

Correlation Between Actual Versus Self Reported BAL and Number of Drinks Among College Students

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Abstract

Alcohol consumption in college students can affect academic, physical, mental, and social aspects of life. For example, academic problems include lower grade point average, while physical problems include long-term consequences of liver disease, stroke, heart disease, and certain forms of cancer (NCASA, 2007). Not only do college students drink heavily on the weekends, typically Friday and Saturday, but recent studies indicate that Thursday drinking is also part of the social weekend (Finlay et al., 2012; Ward et al., 2013). Thursday drinking is increasing, thereby lengthening the weekend, and also is a function of class schedule (Wood et al., 2007). Regardless of the day of the week, alcohol consumption has been examined via blood alcohol levels (BAL). BAL refers to the ratio of the alcohol in the blood stream. When asked to estimate their BAL, college students over estimated, indicating that college students may not be fully aware of the exact level of alcohol they consume within a night (Kraus et al., 2005). The purpose of this study is to examine estimated BAL, actual BAL, and reported number of drinks consumed in college students across all days of the week. Evening data collection was performed across varying days of the week using breathalyzers. Participants will include college-aged students from a midsized, midwestern university. Across different days of the week, Thursday participants had the lowest relationship between estimated BAL, actual BAL, and reported number of drinks. It seems that Thursday participants had most inaccurate information concerning their drinking.

Keywords: alcohol, BAL, Thursday

1. Introduction

Alcohol consumption rates have remained steady regardless of ubiquitous university attempts at intervention and prevention (NCASA, 2007). Drinking in excess can cause adverse effects, such as engaging in sexual behaviors, driving drunk, and smoking. Between 1993 and 2001, there has been a 37.6% increase in the proportion of college students hurt or injured as a result of their alcohol use (NCASA, 2007). Even more, a 6% rise in deaths among unintended alcohol related injuries has occurred from 1994 to 2001 (NCASA, 2007). Heavy alcohol use by students is associated with tremendous costs to individuals and society, including absenteeism and lower grades, drunk-driving accidents, assaults, and alcohol-related deaths.

Changing the culture of heavy drinking of college campuses is a valued priority of alcohol and developmental researchers, prevention scientists, and college administrators (Finlay et al., 2012). Not only do college students drink heavily on the weekends, typically Friday and Saturday, but recent studies indicate that Thursday drinking is also part of the social weekend (Finlay et al., 2012; Ward et al., 2013). More drinks are consumed on Thursday nights when students do not have Friday classes or when their classes begin after noon on Fridays (Finlay et al., 2012; Wood et al., 2007).

Excessive drinking on Thursday, relative to other weekdays, was found and was moderated by Friday class schedule. Hierarchical linear models indicated that students with no Friday classes drank approximately twice as

much on Thursdays as students with early Friday classes (i.e., mean drinks=1.24 for students with early Friday class vs. 2.41 for students with no Friday class; Wood et al., 2007). Rates and amounts of alcohol consumption on Thursday are high, although they appear to be influenced by the presence and timing of Friday classes. Furthermore, Friday classes, especially those before 10 AM, may reduce excessive drinking on Thursday nights (Wood et al., 2007). This trend of Thursday drinking does not seem likely to stop. A national survey of college students found that only 17% were in favor of a policy of having early Friday classes to discourage Thursday night drinking (NCASA, 2007).

In order to objectively attain measures of alcohol consumption rates and prevalence, breathalyzers are used. These breathalyzers measure the ratio of alcohol content in an individual's bloodstream, also known as the blood alcohol level (BAL). BAL is dependent upon many factors, including age, weight, sex, fat free mass and fat mass, food consumption while drinking, and types of drinks consumed. Current investigations have used BAL as a marker for high-risk drinking (Carey, 2002). This is extremely important, noting there have been approximately 1800 deaths related to alcohol use in a year (NCASA, 2007).

