

ORIGINAL ARTICLE

Drinking behaviors in young adults: the potential role of designated driver and safe ride home programs

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Objectives: To determine the drinking and driving habits reported in people aged 21–34 years.

Design: Random digit dialing survey.

Setting: Seattle and Spokane, Washington; Portland, Oregon.

Participants: 917 individuals aged 21–34 years, who had a valid driver's license, who had consumed at least one alcoholic drink in the last year and who lived in Seattle, Spokane or Portland.

Outcome measures: Driving after drinking, use of a designated driver and serving as a designated driver.

Results: 62% drank alcohol at least weekly, and 31% binged at least once per month in the last year. 21% drove after drinking too much in the last month. Two-thirds of individuals reported being a designated driver at least once in the last year, and in most instances, this had been decided before the group went out for the evening. Over three-quarters of individuals reported that they drank less than they usually do the last time they were a designated driver. When using a designated driver, almost half of the individuals reported drinking more on that occasion than usual, with approximately half of those having at least three more drinks than usual.

Conclusions: These results point to the need for interventions to combat the problem of drunk driving and prevent its associated morbidity and mortality. Rigorous evaluation of the effect of designated driver and safe ride home programs are needed.

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Over 60 000 people die due to harmful drinking each year in the US. About half of these deaths are due to alcohol-related injuries, and occur most commonly in motor vehicle crashes.¹ The highest proportion of intoxication among fatally injured drivers is in those aged 21–34 years.² The problem of alcohol-impaired driving is a worldwide one and may be increasing in some countries such as Sweden.³

Designated driver and safe ride home programs are the two measures that have been proposed to decrease the toll due to alcohol-impaired driving.^{4–5} Designated driver programs require individuals to plan who will drive whom after drinking so that, ideally, the designated driver does not consume any alcohol. Safe ride home programs provide alternative means of transportation such as taxis, vans and limousines, or provide a different driver to drive the individual's car home. Designated driver programs have been widely promoted⁶ and are popular among various groups.⁷ Safe ride home programs are used less extensively,⁸ and often only for special holidays associated with drinking.⁹

However, concerns have been raised that designated drivers nevertheless still drink before driving,^{10–11} and that the availability of designated drivers increases the amount of alcohol consumed by those not driving.^{12–13} Similar concerns have been expressed about those who use safe ride home programs.¹⁴ These prior studies are based on selected populations, such as college students or bar patrons, and may not be representative of the general population of people in the 21–34-years of age group. We therefore conducted a random digit dialing (RDD) survey to determine the reported drinking and driving habits in the people of this age group.

METHODS

The Human Subjects Division of the University of Washington, Seattle, Washington DC, USA, approved the survey procedures. A professional research survey firm conducted the survey in March 2006. Study respondents were individuals aged

21–34 years, who reported having a valid driver's license, who had consumed at least one alcoholic drink in the last year (half an ounce of pure alcohol—for example, a 12-ounce can or glass of beer or cooler, a 5-ounce glass of wine, or a drink containing 1 shot of liquor), and lived in Seattle, Spokane or Portland. To reach the targeted audience of 21–34 year olds, the sample was drawn and administered using a RDD-listed sample of households consisting of adults aged 21–34 years in the three metropolitan areas. This was enhanced by an additional sample of 21–24-year olds using an age-targeted listed sample.

Telephone surveys were conducted using computer-assisted telephone interviewing technology. Both landline and cell phones were included in the RDD sample, stratified by metropolitan area to obtain approximately 300 completed interviews from each area. In addition to stratifying by city, the sample was further stratified into six gender- and age-cohorts, based on ages 21–24, 25–29 and 30–34 years. The overall response rate for the survey was 55%. Of the 917 interviews, 877 were on landlines, and 40 were on cell phones.

The survey was based on prior studies of designated driver and safe ride home programs.^{9–10–12–17} Questions on quantity and frequency of alcohol use were based on questions from the National Epidemiologic Survey of Alcohol and Related Conditions of the National Institute on Alcohol Abuse and Alcoholism, Bethesda, Maryland, USA.¹⁸ The survey was pretested among individuals in the target age group, revised and then pretested by the survey firm using RDD respondents.

Results were similar for respondents from the three cities and were therefore combined for analysis. Multivariate analyses were conducted to determine independent risk factors for having driven after drinking too much, using a designated driver and serving as a designated driver. Variables were retained in the models if they changed the relative risk estimates by $\geq 10\%$.

