Effect of Alcohol Consumption on College Student’s Academic Performance

Lauren Powers
Kinesiology and Health
Miami University
501 East High Street
Oxford, Ohio 45056

Faculty Advisor: Dr. Rose Marie Ward

Abstract

Alcohol consumption in college students continues to affect student’s academic performance. Student’s alcohol consumption relates to poor academic performance, criminal and social issues. Moreover, alcohol abuse continues to increase among college students and directly associates with decreased academic performance. Specifically, alcohol consumption relates to students not attending classes and not completing schoolwork in a timely manner. Past research emphasizes the effects of alcohol consumption and academics in college students, but not how alcohol consumption affects student’s grade point average (GPA). The purpose of this study is to determine the relationship between alcohol consumption in college students and GPA. It is hypothesized that there will be a negative correlation between alcohol consumption and grade point average, meaning that the higher the participant’s blood alcohol level (BAL), the lower the participant’s GPA. Participants included undergraduate students (n=229; 53.3% females; 90.8% Caucasian) aged 18-23 (M=20.3, SD=1.54), from a mid-sized, midwestern university. Evening data was collected using breathalyzers during all days of the week and multiple weeks of the school year. Participants were asked a series of questions about his/her drinking episode that night. The participants were breathalyzed to measure his/her blood alcohol level (BAL). Participants received an online survey the morning after the evening survey, which included questions about demographics, academic performance, and drinking patterns. The higher the participants’ evening BAL related to the participant having a lower GPA, r(210)=-.20, p=.03. GPA is inversely correlated to number of days a participant drinks, r(203)=.24, p<.001, number of drinks the participant consumes in a typical episode of drinking, r(201)=.22, p=.02, and the participant’s peak drinking occasion, r(198)=-.30, p<.001. A structural equation modeling test examined risky drinking behaviors (number of days the participant consumed alcohol, how many drinks the participant consumed, and peak drinking occasion) and negative consequences predicting GPA. The model fit the data well, \( \chi^2(n=217, 4)=6.87, p=.14, \text{CFI}=.99, \text{TLI}=.98, \text{RMSEA}=.06 \) (CI90=.00-.13). These results show that risky drinking behaviors are predictors of GPA and that a correlation exists between risky drinking behavior and negative consequences. Knowing that alcohol consumption affects academic performance is crucial for students to recognize the academic effects of risky drinking behavior.

Keywords: College Students, Alcohol Consumption, Academic Performance

1. Introduction

Alcohol consumption in college students is an ever-present problem that has lead to many academic and health-related negative consequences. Approximately two-thirds of college students reported consuming alcohol within one month with half admitting to binge drinking within the past 2 weeks. Binge drinking is defined as five or more drinks consumed in one drinking episode for males and four or more drinks consumed for females. Approximately 1800 college students die every year from health problems due to alcohol consumption. College students often experience negative alcohol-related consequences, including hangovers and blackouts, sexual assault, driving
under the influence\textsuperscript{10}, and academic problems\textsuperscript{11}. The most common way of measuring intoxication levels is blood alcohol level (BAL). This measures the amount of alcohol in one’s blood per unit of blood volume\textsuperscript{12}.

The BAL scale ranges from 0.00 to 0.40, with all numbers having different effects. From BALs 0.02 to 0.03, slight euphoria occurs with no impairment of coordination and one usually becomes more outgoing. From BALs 0.04 to 0.06, one tends to experience more relaxation, warmth and well-being, with increased euphoria. One also experience lower inhibitions, reasoning and memory. From BALs 0.07 to 0.09, one is more inclined to experience impaired balance, speech, vision, hearing, reaction time, reason, memory and caution, with a reduction in judgment and self-control. At BALs 0.10 to 0.125, one experiences a significant impairment in motor coordination, judgment, speech, balance, vision, hearing and reaction time. From BALs 0.13 to 0.15, there is an even more significant decrease in motor actions, vision and balance. One loses physical control and starts to experience dysphoria. From 0.16 to 0.20, dysphoria increases significantly and one tends to experience nausea. At 0.25, one experiences total confusion and needs assistance walking, while vomiting usually occurring. At BAL 0.30, there is a complete loss of consciousness. From BAL 4.0 and above, a person would go into a coma and may experience respiratory arrest, leading to death\textsuperscript{13}.

Past research has shown that alcohol consumption can negatively affect memory function, no matter the dosage\textsuperscript{14}. In a study performed, results indicated a negative relationship between the number of words the participants recalled and amount of alcohol consumed\textsuperscript{15}. Memory is not just affected by alcohol consumption but also during hangovers\textsuperscript{16}. Another study found that heavy alcohol consumption has been associated with deficient memory\textsuperscript{17}. Therefore, alcohol consumption in college students can affect participant’s memory to remember information that was learned in classes, which can affect GPA.