In the study of college drinking, self reported measures are rarely corroborated with direct, objective measures of alcohol consumption, and in most cases these investigations do not assess event-specific relationships among variables (Thombs, 2003). For instance, when asked to estimate their BAL, college students over estimated, indicating that college students may not be fully aware of the exact level of alcohol they consume within a night (Kraus et al., 2005). Another study found that the estimated BAL become less accurate when the subject has higher a BAL (Carey & Hustad, 2002). This is because at a higher BAL, a subject has to recall more drinks and estimate longer time periods (Carey & Hustad, 2002). Furthermore, another study found that the average proportion of variance from estimated BAL was 52% of apparent consumption (Embree & Whitehead, 1991).

Given the widespread nature of college student drinking and the risks associated with it, the current student seeks to examine college student's knowledge about their own drinking and compare it to an objective measure. Due to drinking patterns varying across each day of the week, the each day will be a separate focus. The purpose of this study is to examine estimated BAL, actual BAL, and reported number of drinks consumed in college students across all days of the week. The dependent variable in the study was actual BAL, where the independent variables were days of the week students drank and number of drinks consumed.

2. Methods

2.1. Participants

Participants included college-aged students from a midsized, Midwestern university. Due recommendations from the Institutional Review Board, demographic information was not collected during the evening data collection.

2.2. Procedure

All procedures were approved by the Institutional Review Board (IRB) of the primary author. The 780 participants were approached in the evening across all days of the week. Denials were recorded. If participants agreed to take part, the trained research assistants administered a very short eleven question survey. Day of the week was recorded, as well as start/end time of the survey. Following, the participant was breathalyzed. They were then given information about how to attain their BAL the following day, and were informed that they would be emailed a follow up survey to complete. This online survey was housed with Qualtrics. Participants who completed the follow up survey were entered to win a \$50 gift card.

2.3. Measures

2.3.1 alcohol consumption measures

The participants were asked several questions regarding the alcohol consumption on the evening of the field interview. During the evening data collection and in the follow up online survey, the participants were asked "How many drinks did you consume the night of the BAL survey?" Participants were provided with a definition of a standard drink (i.e., one 12 ounce bottle of beer, one 4 ounce glass of wine, or one 1 to 1.5 ounce shot of 80-proof

liquor). In addition to the number of drinks consumed, participants were asked to estimate their BAL. BAL charts were available for consultation. For BAL, participants were told that 0.08 was the legal driving limit.

2.3.2. *instrument*

Breath samples were collected from participants via the Intoxalyzer 400 PA breathalyzer by CMI Inc. The breathalyzer was factory calibrated. The breathalyzer was first turned on, and the researcher waited until it read “ready.” Then, a tube was inserted into the corresponding hole on top of the breathalyzer. The participant was instructed to blow into the tube as if he or she was “blowing out candles.” Once the breathalyzer double beeped, the participant was instructed to stop blowing. Then, the breathalyzer analyzed the data. Researchers waited until the breathalyzer read “ready” to begin another trial.

Breathalyzer screens were concealed from participants and researchers during data collection (double blind). Participants could call the following day to attain their BAL if they desired. Those conducting breathalyzer tests had to make sure that if the participant was smoking, that they refrained for at least 2 minutes from smoking before being breathalyzed to avoid harm to the breathalyzer. Those who seemed to be extremely intoxicated were not approached to be a part of the study.

3. Results

On Thursday, the mean drinks students reported that were consumed during the night of the BAL survey was 5.33 ($SD = 3.73$). In addition, 13 people continued to drink after their alcohol survey.

Regarding Thursday drinking, when comparing actual BAL with estimated BAL, there was a correlation of .52. Correlating the amount students said they drank saw at the time of the survey with the amount they said they drank on the follow up survey, there was a very strong correlation of .77. Yet, this was not as correlated to the BAL on the night of the survey. There was a stronger relationship on Thursday with BAL than the day following. Only 31 people completed the follow up survey.

In addition to Thursday drinking, other days of the week were examined. Monday drinkers had high correlations with actual BAL with estimated BAL as well as amount students said they drank saw at the time of the survey with the amount they said they drank on the follow up survey, with correlations of .80 and .98, respectively. Yet, it is important to note that only 11 people completed the follow up survey on Monday. Wednesday drinkers showed the same type of information, as both of the correlations were again very strong, at .66 and .99, respectively. Only 12 people completed the Wednesday follow up survey.

There were 25 people who completed the follow up survey on Tuesday. The correlation with actual BAL with estimated BAL was .67, whereas the amount students said they drank saw at the time of the survey with the amount they said they drank on the follow up survey was .88.