Abbreviation: RDD, random digit dialing

Table 1 Characteristics of the study population (n=917)

	Study sample (%)	Population (%)
Age (years)		
21–24	25.8	25.1
25–39	37.7	37.4
30–34	36.4	37.5
Gender		
Male	52	51
Female	48	49
Location		
Seattle	34.2	—
Spokane	33.0	—
Portland	32.7	—
Income (US\$)		
<15 000	7.5	14.2
15 000–30 000	14.7	20.1
30 000–50 000	21.8	23.4
50 000–75 000	23.4	17.0
>75 000	29.2	25.3
Education		
High school/GED or less	11	28
Some college/vocational/technical school	33	32
College graduate	32	30
Graduate school/professional degree	24	10
Phone		
Landline	95	—
Cell	5	—

GED, General Equivalency Diploma.

Table 2 Alcohol consumption practices of 917 respondents

	%
Usual frequency of drinking alcohol in last 12 months	
5–7 times per week	10
3–4 times per week	19
1–2 times per week	33
2–3 times per month	17
≤ 1 time per month	21
Number of drinks on typical drinking day in the last 12 months	
≥5	20
3–4	27
2	30
1	23
Number of times binge drinking* in the last 12 months	
≥2 times per week	10
1 time per week	4
1–3 times per month	17
<1 time per month	33
None	35
Location of last time drinking with others	
Own home	27
Other's home	18
Bar, restaurant or club	50
Other	5
Number of times driven after drinking too much in the last month	
0	79
1–2	16
≥3	5

*Four drinks for women and five drinks for men within a 2 h period.

RESULTS

The respondents were evenly divided by gender and had a mean age of 28 years (table 1). The majority of respondents had graduated college and had a median household income of US\$54 612 (£27958, €41 057). Our sample was similar in age and gender to the population of 21–34-year olds in the three cities surveyed, but had fewer individuals in the lowest income and education strata.

Most respondents drank alcohol at least weekly, and 31% binged at least once per month in the last year (table 2). Half of the respondents reported that the last occasion of drinking with friends had been at a bar, club or restaurant. One in five reported that they had driven after drinking too much in the last month.

Two-thirds of individuals reported being a designated driver at least once in the last year, and in most instances this had been decided before the group went out for the evening (table 3). The most common reason cited for being a designated driver was that it was their turn. Many serving as designated drivers were motivated by safety reasons as either no one else volunteered, another driver was drunk or they felt they needed to do so to get home safely. More than one-third of individuals reported that they had some alcohol to drink the last time they served as a designated driver; however, in only 3% of cases was it more than two drinks. Over three-quarters of individuals reported that they drank less than they usually did the last time

Table 3 Designated driver and safe ride home practices of the 917 respondents

	%
Been a designated driver in the last 12 months	66
Decided to be designated driver before went out*	84
Reasons for being a designated driver last time*	
My turn	32
No one else would do it	11
To get home safely	8
Friend was drunk	4
Do not drink much/not drinking that night	19
Couldn't drink because was pregnant	3
Volunteered	10
Other	13
Number of drinks consumed last time were designated driver*	
None	61
1	25
2	11
≥3	3
Amount drunk last time served as designated driver*	
Less than usual	77
About same as usual	21
More than usual	1
Been with someone else who served as designated driver in the last 12 months†	71
Did the designated driver drink†	
Yes	40
Did you drink more on that occasion†	
Yes	44
Number of drinks more than usually drink†	
1	11
2	37
3	20
4–5	19
≥6	13
Ever taken a taxi home after a night of drinking	34

*Among those who had been designated driver in last 12 months.

†Among those out with someone else who was designated driver.

Table 4 Adjusted RRs of driven after drinking too much, serving as or using a designated driver*

