Published in final edited form as:

Traffic Inj Prev. 2015 February 17; 16(2): 104–108. doi:10.1080/15389588.2014.926340.

Characteristics of older at-risk drinkers who drive after drinking and those who do not drive after drinking

Maija B. Sanna, Alia T. Tuqan, Jeff S. Goldsmith, Malena S. Law, Karina D. Ramirez, Diana H. Liao, and Alison A. Moore

Abstract

Objective—To describe and compare characteristics of older adults who drive after drinking and those who do not, whether an intervention addressing at-risk drinking reduces risk among those reporting driving after drinking, and reasons reported for driving after drinking.

Methods—Secondary data analysis of a randomized trial testing the efficacy of a multifaceted intervention to reduce at-risk drinking among adults with a mean age of 68 years in primary care (N=631).

Results—Almost a quarter of at-risk drinkers reported driving after drinking (N=154). Compared to those who did not drive after drinking, those who did were more likely to be younger, male and working. They consumed a higher average number of drinks per week, had more reasons they were considered at-risk drinkers, and were more likely to meet at-risk drinking criteria due to amount of drinking and binge drinking. Those driving after drinking at baseline reduced the frequency of this behavior at 3- and 12-months and there were no statistically significant differences in the proportions of persons still engaging in driving after drinking among those who were assigned to intervention or control groups. Reasons for driving after drinking included not thinking it was a problem and having to get home.

Conclusions—Driving after drinking is common in this population of older, at-risk drinkers recruited in primary care settings, and, like younger adults, men and those reporting binge drinking are more likely to engage in this behavior. Given this behavior is dangerous and the population of older adults is fast growing, interventions addressing driving after drinking are needed.

Keywords

alcohol; old drivers; elderly; interventions

Introduction

In 2011 the first of the Baby Boomer generation turned 65. It is estimated that by 2020 there will be 38 million drivers aged 70 and over in the United States [1]. In addition, the amount

of miles driven by the older Baby Boomer population is projected to more than double compared to the prior population of older drivers [2].

Approximately half of all seniors age 65 and over living in the community report being current drinkers, with 2–4% of adults 65 and over meeting criteria for alcohol abuse and dependence [3–4]. This number is expected to rise as the Baby Boomer population has higher rates of heavy alcohol use and illicit drug use than prior generations [5]. In 2012, 21% of drivers involved in fatal crashes had a blood alcohol concentration (BAC) of 0.08 or higher [6]. Of these drivers, 14% were aged 55–64, 9% were aged 65–74, and 5% were aged 75 and over [6]. Of drivers aged 65 and over involved in single-vehicle fatalities, 13% had a BAC >0; 3.7% had a BAC between 0–0.08 and 9.3% had a BAC of 0.08 or higher [7]. One study found although alcohol was less likely to be a factor in traffic collisions involving older adults, in crashes where alcohol was involved, older crash-responsible drivers were more likely to have higher BACs compared to younger drivers who were at-fault [8].

Age-related decline in visual processing speed and divided attention have been linked to a greater crash risk in older drivers [9]. Prior studies found that driver death rates conform to a U shaped curve with highest death rates in youth and the elderly [10, 11]. When in motor vehicle collisions (MVC), older drivers have higher rates of injuries and fatalities compared to younger drivers [10]. While underlying fragility most certainly influences this increased number of fatalities [11], such increased risk may be partially explained by higher comorbidity and medication use in the older population. For example, it has been shown that MVC risk increases by 50% within the first week of being prescribed a benzodiazepine medication [12]. Prior studies have shown that 82% of adults aged 65 and over have one or more chronic conditions [13], and over 90% of older adults take medications [14]. Alcohol abuse and dependence, dementia, epilepsy, schizophrenia and obstructive sleep apnea are associated with a moderately high risk of collision [15]. Increased risk of collision is also seen with cerebrovascular disease, cardiovascular disease, traumatic brain injury, depression, diabetes, vision disorders, and musculoskeletal disorders [15].

