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Students Estimating Their Own BAL Under the Influence

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Abstract

Alcohol consumption continues to be a problem on college campuses. Students drink heavily on the weekend[1] and experience consequences as a result of the heavy drinking (e.g., hangovers, headaches, assaults, missed classes)[2]. It is estimated that over 40% of college students could be classified as heavy drinkers -- 5 or more drinks in a row for men and 4 or more drinks in a row for women[3]. It is unknown if during a drinking episode if a student can perceive or estimate his/her level of intoxication or blood alcohol level (BAL). The purpose of this experiment is to determine if there is a bigger difference in estimated BAL and actual BAL on different days of the week. The data will then be compared to see if those differences in estimated BAL and actual BAL differ across genders. The data will be collected at night using breathalyzers over days of the week. College students will be approached and asked how many drinks him/her have consumed and to estimate his/her BAL. The participants will be breathalyzed to measure his/her actual BAL. Once the data is collected, the data will be analyzed to see if certain days had smaller or larger differences in the estimated and actual BAL and what gender was more accurate in his/her estimations. Participants will be college students from a mid-sized midwestern university. The anticipated findings are that participants will underestimate his/her BAL and that there will be a bigger difference in the estimated BAL and actual BAL on nights when participants have consumed more alcohol[4]. Friday and Saturday nights are associated with more alcohol consumption among college students; therefore, it is expected that there will be a difference in estimated BAL and actual BAL on those nights[5]. It is also anticipated that males will be more accurate with estimating his BALs because males tend to have more experience with drinking. Therefore, this can lead to better knowledge of how many drinks are consumed in a given night[6]. These findings will result in a better understanding of how much students actually drink, considering many students tend to be unaware of how much alcohol he/she consumes and for others to be aware of what days of the week are most popular for consuming alcohol.

Keywords: Alcohol, Blood Alcohol Level (BAL), Estimated BAL

1. Introduction

College students around the country abuse alcohol. Alcohol consumption causes many health problems for college students including about 1800 deaths a year[7]. Due to student emergency alcohol related incidences, it costs a mid-size university on average $500,000 a year[8]. College students also experience negative consequences with high alcohol consumption and intoxication levels, including hangover and blackouts[9], assault[10], high-risk sexual behavior[11], driving under the influence[12] and acquiring alcohol related disorders[13]. Specifically, approximately 599,000 college students experience an injury due to their personal alcohol consumption, 696,000 college students experience assault by another intoxicated student and 97,000 college students are involved in a sexual assault incident or fall victim to date rape by another college student who is under the influence[14]. One objective way of measuring intoxication levels is blood alcohol level (BAL). This is a measurement of how much alcohol is in one's body by measuring the "weight of alcohol in the bloodstream per unit of blood volume."[4]

The blood alcohol level index ranges from 0.00 to 0.40. At different BALs, there are different effects. At BALs 0.02 to 0.03, one tends to experience slight euphoria, tends to become more outgoing and coordination is not impaired. At 0.04 to 0.06, people have a tendency to feel more relaxed, an increased feeling of well-being, a feeling of warmth and increase euphoria. One's inhibitions, reasoning and memory are slightly lowered. At 0.07 to 0.09, a person's balance, speech, vision, reaction time and hearing are impaired slightly. One is still experiencing euphoria while also experiencing increased impairment in reason, memory and caution. One's judgment and self-control are also reduced. At BALs between 0.10 and 0.125, one's motor coordination and judgment is significantly impaired. One's speech is slurred, while balance, vision, reaction time and hearing is significantly impaired. At 0.13 to 0.15, there is complete impairment of one's motor actions while also experiencing lack of physical control. One tends to experience significant impairment in vision and balance. Euphoria begins to decrease and dysphoria starts to occur. At 0.16 to 0.20, there is a significant increase in dysphoria and one may experience nausea. At 0.25, one usually needs help walking and experiences total confusion. Vomiting may occur. One experiences a complete loss of consciousness when having a BAL of 0.30. At a BAL of 0.40 and above, a person would begin to go into a coma and death may occur due to respiratory arrest[15].

In past studies when students have been asked to estimate their BAL, students with lower BALs overestimated and students with higher BALs underestimated[16]. Therefore, as one's intoxication level increases, the accuracy of self-reported estimated BAL decreases[4]. In a past study, it was observed that college students are unaware of the definition of a standard serving of alcohol[17]. When students were asked to state or show what was thought to be a single serving size of alcohol, students overestimated demonstrating a serving of alcohol to be 4.5 ounces rather than the standard size of 1.5 ounces[17]. Despite the educational programs students are exposed to, uncertainty and hesitation on whether students can correctly estimate their BAL while under the influence continues to exist[18].

