warranted to determine the impact of at-risk drinking among older adults on longer-term health care expenditures.

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Table 1

Characteristics of Not at-risk and At-risk older drinkers (n=2,779)

Characteristics	Not at-risk drinkers (n=2,151)	At-risk drinkers (n=628)	P
Demographic Characteristics			
Age in years, mean (SD)	72.2 (7.9)	70.5 (7.2)	<0.001
Gender, %			
Female	55.7	31.4	<0.001
Latino Ethnicity, %	5.7	6.1	0.75
Race, %			
White	95.8	97.6	0.06
African American	0.7	0.3	
Asian	1.9	1.6	
Native American	1.6	0.5	
Marital Status, %			
Married	69.7	80.3	<0.001
Widowed	14.7	9.1	
Divorced or separated	12.9	8.1	
Never married	2.7	2.6	
Education, %			
Greater than high school	86.6	96.7	0.002
Household income, %			
Less than \$39,000	25.8	16.2	<0.001
\$40,000–\$79,999	36.5	33.0	
\$80,000 or more	37.7	50.8	
Home ownership, %			
Yes	86.7	87.9	0.42
Health indicators			
SF-36 physical component summary score, mean (SD), range: 9.7 to 70.2	48.2(9.9)	48.8 (9.6)	0.92
SF-36 mental component summary score, mean (SD), range: 14.7 to 67.3	45.2 (6.4)	44.3 (6.5)	0.001
Any comorbidities, %	89.8	94.9	<0.001
Any medication, %	70.4	80.4	<0.001
Alcohol Consumption			
Number of drinks per week, mean (SD)	3.1 (3.1)	14.0 (8.6)	<0.001
Number of binges per week, mean (SD)	0.04 (1.0)	1.1 (1.7)	<0.001
No days of driving after drinking in the past 12 months, %	100	66.7	<0.001

Table 2

Unadjusted and Adjusted Mean Health Care Expenditures for At-risk and Not at-Risk Older Drinkers

	Unadjusted Mean (SD)	<i>p</i> ^a	Adjusted Mean ^b (SE)	
Not at-risk drinkers (n=2151) (reference)	\$1417 (\$2952)	---	\$1418 (\$65)	---
At-risk drinkers (n=628)	\$1333 (\$2973)	0.50	\$1328 (\$88)	0.54

^a Based on the Wilcoxon-Mann-Whitney test.

^b Adjusted for age, gender, race/ethnicity, marital status, education, income, home ownership, physical component score, mental component score, any comorbidities, and any mediations.