While drinking and driving is hazardous at any age, physiologic changes that increase alcohol's effects combined with disease, medication, and age-related changes in older adults' driving skills make any alcohol consumption prior to driving more risky [4, 16, 17]. Although many older adults compensate for age, medication, and disease-related changes by driving less at night and reducing the number of miles driven, driving after drinking is still not uncommon. In fact, one study found that among binge drinkers (defined as consuming five or more drinks on at least one occasion in the past 30 days), 14.5 % of persons aged 55 years and older drove during or within two hours of binge drinking. [17] Compared to binge drinkers aged 18 to 34 years, those aged 55 years and older were more than twice as likely to drive after binge drinking. [17]. Between 1999 and 2006, 14% of alcohol-impaired driver deaths occurred in persons 65 years and over [18].

Prior studies have shown that brief behavioral counseling interventions provided by primary care physicians have reduced alcohol misuse in adults [19, 20] and that these interventions were also effective for the older adult population [21–24]. In addition, alcohol screening and counseling in primary care has been shown to be both cost effective from the health system

perspective and cost saving from the societal perspective [25]. Alcohol related brief interventions have been utilized and tested in other settings as well. For example, a brief intervention for alcohol disorders in DUI trauma center admissions has been shown to reduce subsequent DUI arrest in the following three years [26]. Other studies have shown reduction in risk of injury or drinking related consequences when brief interventions are utilized in trauma centers and emergency rooms for alcohol related injuries [27–29].

To our knowledge, the only prior study evaluating the effectiveness of primary care counseling to reduce drinking and driving practices involved retrospective data from the Cutting Back SBI study for at-risk drinkers [30]. This study showed reductions in driving-while-intoxicated citations among intervention participants, however, it did not focus on older adults. Because older adults are seen frequently in the primary care setting and often have trusted relationships with their physicians, primary care-based interventions may be an effective intervention method to reduce drinking and driving in this population.

We utilized data from participants in the Healthy Living As You Age (HLAYA) Study, a randomized trial designed to evaluate the efficacy of a primary care-based intervention to reduce at-risk drinking, including driving after drinking, in older adults [23]. In this paper, we compare demographic, health-related characteristics and types of baseline risks among those participants who drink and drive compared to those who do not drink and drive and describe reasons people report driving after drinking. We also evaluate if a primary care based intervention to reduce at-risk drinking in older adults reduces drinking after driving at 12-months in participants endorsing this behavior at baseline.

Methods

Description of study

This is a secondary analysis of data from the randomized controlled trial, the Healthy Living as You Age (HLAYA) study [23]. The HLAYA study tested the efficacy of a multifaceted intervention to reduce at-risk drinking among older adults in primary care and was approved by the Institutional Review Boards from the University of California at Los Angeles and Kaiser Permanente Southern California. Participants were recruited from three health care organizations located in Southern California. Participants aged 55 and older were identified as at-risk drinkers using the Co-morbidity Alcohol Risk Evaluation Tool (CARET) [23–24]. The CARET is a measure to identify at-risk drinking older adults. It includes questions assessing seven categories of risk: 1) quantity and frequency of drinking, 2) binge drinking (four or more drinks on an occasion), 3) driving within 2 hours of drinking three or more drinks, 4) others being concerned about the respondent's drinking, and the interaction of alcohol with 5) medications, 6) symptoms and 7) medical and psychiatric conditions. Using items on the CARET, participants were assigned risk scores (1–7) determined by the seven risk categories.

Participants identified as at-risk on the CARET were eligible for study participation and randomly assigned to intervention or control groups (n=631). The control group received a booklet that contained information on general health behaviors including alcohol use. The intervention group received 1) a booklet that contained information specifically on alcohol

and aging, 2) a personalized risk report based on their CARET responses, 3) advice from their physicians to reduce risks, and 4) up to 3 calls from a health educator at 2, 4, and 8 weeks after the baseline visit to provide education and feedback regarding risky drinking behaviors. Both groups completed baseline demographic and health-related questionnaires, and completed the CARET again at 3- and 12- months after the baseline. Drinking and driving was defined as driving within 2 hours of having 3 or more drinks within the past 12 months (baseline CARET), within the past 3 months (3 month CARET), and within the past 9 months (12 month CARET). Participants who reported drinking and driving on any of the surveys were asked at the 12 month interview to identify reasons for driving after drinking.