	Driven after drinking too much	Served as a designated driver	Used a designated driver
	RR (95% CI)	RR (95% CI)	RR (95% CI)
Age (years)			
21–24		1.12 (1.00 to 1.26)	
25–29		1.09 (0.93 to 1.26)	
30–34		1	
Gender			
Male		1	
Female		1.18 (1.15 to 1.21)	
Income (US\$)			
<15 000	1.12 (0.71 to 1.78)	1.10 (0.86 to 1.41)	
15 000–30 000	1.16 (0.70 to 1.90)	0.90 (0.83 to 0.98)	
30 000–50 000	1.24 (1.06 to 1.46)	0.96 (0.83 to 1.11)	
50 000–75 000	1.23 (1.02 to 1.49)	1.02 (0.89 to 1.17)	
>75 000	1	1	
Education			
High school/GED or less	1		1
Some college/vocational/technical school	0.70 (0.47 to 1.04)		1.04 (0.85 to 1.29)
College graduate	0.83 (0.44 to 1.56)		1.05 (0.91 to 1.21)
Graduate school/professional degree	1.12 (0.53 to 2.38)		1.11 (1.03 to 1.21)
Phone			
Landline	1.33 (1.02 to 1.75)	1.07 (1.00 to 1.15)	0.90 (0.89 to 0.90)
Cell	1	1	1
Usual frequency of drinking alcohol in the last 12 months			
5–7 times per week	7.81 (3.39 to 17.95)	0.98 (0.84 to 1.15)	1.32 (1.27 to 1.37)
3–4 times per week	5.50 (2.03,14.88)	1.03 (0.90 to 1.18)	1.44 (1.40 to 1.49)
1–2	3.20 (1.44 to 7.08)	1.07 (0.99 to 1.16)	1.34 (1.28 to 1.40)
2–3 times per month	2.71 (0.64 to 11.42)	1.11 (0.94 to 1.32)	1.25 (1.22 to 1.28)
≤1 time per month	1	1	1
Number of drinks on typical drinking day in the last month			
≥5	4.19 (2.75 to 6.40)	0.93 (0.78 to 1.12)	1.48 (1.31 to 1.66)
3–4	4.31 (2.71 to 6.87)	1.11 (1.01 to 1.21)	1.34 (1.21 to 1.48)
2	3.11 (1.93 to 5.02)	1.14 (1.04 to 1.24)	1.31 (1.28 to 1.33)
1	1	1	1
Number of times binge drinking in the last 12 months			
≥2 times per week	3.87 (2.24 to 6.67)	1.14 (0.94 to 1.39)	1.10 (1.02 to 1.20)
1 time per week	2.50 (1.46 to 4.28)	1.10 (0.91 to 1.32)	1.07 (0.68 to 1.69)
1–3 times per month	2.77 (1.68 to 4.56)	1.01 (0.92 to 1.11)	1.18 (1.04 to 1.35)
<1 time per month	2.22 (1.83 to 2.70)	1.01 (0.92 to 1.11)	1.17 (1.04 to 1.32)
None	1	1	1
Location of last time drinking with others			
Own home	1	1	1
Other's home	1.69 (1.35 to 2.11)	0.98 (0.81 to 1.20)	1.08 (1.03 to 1.14)
Bar, restaurant or club	1.78 (1.422.24)	1.01 (0.87,1.18)	1.11 (1.06,1.17)
Other	0.93 (0.60 to 1.43)	1.19 (1.15 to 1.23)	1.10 (0.99 to 1.23)
Number of times driven after drinking too much in the last month			
0			1.12 (1.06 to 1.19)
1–2			1.06 (0.91 to 1.23)
≥3			1
Ever heard about designated driver program in your city			1.14 (1.10 to 1.18)
Been a designated driver in the last 12 months			1.45 (1.31 to 1.62)
Been with someone else who served as designated driver in the last 12 months		1.62 (1.42 to 1.85)	

GED, General Equivalency Diploma.

*RRs are not reported for variables that were not significant predictors in the multivariate analyses.

they were a designated driver. Of these, 35.7% usually have two drinks on a typical drinking day when not a designated driver, and 21.8% reported that they usually have ≥5 drinks.

In all, 71% reported that they had been with someone else who served as a designated driver in the last year (table 3). Similar to their own behavior when serving as a designated driver, 40% of the designated drivers were reported to have drunk some alcohol on that occasion. However, almost half of

the individuals reported drinking more on that occasion than they usually drink, with approximately half of those having at least three more drinks than they usually drink. An alternative method of transportation after drinking is taxis, reported being used by one-third of respondents.

In multivariable analyses (table 4), having driven after drinking too much was most strongly related to the quantity and frequency of drinking in the last year. In general, there was

a direct positive relationship between the risk of driving after drinking too much and the frequency of drinking, frequency of binge drinking and amount drunk.

The likelihood of serving as a designated driver was increased by 62% in those who had been out with someone else who served as a designated driver in the last 12 months. Use of a designated driver was more in those who had graduate degrees, reported more frequent drinking, drinking large quantities and binge drinking, as well as drinking in places other than their own home.