Although past studies have examined the differences between estimated and actual BALs in college students, no studies have examined the differences between estimated and actual BALs on different days of the week. This is an important aspect to be studied because it gives the law enforcement on college campuses an idea of what days of the week student's alcohol consumption is expected to be the greatest.

The purpose of this study is to examine the differences between student's estimated BAL and actual BAL on different days of the week. This study explored college student's drinking habits during different days of the week to improve knowledge of when alcohol consumption occurs most often during the week. This study also examined how students estimate their BAL while intoxicated. This builds upon the previous studies by further exploring specifically what days of the week college students are better or worse at estimating their BAL.

2. Methods

2.1 Participants

Participants included 692 college students from a mid-size midwestern university. Participants were recruited in the bar district of the university on Monday through Sunday nights for four weeks, 2 weeks during the fall semester and 2 weeks during the spring semester. The criteria for participants included being a current student of the university.

2.2 Procedure

The research team was present in the bar district of the mid-western university and had paper- based surveys and breathalyzers. Data collection occurred between the hours of 10 p.m. and 1:30 a.m. on Monday through Sunday nights for four weeks during the fall and spring semesters. All research team members were trained on how to approach intoxicated students, how to administer the survey and take a breath sample with a breathalyzer. All procedures were approved by the Institutional Review Board.

The team recruited participants by approaching students asking if they want to participate in a survey regarding alcohol. Participants were informed that the study would consist of (a) completing a paper-based survey, (b) giving a breath sample, and (c) receiving a business card with a phone number and an alias identification number on it in which the participants can call the next day to retrieve their BAL from that night. Students were told that they would not be able to see their BAL the night of their survey for their own safety. Neither participants nor the research team were able to see the results of the breath sample that night. If students agreed to participate in the study, they were asked if they were interested in receiving a consent form. The participants were then asked a series

of questions, in which the research team recorded the answers, and then participants were breathalyzed. Potential participants who seemed to be too impaired (e.g. slurring, stumbling) where not recruited for the study.

2.3 Measures

The paper-based survey consisted of 11 questions about their drinking habits that night, including a question estimating their BAL. Each student was provided with the definition of a standard drink in order to estimate correctly (i.e. one 12 ounce bottle of beer, one 4 ounce glass of wine, or one 1.5 ounce shot of liquor). Other questions included "Have you been drinking?," "Are you finished drinking?," "Where did you drink?," "What type of alcohol did you drink?," "How many drinks have you had, according to a standard drink?," "What time did you start drinking tonight?," "Are you celebrating anything?," and "Do you have class tomorrow?".

2.4 Instruments

The Intoxilyzer® 400PA is an automatic breathalyzer that displays results in the matter of seconds. It is a factory calibrated breathalyzer and is considered part of the NHTSA Products List. This breathalyzer has the ability to disable when calibration is overdue, which ensures accuracy. This is a key feature that separates the Intoxilyzer® 400PA from all other breathalyzers. The Intoxilyzer® 400PA can operate in three modes- Precursory, Analyze, or Precursory/Analyze. For the purpose of this study, only the Analyze mode was used. Intoxilyzer® 400PA comes standard with a 500 test memory bank. The memory bank helps to keep participants anonymous when analyzing the data (CMI Intoxilyzer® 400PA; CMI, Inc., Owensboro, KY).

2.5 Data Analysis

Data analysis was completed using Statistical Package for the Social Sciences (SPSS) version 20.0. Mean, median, mode and standard deviation were calculated for each of the categories to get descriptive results. Frequencies were calculated for each of the categories to get the number of occurrences for each response. Correlation tests were conducted for each day of the week to determine if the statistically significant results occurred between estimated BAL and actual BAL.

3. Results

Estimated BALs reported (M = 0.08, SD = 0.06) and actual BALs (M = 0.06, SD = 0.05) were related, r = 0.575. There was also a significant relationship between the differences between estimated BALs and actual BALs during all the days of the week. Tuesdays had the highest correlation between estimated BALs (M = 0.08, SD = 0.05) and actual BALs (M = 0.07, SD = 0.04), r = 0.644. Thursday had the smallest correlation between estimated BALs (M = 0.07, SD = 0.05) and actual BALs (M = 0.07, SD = 0.05), r = 0.464.

Table 1. mean estimated BAL, mean actual BAL and correlation in relation to days of the week (N=692).