Data Analysis

Baseline demographic, health-related and drinking characteristics and types of baseline risks for participants who reported driving after drinking (n=154) were compared to those identified as at-risk drinkers for other reasons (n=477). Of the 154 participants who reported drinking and driving, 73 were randomized to the intervention group and 81 were randomized to the control group (p value = 0.6222); 140 remained at 3 months (65 intervention and 75 control) and 126 remained at 12 months (51 intervention and 75 control). Chi-square tests were used to compare proportions of baseline at-risk drinkers who reported driving after drinking at 3- and 12- months in both intervention and control groups. Respondents who reported driving after drinking at the 12 month survey were asked why they did so. They were offered multiple choice responses and asked to choose one or more of them. The choices were: 1) I did not think it was a problem, 2) No idea and 3) Other. Numbers and percentages of reasons for driving after drinking were categorized for persons reporting driving after drinking at the 12 month survey.

Results

Baseline sample characteristics

Twenty-four percent of at-risk drinkers enrolled in the Healthy Living as You Age study reported driving after drinking. Compared to at-risk drinkers who did not report driving after drinking, at-risk drinkers who drive after drinking were more likely to be younger, male, and to be working (Table 1). They consumed, on average, more drinks per week, and exercised less. There were no statistically significant differences between groups in education, marital status, race, tobacco or seatbelt use.

Participants who reported driving after drinking had a higher baseline mean number of risks as defined by the CARET at enrollment compared to participants who did not report driving after drinking (4.0 vs. 2.6) (Table 2). These two groups also had some differences in types of risk. Among the CARET's six categories of risk, those who drink and drive were more likely to meet at-risk criteria due to amount of drinking and binge drinking, and less likely due to use of alcohol with medications. No other differences in types of risk were observed between those who drove after drinking and those who did not.

Outcomes

Of the 154 participants who reported driving after drinking at baseline, driving after drinking declined in both the intervention (n=19/65, 29%) and control (n=29/75, 39%) groups at 3-months, and intervention (n=16/51, 31%) and control (n=29/75 39%) groups at 12-months. There were no statistically significant differences between groups.

When asked at the 12 month interview, the participants who had endorsed driving after drinking at that time (n=96) reported doing so because they did not think it was a problem (n=66, 69%), or they had to get home (n=35, 37%), or they had no idea why they drove after drinking (n=12).

Discussion

In a population of older at-risk drinkers, 24% reported driving after drinking, most of who did so because they did not think it was a problem or they had to get home. Older, at-risk drinkers who drink and drive are more likely to be male, younger, working, exercise less often, and drink more than older at-risk drinkers who do not drink and drive. The mean number of risks and prevalence of binge drinking was higher in at-risk drinkers who drink and drive than those who do not drink and drive.

Binge drinking and alcohol-impaired driving have been shown to have a strong association in multiple studies [31]. Quinlan et al reported that between 1993–2002, over 80% of the total alcohol-impaired driving episodes were reported in persons who also reported binge drinking [32]. Similar rates were seen in the data from the 2010 behavioral risk factor surveillance system, which showed 85% of impaired driving episodes were reported by those who also reported binge drinking [33].

Interventions to address driving under the influence of alcohol in the general population were reviewed by Howat et al [34]. More effective interventions include server litigation, sobriety checkpoints, random breath testing, reducing availability, lowering the legal BAC limit, minimal legal drinking age laws, government laws/regulations, and media promotions. There is moderate evidence for strategies that restrict advertising and promotion of counter advertising and insufficient evidence for school drug and alcohol education programs, safety warning labels, community mobilization efforts, and passive server training programs. The authors conclude that the most effective means of changing impaired driving behavior is through a multifaceted approach including educational, organizational, economic, and political actions.

In this study, for those reporting driving after drinking, physician advice coupled with health educator counseling, a personalized report, and an information booklet on alcohol use, did not result in a significant reduction in drinking and driving compared to those who got a general booklet on healthy behaviors. However, the HLAYA study was not powered to observe differences in this subsample which may account for the negative finding.

Prior studies have shown that brief interventions in the primary care setting can especially reduce alcohol consumption in men [35]. Given that men are more likely to engage in

drinking and driving behaviors [33], brief interventions in primary care clinics specifically targeting this population could reduce rates of drinking and driving.