Interestingly, Friday and Saturday drinkers showed correlations that weren't as strong regarding actual BAL with estimated BAL and with the amount students said they drank saw at the time of the survey with the amount they said they drank on the follow up survey. For Friday, these correlations were .45 and .70, respectively. These correlations for Saturday were .58 and .84, respectively. In addition, there were a lot more participants for Friday and Saturday than other days of the week, at $n = 42$ and $n = 86$, respectively.

Regarding Sunday drinking, only 11 students completed the follow up survey. The correlation with actual BAL with estimated BAL was .73, whereas the amount students said they drank saw at the time of the survey with the amount they said they drank on the follow up survey was 1.00. It is important to note that there were only 2 people who completed the follow up survey, making a perfect correlation between the amount students said they drank saw at the time of the survey with the amount they said they drank on the follow up survey.

Table 1. correlation coefficients for varying days of the week

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Drinks consumed night of BAL survey vs. amt of drinks reported initially	NA	0.98**	0.88**	0.94**	0.76**	0.70**	0.84**
BAL vs amt of drinks reported initially	0.73**	0.80**	0.67**	0.66**	0.52**	0.45**	0.58**
BAL vs drinks consumed night of BAL survey	NA	0.71**	0.25	0.71**	0.34	0.71**	0.60**

**correlation is significant at the 0.05 level (2-tailed)

4. Discussion

Although researchers have examined alcohol consumption and BAL, drinking on various days of the week, BAL, and reported number of drinks has not been examined. Thursday drinking in itself is a special occasion, as it differs from other days of the week. Additionally, there seems to be a certain “culture” associated with Thursday drinking. BAL is used as a useful measure to examine one’s blood alcohol level, but many are not aware what BAL exactly is. For this reason, when asked to estimate BAL, many are totally off of what the range should be for a “normal” BAL within reasonable ranges.

Compared to other studies, this study showed similar results regarding the validity of self-report data. Anecdotally, not many participants knew what BAL was and the research assistants had to explain it to them. People providing extreme values (e.g., 10, 1.2, 1.5, .5, or .7) were removed prior to data analysis. Contrasting from other studies, it was found that most participants overestimated their BAL, which was not in line with the hypothesis originally stated. This overestimation of BAL compared to actual BAL is a marker that students need to be informed of what BAL is and what is the normal ranges for it while drinking.

Overall, regarding Thursday drinkers, the results are mixed. With Monday drinkers, they were better at remembering how many drinks they had on that night, so they might have a better idea of their BAL. This may be due to the fact that the Monday drinkers are more aware of how much they drink, and perhaps are not aiming to get drunk, as this is the case for many on the weekends. Further research is warranted. On the days when more people out, they were less likely to remember how many drinks they had. On days when people don’t drink as much in excess, it was easier to remember how many drinks they had, and there was a stronger relationship with BAL that they estimated and had. The correlations found also may be attributed to what day a person goes out, which can define one’s personality traits and how likely they are to drink depending on the occasion.

Limitations of the study include researchers recruiting their friends to do the study, people being too drunk to recall from memory the number of drinks consumed or where they drank, collecting data in the same spot every evening (mainly getting participants who go to the bars), and the validity of the self-report data. In addition, we may have gotten the same people multiple times for a given night, which would not give a completely random sample. In addition, the same “types” of people were found to go out on certain nights of the week and engage in drinking. Again, this may have to do with their personalities. This study provides an initial examination of the relationship between the days of the week and BAL. Further research and education is needed.

Drinking patterns of college students may be unsafe, both for the student’s health and the safety of others. Students have started to treat Thursday as a special drinking occasion, and consume more on Thursday nights when they don’t have Friday classes. With Thursday drinking, there is no natural recovery day, which can lead to even more negative health effects. Students may also schedule their classes around their social life, and adversely impact their academic progress. In addition, participants who cannot recall how much they have drunk within a given night may drink more than they had originally planned, and their health may suffer as a result. Overall, it is important to attempt to implement strategies against high risk drinking to not only decrease injuries and deaths, but also restore one’s psychological, physical, and social quality of life.

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