A Correlational Study on Alcohol Use, Smoking Consequences, and Demographic Factors Among Students

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Abstract

The purpose of this study was to determine how beliefs about the effects of smoking are related to alcohol use among students on a university campus. An online survey with a sample of 100 students between the ages of 18 and 28 years old completed the CAGE questionnaire (for alcohol use) and Smoking Consequences Questionnaire (SCQ) as well as a demographic data sheet. Participants' mean age was 22.04 years old and the participants were relatively evenly gendered, with a range of socioeconomic backgrounds. Results of mean SCQ scores showed that these beliefs about smoking were varied and slightly favorable with a mean of 57.3 (SD = 11.4) indicating some students believed that smoothing would serve to reduce stress or facilitate social interactions. Statistical analysis found evidence that stated the first hypothesis to be true that alcohol use is present in the sample (t = 12.47, p < .001). Support for the second hypothesis was provided in that SCQ scores significantly differed from a neutral expectancy baseline (t = 9.73, p < .001). Support was also found for the third hypothesis as a strong positive correlation (r = 0.57, p < .001) was found to exist between alcohol use and smoking consequence beliefs. The fourth hypothesis that demographic variables including age, gender, and socioeconomic status would only be weakly and in consistently associated with substance measures was not fully supported; demographic variables showed only weak and inconsistent associations with substance use measures. These results stress the psychological closeness of alcohol and tobacco use in young adults and show implication of the cognitive expectancies as an important intervention site. The results support the need for integrated substance use prevention strategies operating both on the behavioral and the belief system levels of university campuses.

Keywords: alcohol use, smoking beliefs, students, CAGE, SCQ, substance use, cognitive expectancies, university population

Introduction

Globally, substance use is still a major public health issue and alcohol, and tobacco are among the most used substances particularly among younger populations. Given that students in college and universities are vulnerable as the stage in life has newly found independence, stress, peer influence and identity exploration (Johnston et al., 2020). These factors are largely implicated with experimentation and routine use of psychoactive substances and account for the co-occurrence patterns of alcohol consumption with tobacco smoking. There is well established research on patterns of alcohol use and smoking coming together and that this pattern reinforces the relationship between use and dangers of both behaviors. Harmful use of alcohol accounts for approximately 5.3% of all deaths globally (WHO, 2021, and tobacco

use is reported by the World Health Organization (WHO, 2021) as the leading cause of preventable death worldwide. However, surprisingly, patterns traced out in these years can predict long term SUDs, chronic health problems, and psychosocial dysfunction.

According to Monitoring the Future (MTF)'s 2021 national survey of college students 19–22 years of age, 56.4 percent had consumed alcohol in the past 30 days and 28.9 percent had binged (Johnston et al., 2021). Moreover, 12.1% of this same group said they had used cigarettes during the same timeframe. Although cigarette smoking has decreased in the overall population, rates are high among 3 college students, especially in the case of alternative tobacco, e-cigarettes which are increasingly popular. To this day, peer influence continues to be a main factor in the determination of substance use among students. For example, Arora et al. (2020) study reported that among their longitudinal study of adolescents, students with friends who were drinking or smoking were three times more likely to engage in those same behaviors themselves. Both initiation and maintenance of substance use are predicted highly by peer models, perceived social acceptance, and the desire for strong social integration. 4 Prevalence rates are also based on socioeconomic status (SES). Students from the higher SES tend to have greater financial access to substances, while students from lower SES tend to use substances due to environmental stressors and stressors in their environment, a lack of recreational alternatives, and neighborhood norms (Miech et al., 2022). In this way, SES functions as a risk and protective factor, according to the contextual dynamics.