One major consequence college students may experience is academic issues. Past research has shown that there is a strong relationship between alcohol consumption and academics in college students\textsuperscript{4}. According to The National Center on Addiction and Substance Abuse (CASA) at Columbia University, 41% of college students experience academic problems and 28% drop out of school due to alcohol-related negative consequences\textsuperscript{11}. It has also been found that 20% of college students experienced poor academic performance and 30% missed class as a result of alcohol consumption\textsuperscript{18}. According to the 1999 College Alcohol Study, college students who identified themselves as heavy or binge drinkers experienced many academic issues\textsuperscript{3}. Of the 14,138 participants, 62.5% reported skipping class and 46.3% reported falling behind in their classes\textsuperscript{3}. The chance of a college student falling behind academically increases by 5.4%, while the chance of missing class increases by 9% for every additional drink that is consumed in one drinking episode\textsuperscript{19}. It has been reported that due to alcohol consumption or alcohol-related negative consequences (i.e. hangovers), males tend to experience more academic problems, while females tend to miss class more\textsuperscript{20}. On average, students who have higher GPA’s consume fewer drinks per week than students who have lower GPA’s\textsuperscript{18}. On average, students with an A GPA consume 3.3 drinks/week, a B GPA consumes 4.8 drinks/week, a C GPA consumes 6.1 drinks/week and a D or F GPA consumes 9 drinks/week\textsuperscript{18}. It has also been found that there is a relationship between heavy drinking and low GPAs\textsuperscript{4}. Heavy drinking leads to lower GPA’s because it takes time away from hours that could be spent studying\textsuperscript{1}. Students who study daily and consume little to no alcohol obtain higher grades and GPAs compared to those students who do not study daily and drink heavily\textsuperscript{21}.

Although past studies have examined the effect of alcohol consumption on academics in college students, no study has collected actual data to determine this relationship. Collecting data to study this topic is important because it shows that a relationship exists. The purpose of this study is to determine the relationship between alcohol consumption in college students and GPA. It is hypothesized that there will be a negative correlation between alcohol consumption and grade point average, meaning that the higher the participant’s BAL, the lower the participant’s GPA.

2. Methods

2.1 Participants

Participants included 229 undergraduate college students ($n=229$; 53.3% females; 90.8% Caucasian) aged 18-23 ($M=20.3$, $SD=1.54$), from a mid-sized, midwestern university. Participants were recruited Monday through Sunday nights, two weeks in the fall semester and two weeks in the spring semester, in the bar district of the university. The morning after being recruited, participants were sent two follow-up surveys. Participants recruited had to be a current student of the university.
2.2 Procedure

The research team recruited participants in the bar district of the mid-sized, midwestern university and held paper-based surveys and breathalyzers. Data was collected Monday through Sunday nights for four weeks, two weeks during the fall semester and two weeks during the spring semester, during the hours of 10 p.m. and 1:30 a.m. All research team members were educated on how to approach intoxicated participants, how to administer the paper-based survey and how to use a breathalyzer in order to obtain a breath sample. All procedures were authorized by the Institutional Review Board.

The participants were recruited by being approached by the research team members and asked if they would be interested in participating in an alcohol-related survey. Participants were made aware that the study would consist of (a) completing the paper-based survey that night, (b) giving a breath sample using a breathalyzer, (c) not being able to see their BAL that night for safety reasons, (d) receiving a business card consisting of a phone number and an identification number in which the participants can call 24 hours or later to retrieve their BAL from the previous night, and (e) completing the two follow-up surveys they would be sent via email the next morning. Neither the participants nor the research team were able to see participants BAL that night due to safety reasons of both parties.

If participants were interested in participating in the study, they were asked if they wanted a consent form explaining the study. The participants were then asked a series of questions about their alcohol consumption that night (i.e. number of drinks consumed, start time of drinking), then breathalyzed. Research team members recorded answers to ensure accurate data. College students who seemed too intoxicated (i.e. stumbling) were not recruited for the study.

Participants were then sent an online survey via email asking about demographics, academic performance and drinking patterns.

2.3 Measures

The paper-based survey consisted of 11 questions about their drinking patterns that night. 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?”

The online-based survey emailed to the participants included questions about demographics, their drinking behaviors (i.e. “In a typical week, on how many days do you have at least one drink containing alcohol?”, “How many drinks do you have on a typical day when you are drinking?”, and “During the last 30 days, what is the highest number of drinks that you drank on any one occasion?”) and academics (i.e. “What is your current GPA?”). The online-based survey also included the Rutgers Alcohol Problem Index (RAPI), which is a 23-question index used to assess problem drinking in adolescents.

2.3.1 demographics

Participants answered demographic questions in the online-based survey about age, year in school, gender, race, and ethnicity.

2.3.2 alcohol consumption variables

Alcohol consumption was measured using the participant’s BAL. Risky drinking behaviors were also assessed to determine the participant’s alcohol consumption the night of the survey and overall drinking patterns. Participants were asked in the online-based survey questions about the number of days the participant drinks, the number of drinks the participant consumes in one drinking episode and the participant’s peak drinking occasion.

2.3.3 rutgers alcohol problem index (RAPI)

The RAPI was used to assess problem drinking in the participants. This index consists of a main question asking participants “How many times has this happened to you while you were drinking or because of your drinking during
the last year?” Participants are then to rank the situations with 0= none, 1= 1-2 times, 2= 3-5 times, or 3= more than 5 times.