As we observed for alcohol consumption in the HLAYA study main paper [23], we observed large and sustained reductions in drinking and driving seen in both the control (approximately 60% reduction at 3- and 12- months) and intervention (approximately 70% reduction at 3- and 12- months) groups. Factors that may have contributed to this finding include regression towards the mean and assessment effects [23, 36, 37]. In addition, social desirability bias likely also contributed to reductions in reported drinking and driving seen in both groups as is often seen in studies that involve illegal activities that have negative connotations or social stigma [31, 33, 34].

Other study limitations include the sample size as this study was not powered to detect a difference in rates of driving after drinking between intervention and control groups and that it relies on self report of driving after drinking among participants.

Despite reductions in reported drinking and driving in both arms, most participants did not feel that drinking and driving was a problem. There may be generational attitudes towards drinking and driving in this population of at-risk drinkers that make interventions such as this less effective [38]. Drinking and driving habits may have been well-established before the more recent social pressure and stricter law enforcement was in effect.

In summary, our data add to the literature on driving after drinking among older adults. More work addressing this common and dangerous practice is needed among the booming population of older drivers.

Acknowledgments

Funding support: This study was supported by R01 AA013937, K23 AA00270, and K24AA15957 (awarded to Dr. Moore) from the National Institute of Alcohol Abuse and Alcoholism, P30AG10415 and P30AG028748 from the National Institute of Aging.

Additional Contributions: We gratefully acknowledge the patients and clinicians at Desert Oasis Healthcare (DOHC), Kaiser Permanente Southern California (KPSC)-Panorama City and Woodland Hills, and UCLA Healthcare without whom this study could not have been completed.

References

1. Report of the Census. U.S. Bureau of the Census; Washington D.C.: 2000. <http://www.census.gov/prod/www/decennial.html>
2. Dobbs BM. Aging baby boomers – a blessing or challenge for driver licensing authorities. *Traffic Inj Prev*. Aug; 2008 9(4):379–86. [PubMed: 18696395]
3. Moore AA, Endo JO, Carter MK. Is there a relationship between excessive drinking and functional impairment in older persons? *J Am Geriatr Soc*. Jan; 2003 51(1):44–9. [PubMed: 12534844]
4. Moore AA, Morton SC, Beck JC, et al. A new paradigm for alcohol use in older persons. *Med Care*. Feb; 1999 37(2):165–79. [PubMed: 10024121]
5. Gfroerer J, Penne M, Pemberton M, Folsom R. Substance abuse treatment need among older adults in 2020: the impact of the aging baby-boom cohort. *Drug Alcohol Depend*. Mar; 2003 69(2):127–35. [PubMed: 12609694]
6. Traffic Safety Facts, 2012 Data. U.S. Department of Transportation; Washington D.C.: 2013. <http://www-nrd.nhtsa.dot.gov/pubs/811870.pdf>