Day	Sample Size (N)	Estimated BAL (Mean ± SD)	Actual BAL (Mean ± SD)	Correlation Coefficient
Monday	37	0.06 ± 0.06	0.05 ± 0.04	0.600
Tuesday	96	0.08 ± 0.05	0.07 ± 0.04	0.644
Wednesday	39	0.09 ± 0.05	0.07 ± 0.05	0.521
Thursday	112	0.07 ± 0.05	0.07 ± 0.05	0.464
Friday	156	0.10 ± 0.07	0.07 ± 0.05	0.528
Saturday	229	0.07 ± 0.06	0.05 ± 0.05	0.626
Sunday	11	0.08 ± 0.05	0.07 ± 0.04	0.638

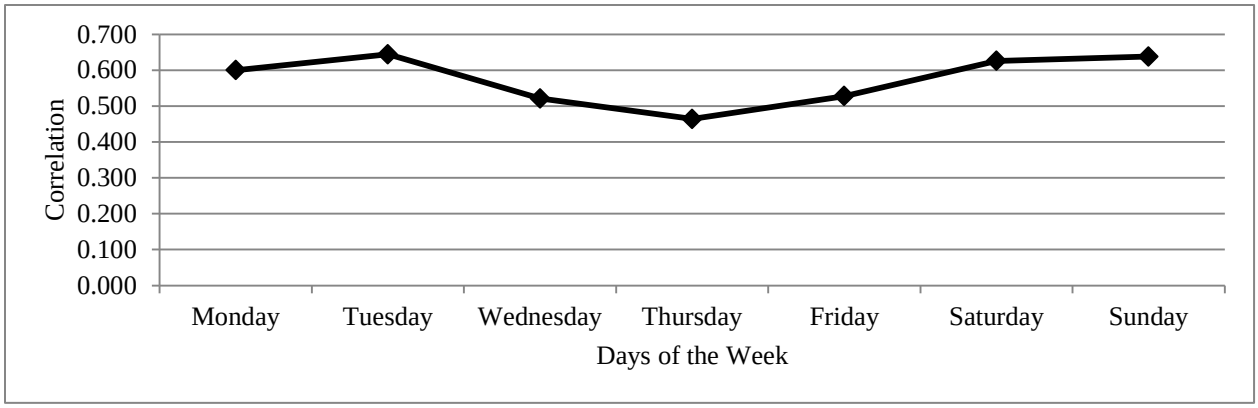

Figure 1. Distribution of correlation between estimated BAL and actual BAL during the days of the week (N=692).

4. Conclusion

The results suggest that students tend to overestimate their BAL, instead of underestimating as hypothesized. This indicates that overall, students thought that their BALs were higher than their actual BALs. With the exception of Mondays, the overall mean estimated BAL was higher than the overall mean actual BAL. Therefore, the hypothesis was not supported.

It was hypothesized that on Friday and Saturday nights, there would be a bigger difference in estimated and actual BALs because students tend to drink more on those days[5]. This hypothesis was not supported either. It was found that Thursday nights, there was a bigger difference between estimated and actual BALs. The smallest difference between estimated and actual BALs occurred on Tuesdays.

Of the 692 participants, 84% reported consuming alcohol the night of the interview. Only 41% of the total participants reported that they were finished drinking. Majority of the participants consumed beer that night, with vodka being the next highest consumed type of alcohol. Participants consumed 5.40 drinks on average (SD= 4.19).

The conclusions of this study were compatible with the results found in past research. The results suggest that college students have trouble estimating their BAL while intoxicated[18]. There is uncertainty if students can accurately estimate their BAL while intoxicated, even if the students are educated about how to estimate their BAL[18].

Overall, the results imply that since Thursday nights had a larger difference between actual and estimated BAL, many students consider Thursday night as part of the weekend, even if students have class on Fridays. The implications also include that students no longer consider just Friday and Saturday nights as the weekend for drinking purposes, but now include Thursday nights as a weekend night for drinking.

This study does have limitations. First off, the study consisted of most people coming from the bars. There were only a handful of participants coming from house parties and student dormitories. This means that there was a select cliental in this study and the results may not be representative of all college student alcohol consumption. Also, this study included a self- report response when estimating their BAL. The participants were asked a series of questions under the influence and may not have been as accurate with their responses. Some participants had to ask their friends about their drinking habits that night in order to answer some of the questions, since their memory may have been impaired due to the alcohol consumption. Some participants were recruited in groups. In most cases, if one person in the group chose to participate, some of the others with them chose to participate also. This suggests that the sample was not independent. Finally, some participants are more likely to participate in a research study than others. In many cases, participants who were part of a research group were more likely to participate in the study than participants who were not.

Exploring college student's drinking habits over different days of the week makes students aware of their alcohol consumption and educates them on how to estimate their BAL.

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