DISCUSSION

The results of this study confirm the earlier surveys on frequent hazardous drinking by young adults aged 21–34 years.^{19–21} As >40% of people in this age group binged at least once in the last 12 months, and many drink more than once a week, usually at some place other than their own home, it is not surprising that one in five drove after drinking too much in the last month. Moreover, the quantity and frequency of drinking were the factors most strongly associated with drunk driving; other factors such as age, education and income were much less important predictors. These results point to the need for interventions to combat the problem of drunk driving and prevent its associated morbidity and mortality, as well as the need to better understand alcohol consumption patterns and the environmental factors that influence decisions about drinking and driving after drinking.

Our results differ somewhat from the recent 2002 Behavioral Risk Factor Surveillance System data. In that survey, among 21–34-year olds, 4.1% reported driving after having too much to drink in the last month²² compared with our rate of 21%. However, it does agree with a nationwide RDD survey of people aged ≥ 15 years, in which 21% reported driving within 2 h of consuming alcohol, and 10% of these trips were driven with an estimated blood alcohol concentration of >0.08 g/dl.²³

There are some limitations to our study. The response rate of 55% creates a potential bias among the respondents. The importance of RDD surveys for injury research in complementing data from official statistics has been recently discussed,²⁴ as well as the problem of declining response rates.²⁵ As it was an RDD, we were not able to use techniques such as propensity scores to adjust for potential non-response bias.²⁶ However, a recent study found that there was no bias, in reported driving after drinking, created by non-response rates on surveys.²⁷ Another potential limitation is the use of self-report data on drinking. However, investigators in this field have studied this extensively and have concluded that self-report data have adequate reliability and validity.²⁸ Our sample was similar in age and gender to the population of 21–34-year olds in the three cities surveyed, but had fewer individuals in the lowest income and education strata. Because the survey was conducted in March, the study does not reflect any seasonal trends in drinking patterns.

One option is to promote designated driver programs. This concept is familiar to the people of this age group. Two-thirds of individuals had been a designated driver in the past 12 months and 71% had been with someone else who served as a designated driver. A great majority of individuals serving as designated drivers planned on doing so before going out and not after the fact. However, our results raise some areas of concern. Many individuals had at least one drink on the same occasion that they served as designated drivers, although only 3% reported having ≥ 3 drinks thereby making it unlikely that they would exceed the legal limit for blood alcohol concentrations. Passengers in cars driven by a designated driver often drank more than usual—sometimes a great deal more. These concerns have been raised in prior studies on designated

drivers.^{13–15} Any program that promotes the use of this intervention should also address the potential for increasing the amount of hazardous drinking among non-drivers.

Our results indicate that no factor except prior use of a designated driver was a very strong predictor of either being a designated driver or using a designated driver. A recent systematic review of designated programs found insufficient evidence to support or not support the use of these programs and called for further research.²⁹

An alternative method of getting home safely is to use another means such as taxis. One-third of our respondents reported using taxis after drinking. Programs promoting use of taxis, limousines, vans and chartered buses have been reported but have not been rigorously for their effect on drunk driving-related injuries and fatalities. Although these alternative means are safe, their impact may be limited by their reach, their cost and the number of patrons potentially served. Further evaluation of this means is warranted.

Implications for prevention

This study indicates that driving after drinking continues to be a problem in the young adult age group, and other approaches must be examined. The use of designated drivers has been promoted previously, but the evidence for its effectiveness is limited and large-scale studies are needed.⁴ However, as this study indicates, concerns about drinking by those serving as designated drivers¹⁰ and increased consumption of alcohol by those getting a ride home¹² seem to be real and must be addressed. Alternative means of getting to and from bars, clubs and restaurants should be explored, but in a way that is sustainable in the long term for communities. Promoting the use of taxis is one such alternative. However, the lack of clear evidence of the effectiveness of designated driver and safe ride home programs²⁹ indicates the need for community-based studies to evaluate their impact. Such studies will require implementation of broad-based programs with rigorous controlled evaluation, including assessment of changes in reported behavior and trends in alcohol-related citations, crashes, injuries and fatalities.

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Key points

- Among those aged 21–34-year old and driving, nearly two-thirds drank alcohol at least weekly, and one-third binged at least once per month in the last year.
- One in five people in this age group reported that they drove after drinking too much in the last month.
- Two-thirds of individuals reported being a designated driver at least once in the last year, and in most instances, this had been decided before the group went out for the evening.
- When using a designated driver, almost half of the individuals reported drinking more on that occasion than usual, with approximately half of those having at least three more drinks than usual.
- One-third have used taxis to get home instead of driving.
- Promotion of designated driver and safe ride home programs is needed to further reduce the toll of drunk driving.

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