7. Romano E, Pollini RA. Patterns of drug use in fatal crashes. *Addiction*. Aug; 2013 108(8):1428–38. [PubMed: 23600629]
8. McGwin G Jr, Brown DB. Characteristics of traffic crashes among young, middle-aged, and older drivers. *Accid Anal Prev*. May; 1999 31(3):181–98. [PubMed: 10196595]
9. Wood JM, Anstey KJ, Lacherez PF, Kerr GK, Mallon K, Lord SR. The on-road difficulties of older drivers and their relationship with self-reported motor vehicle crashes. *J Am Geriatr Soc*. Nov; 2009 57(11):2062–9. [PubMed: 19793153]
10. Tefft BC. Risks older drivers pose to themselves and to other road users. *J Safety Res*. 2008; 39(6): 577–82. [PubMed: 19064042]
11. Li G, Braver ER, Chen LH. Fragility versus excessive crash involvement as determinants of high death rates per vehicle-mile of travel among older drivers. *Accid Anal Prev*. Mar; 2003 35(2):227–35. [PubMed: 12504143]
12. Hemmelgarn B, Suissa S, Huang A, Boivin JF, Pinard G. Benzodiazepine use and the risk of motor vehicle crash in the elderly. *JAMA*. Jul; 1997 278(1):27–31. [PubMed: 9207334]
13. Wolff JL, Starfield B, Anderson G. Prevalence, expenditures, and complications of multiple chronic conditions in the elderly. *Arch Intern Med*. Nov; 2002 162(20):2269–76. [PubMed: 12418941]
14. MEPS AHRQ. Medical Expenditure Panel survey household component data. U.S. Department of Health & Human Services; Rockville, MD: 2006. Available at: http://meps.ahrq.gov/mepsweb/survey_comp/household.jsp
15. Marshall SC. The role of reduced fitness to drive due to medical impairments in explaining crashes involving older drivers. *Traffic Inj Prev*. Aug; 2008 9(4):291–8. [PubMed: 18696384]
16. Moore AA, Giuli L, Gould R, et al. Alcohol use, comorbidity, and mortality. *J Am Geriatr Soc*. May; 2006 54(5):757–62. [PubMed: 16696740]
17. Naimi TS, Nelson DE, Brewer RD. Driving after binge drinking. *Am J Prev Med*. Oct; 2009 37(4): 314–20. [PubMed: 19765503]
18. Roudsari B, Ramisetty-Mikler S, Rodriguez LA. Ethnicity, age, and trends in alcohol-related driver fatalities in the United States. *Traffic Inj Prev*. Oct; 2009 10(5):410–4. [PubMed: 19746303]
19. Jonas DE, Garbutt JC, Amick HR, et al. Behavioral counseling after screening for alcohol misuse in primary care: A systematic review and meta-analysis for the U.S. Preventive Services Task Force. *Ann Intern Med*. Nov 6; 2012 157(9):645–54. [PubMed: 23007881]
20. Bien TH, Miller WR, Tonigan JS. Brief interventions for alcohol problems: a review. *Addiction*. Mar; 1993 88(3):315–35. [PubMed: 8461850]
21. Fleming MF, Manwell LB, Barry KL, Adams W, Stauffacher EA. Brief physician advice for alcohol problems in older adults: a randomized community-based trial. *J Fam Pract*. May; 1999 48(5):378–84. [PubMed: 10334615]
22. Fink A, Elliott MN, Tsai M, Beck JC, et al. An evaluation of an intervention to assist primary care physicians in screening and educating older patients who use alcohol. *J Am Geriatr Soc*. Nov; 2005 53(11):1937–43. [PubMed: 16274375]
23. Moore AA, Blow FC, Hoffing M, et al. Primary care-based intervention to reduce at-risk drinking in older adults: a randomized controlled trial. *Addiction*. Jan; 2011 106(1):111–20. [PubMed: 21143686]
24. Ettner SL, Xu H, Duru OK, Ang A, et al. The effect of an educational intervention on alcohol consumption, at-risk drinking and health care utilization in older adults: the Project SHARE study. *J Stud Alcohol Drugs*. May; 2014 75(3):447–57. [PubMed: 24766757]
25. Solberg LI, Maciosek MV, Edwards NM. Primary care intervention to reduce alcohol misuse ranking its health impact and cost effectiveness. *Am J Prev Med*. Feb; 2008 34(2):143–152. [PubMed: 18201645]
26. Schermer CR, Moyers TB, Miller WR, Bloomfield LA. Trauma center brief interventions for alcohol disorders decrease subsequent driving under the influence arrests. *J Trauma*. Jan; 2006 60(1):29–34. [PubMed: 16456433]
27. Soderstrom CA, DiClemente CC, Dischinger PC, Hebel JR, McDuff DR, Auman KM, Kufera JA. A controlled trial of brief intervention versus brief advice for at-risk drinking trauma center patients. *J Trauma*. May; 2007 62(5):1102–11. discussion 1111–2. [PubMed: 17495708]