Alcohol and nicotine are both neurobiologically addictive because they act on the reward pathways of the brain, with certain dopaminergic systems and the tasting and reinforcement processes. The use of alcohol and nicotine together can be additive or even synergistic, resulting in stronger effects of euphoria and relaxation (Littlefield et al., 2020). The result of this interaction is such that drinking and smoking behaviors tend to be more associated together making the students more predisposed to do both at the same time. Patterns of co-use have also been observed to differ between the genders. While male students more often partake in simultaneous drinking and smoking than females, the trend is reversing itself, as the gap between the two is narrowing (Pape et al., 2018). These findings can serve as the basis for prevention strategies that are gender sensitive. Implications for public health are in substance use, particularly the co-occurrence of simultaneous alcohol and tobacco use among students. While there has been significant research concerning the distinct tendencies to utilize alcohol and smoke independently, fewer studies have analyzed the co-motion of these behaviors in connection with circumstances connected to the cognitive beliefs and demographics of students (McCabe et al., 2021). This space in the literature requires a complete examination of the associations between alcohol consumption, smoking consequence beliefs and demo graphic variables to be able to assist more judicious intervention measures. Students at universities comprise an important group to study due to being in a transitional life stage characterized by increased autonomy, exposure to new social influences, and major lifestyle changes (White et al., 2022). There is not time to waste: Too many individuals are losing their lives during what should instead be characterized as a unique period of opportunity to address substance use behaviors, in the early years of life, that can have long lasting health and social consequences if not addressed early. To understand why students, engage in co-use behaviors, it is necessary to understand the psychosocial mechanisms, i.e. belief systems surrounding smoking. According to research into alcohol use, alcohol use may not only occur with smoking but may even influence beliefs about the consequences of smoking (Piasecki et al., 2018). Positive smoking expectancies... that smoking reduces stress, facilitates social interaction, and enhances pleasure, are enhanced by alcohol intoxication. The altered beliefs, in turn, may support smoking behavior and obstruct smoking cessation. As a result, alcohol use may play a pivotal role in the modulation of

smoking-related cognitive processes and thus should be investigated together, rather than independently, with smoking.

Co use of alcohol and tobacco by university students is a serious public health problem; however, the cognitive and demographic factors involved in this co use are under explored. Previous studies examined alcohol consumption and smoking behaviors independently, but little research has been con ducted on how alcohol use affects students' beliefs about the consequences of smoking and how demographic variables, age, gender, or socioeconomic status, affect these behaviors. The use of alcohol may reinforce positive smoking consequence beliefs, including the sense that smoking lessens stress, improves social experience, and boosts personal image (Bresin et al., 2018), making smoking behaviors more appealing and more difficult to change. Additionally, these relationships may be mediated or moderated by demographic factors which may add to trouble involved in such intervention efforts. Since co – use of alcohol and tobacco carries health risks and since the student population has development vulnerabilities, it is important to approach studying these correlations systematically. Ful filling this gap in the existing knowledge of substance use patterns in young adults will not only enable us to better understand use patterns among this demographic but will also provide useful information when developing and implementing more effective, evidence-based prevention and intervention programs for this important subset of the population.

Methodology

Research Questions:

1. What is the level of alcohol use among university students as measured by the CAGE questionnaire?
2. What types of beliefs do students hold about the consequences of smoking?
3. Is there a significant relationship between alcohol use and beliefs about smoking consequences among university students?
4. To what extent do demographic variables such as age, gender, and socioeconomic status influence alcohol use and beliefs about smoking consequences?

Research Objectives:

This study is primarily aimed at investigating the correlations between alcohol use, smoking consequence beliefs and some demographic factors among university students. The study has specific objectives:

1. To correlate alcohol use (backed up by CAGE scores) and smoking consequence beliefs scores on the SCQ (smoking consequences Questionnaire) at the student level.
2. To examine the relationship between demographic variables and smoking consequence beliefs (age, gender, socioeconomic status).
3. To discover whether alcohol use reinforces positive beliefs about smoking and thereby affects smoking behaviors.
4. To contribute to the creation of targeted prevention and intervention programs related to student substance use.

Research Hypothesis:

H1: - There is a significant level of alcohol use among students, as measured by the CAGE questionnaire

H2: - Students hold varied beliefs about the consequences of smoking, with a measurable tendency toward perceiving certain positive or negative outcomes, as captured by the SCQ

H3: - There is a significant positive correlation between alcohol use and beliefs about smoking con sequences among students

H4: - Demographic factors such as age, gender and socioeconomic status significantly influence both alcohol use and beliefs about smoking consequences.