2.3.4 academics

Participants answered questions about their overall and current academics in the online-based survey. Questions were focused on how many credits the participant’s enrolled in and last semester and overall grade point average.

2.4 Instruments

The Intoxilyzer® 400PA was used to collect the participant’s BAL. This instrument is an automatic breathalyzer that displays the BAL in seconds. It is a factory calibrated breathalyzer and is included in the National Highway Traffic Safety Administration (NHTSA) products List. This breathalyzer is highly accurate because it disables when calibration is overdue. This is an important feature that separates the Intoxilyzer® 400PA from all other breathalyzers. There are three modes in which the Intoxilyzer® 400PA can operate—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, which ensures to keep participants anonymous when analyzing the data (CMI Intoxilyzer® 400PA; CMI, Inc., Owensboro, KY).

2.5 Figure

![Figure 1. Structural equation modeling map for the relationship between risky drinking behaviors, alcohol-related negative consequences and GPA.](image-url)
3. Results

Results were analyzed using SPSS and MPlus.

Results indicate that there is a significant relationship between GPA ($M = 3.3, SD = .48$) and Blood Alcohol Level ($M = 0.05, SD = 0.04$), $r(210)=-.20, p=.03 (p<.05)$. GPA was also related to number of days a participant drinks ($M = 2.3, SD = 1.3$), number of drinks the participant consumes in one drinking episode ($M = 5.3, SD = 3.4$), and the participant’s peak drinking occasion ($M = 9.2, SD = 5.3$).

GPA is inversely correlated to number of days a participant drinks, $r(203)=-.24, p<.001$, number of drinks the participant consumes in a typical episode of drinking, $r(201)=-.22, p=.02$, and the participant’s peak drinking occasion, $r(198)=-.30, p<.001$.

A structural equation modeling test was run to assess risky drinking behaviors (number of days the participant consumed alcohol, how many drinks was consumed, and peak drinking occasion) and negative consequences predicting GPA. The model fit the data well, $\chi^2(n=217, 4)=6.87, p=.14, CFI=.99, TLI=.98, RMSEA=.06$ (CI90=.00-.13).

4. Conclusion

It was hypothesized that there will be a negative correlation between alcohol consumption and GPA. The results of this study suggest that there is a significant relationship between GPA and BAL in college students. The results support the hypothesis in that there is a negative relationship between GPA and BAL, meaning that as a participant’s BAL increases, the participant’s GPA decreases.

The results also show that GPA is negatively associated with the number of days a participant consumes alcohol, the number of drinks the participant consumes in one drinking episode and the participant’s peak drinking occasion. This indicates that as the number of days a participant consumes alcohol, the number of drinks a participant consumes in one drinking occasion and/or the participant’s peak drinking occasion increase, GPA decreases by the corresponding p-value.

The structural equation modeling test results suggest that the number of days a participant drinks, the number of drinks the participant consumes in one drinking episode and the participant’s peak drinking occasion are all predictors of GPA. Specifically, it is not problems with alcohol that predict GPA, but is the amount of alcohol consumed. Therefore, the experience of alcohol-related negative consequences does not seem to hinder academic performance. It is possible that a measure of alcohol-related academic consequences is needed to further examine this relationship. When RAPI was included in the structural equation modeling test, the relationship between number of days a participant drinks the number of drink the participant consumes in one drinking episode and the participant’s peak drinking occasion and GPA became more negative, meaning that these variables became greater predictors of GPA. Therefore, when alcohol-related negative consequences are incorporated into the structural equation modeling test, results show that there is a greater effect on GPA. This could be due to participants missing class due to alcohol-related negative consequences.

The conclusions of this study were compatible with past research. The results suggest that alcohol consumption negatively affects a college student’s GPA and that the number of days a participant consumes alcohol, the number of drinks a participant consumes, the participant’s peak drinking occasion and negative consequences are all predictors of participant’s GPA.

This study does have limitations. First, this study was homologous in ethnic and racial demographics. Future studies should examine this relationship in more diverse ethnic and racial groups to see if the results still apply to the results of this study and past research. Second, this study consisted of self-report data. This suggests that not all data collected during the night paper-based survey and the online-based survey could have been accurate. Participants were recruited and asked questions for the paper-based survey under the influence of alcohol. In many cases, participants had to ask friends the questions about their drinking habits that night. Also, participants were asked to self-report their GPA. This data was not collected from the university and could be inaccurate. Lastly, a majority of the participants were coming from the bar-district of campus. There were only a handful of participants coming from house parties or dormitories. This suggests that there was a select cliental in this study and the results may not be representative of all college students drinking behaviors.
Exploring the relationship between alcohol consumption and GPA in college students is important because it makes students aware of how their drinking behaviors affect their academics and how it can be predictive of their future overall GPA.

5. Acknowledgements

Special thanks to Dr. Rose Marie Ward, Miami University’s Office for the Advancement of Research and Scholarship for the Undergraduate Presentation Award, the LEAF Fund for providing funding to collect data and the Department of Kinesiology and Health.

6. References

11The National Center on Addiction and Substance Abuse (CASA) at Columbia University. (1994). Rethinking rites of passage: Substance abuse on America’s campuses.