28. Gentilello LM, Rivara FP, Donovan DM, Jurkovich GJ, Daranciang E, Dunn CW, Villaveces A, Copass M, Ries RR. Alcohol interventions in a trauma center as a means of reducing the risk of injury recurrence. *Ann Surg.* Oct; 1999 230(4):473–80. discussion 480–3. [PubMed: 10522717]
29. D'Onofrio G, Fiellin DA, Pantalon MV, et al. A brief intervention reduces hazardous and harmful drinking in emergency department patients. *Ann Emerg Med.* Aug; 2012 60(2):181–92. [PubMed: 22459448]
30. Davis HT, Beaton SJ, Von Worley A, Parson SW, Gunter MJ. The effectiveness of screening and brief intervention on reducing driving while intoxicated citations. *Popul Health Manag.* Feb; 2012 15(1):52–7. [PubMed: 22204312]
31. Flowers NT, Naimi TS, Brewer RD, Elder RW, Shults RA, Jiles R. Patterns of alcohol consumption and alcohol-impaired driving in the United States. *Alcohol Clin Exp Res.* Apr; 2008 32(4):639–44. [PubMed: 18341648]
32. Quinlan KP, Brewer RD, Siegel P, et al. Alcohol-impaired driving among U.S. adults, 1993–2002. *Am J Prev Med.* 2005; 28(4):346–50. [PubMed: 15831339]
33. Centers for Disease Control and Prevention. Vital signs: alcohol-impaired driving among adults – United States, 2010. *MMWR Morb Mortal Wkly Rep.* Oct; 2011 60(39):1351–6. [PubMed: 21976118]
34. Howat P, Sleet D, Elder R, Maycock B. Preventing alcohol-related traffic injury: a health promotion approach. *Traffic Inj Prev.* Sep; 2004 5(3):208–19. [PubMed: 15276921]
35. Kaner EF, Dickinson HO, Beyer F, et al. The effectiveness of brief alcohol interventions in primary care setting: a systematic review. *Drug Alcohol Rev.* May; 2009 28(3):301–23. [PubMed: 19489992]
36. Bernstein JA, Bernstein E, Heeren TC. Mechanisms of change in control group drinking in clinical trials of brief alcohol intervention: implications for bias toward the null. *Drug Alcohol Rev.* Sep; 2010 29(5):498–507. [PubMed: 20887573]
37. Kypri K, Langley JD, Saunders JB, Cashell-Smith ML. Assessment may conceal therapeutic benefit: findings from a randomized controlled trial for hazardous drinking. *Addiction.* Jan; 2007 102(1):62–70. [PubMed: 17207124]
38. Levenson MR, Aldwin CM, Sprio A 3rd. Age, cohort and period effects on alcohol consumption and problem drinking: findings from the Normative Aging Study. *J Stud Alcohol.* Nov; 1998 59(6):712–22. [PubMed: 9811093]

Table 1

Participant Baseline characteristics

Characteristics	Risky drinkers who drink and drive (N= 154) 24%	Risky drinkers who do not drink and drive (N= 477) 76%	P Value
Age, mean (SD)	67.3 (6.9)	68.8 (6.8)	0.02
Male gender	141 (92)	307 (64)	<0.0001
Education: % HS	148 (96)	439 (93)	0.15
Marital Status: % Married	69 (45)	242 (51)	0.19
Employment: % Working	55 (36)	111 (23)	<0.01
Race: % White	132 (86)	419 (88)	0.75
Health: % Excellent-Good	142 (93)	419 (88)	0.09
Average # of Drinks per Week (SD)	17.0 (7.8)	14.6 (7.0)	<0.01
Seatbelts: % Use Seatbelts	148 (96)	468 (98)	0.15
Smoke: % Smoke Tobacco	30 (19)	69 (14)	0.14
Exercise: % Exercise 3–4 d/wk	100 (65)	357 (75)	0.02
Fruits and Vegetables: % Eat 4–5 servings/day	30 (19)	129 (27)	0.06

Table 2

Participant Baseline Risks from the CARET

Risks	DO drink and drive (N = 154)	DO NOT drink and drive (N = 477)	P Value
Mean number of risks (SD)	4.0 (1.8)	2.6 (1.5)	<0.0001
% Alcohol use alone	92 (60)	203 (43)	<0.01
% Alcohol use with disease	77 (50)	238 (50)	0.98
% Alcohol use with symptoms	98 (64)	280 (59)	0.28
% Alcohol use with medications	103 (67)	359 (75)	0.04
% Drinking 4+ drinks at once	60 (39)	89 (19)	<0.0001
% Others concerned about drinking	27 (18)	79 (17)	0.78