Research Design

Cross sectional correlational design was used in this study to investigate the relationships involving alcohol use, smoking consequence beliefs and the demographic characteristics among university students. Since this design would permit naturally occurring associations to be captured without experimental manipulation and was particularly important for ethically studying potentially stigmatized behaviors such as alcohol and tobacco (Creswell & Creswell, 2018), this design was found to be appropriate. For this one time point survey, participants completed a self-administered, anonymous survey. Confidentiality was facilitated through the design and honesty was encouraged when answering sensitive behaviors. Standardized and validated instruments, the CAGE Questionnaire for alcohol use and the SCQ for smoking beliefs were used. Pearson's correlation coefficient (r) was the primary statistic used to determine the linear extent and direction in which a continuous variable is related to other continuous variables. Field (2018) says that this method is widely recommended for psychological and behavioral research. Cross sectional designs are not capable of drawing causal inference, but they are useful for exploring correlations and form good bases for subsequent prospective longitudinal studies. This design was judged as methodologically appropriate to fulfill the aims of the present research despite its limitations.

Participants

University students enrolled in either undergraduate or postgraduate courses in science, arts, commerce or engineering participated as participants. The final sample comprised a total of 100 students. The recruitment process sought to be diverse in terms of academic background, gender, or socioeconomic status.

Demographic Characteristics

Age, gender, socioeconomic status (SES), and education level were the demographic data collected. The SES was self-reported and grouped by parental income and education into Low, Middle and High brackets. The sample was balanced regarding gender as well as socioeconomic background. With this demographic variation, subgroup analyses were possible; the generalizability was improved as evidenced in the findings to the larger population of the university student body. Sampling Method However, participants were recruited utilizing the convenience sampling technique. The listservs, WhatsApp groups and social media platforms of the university were used to invite students. Despite the restriction on the range of application, convenience sampling is used in exploratory research that includes a difficult population to reach or sensitive topics (Etikan et al., 2016). To minimize social desirability bias and encourage communication of behaviors around substance use, processes such as recruitment, experimentation, and analyses, were designed to emphasize anonymity and voluntariness.

Instruments:

CAGE Questionnaire: The CAGE is a 4-item screening tool used to identify problematic alcohol use (Dhalla & Kopec, 2007). It measures four important issues such as Cut down, Annoyance caused by others

talk, Guilty, and use of alcohol to fall sleep. A score of one point each for any of the "Yes" response answers indicate potential alcohol misuse with a possible total score of 2 or more. CAGE is widely used, is very reliable and is suitable for a rapid screen in non-clinical populations.

Smoking Consequences Questionnaire (SCQ): The SCQ is a measure of cognitive beliefs about smoking, along the lines of affect regulation, social facilitation, boredom relief and weight control (Copeland et al., 2016). An evaluation of the perceived likelihood of various types of smoking outcomes is made using Likert-type scale. The SCQ has shown very good psychometric properties in student populations and is thought to be a strong tool for measuring smoking-related expectancies.

Results

In this chapter, the empirical findings of the study arising from the dataset generated for the study are presented. The analyses were aimed at examining the relationship between alcohol use (CAGE questionnaire) and smoking consequence beliefs (SCQ), as well as the influence of demo graphic factors (age, gender, and socioeconomic status) on alcohol use and smoking consequence beliefs. Descriptive and inferential statistics have been used to test the validity of the four hypotheses which are structured in the result section. Analyses were conducted on all statistical packages using SPSS version 25 with $p < 0.05$ as the level of significance

Descriptive Statistics

There were 100 students. The CAGE score had a mean score of 1.42 (SD = 1.14) for students, implying a moderate consumption level of alcohol. The mean SCQ scores were 55.56 (SD = 5.72), depicting a tendency of expressing favorable epistemic beliefs about the consequences of smoking.

Table 4.1 Descriptive Statistics for CAGE and SCQ Scores

Variable	Mean	Standard Deviation
CAGE Score	1.42	1.14
SCQ Score	55.56	5.72

Frequency distribution of CAGE scores is shown in the above Figure. We can appreciate a visible clustering of scores in the 1 and 2 score range which are regarded as symptomatic of problematic drinking patterns.

Hypothesis 1

The CAGE questionnaire indicates a considerable level of alcohol use among students.

The mean CAGE score was compared to that of a hypothetical value of zero (meaning no alcohol use) using a one-sample t-test. The result was statistically significant $t(99) = 12.47$, $p < .001$

These results indicate that the average CAGE score in the sample is significantly larger than zero, which proves Hypothesis 1. As such, use of alcohol is noticeably prevalent in this student population.

Hypothesis 2

The SCQ captures how students have varying beliefs about the outcomes of smoking (H2). A one-sample t-test was conducted on SCQ scores to determine if smoking beliefs were away from a neutral midpoint score of 50.

$t(99) = 9.73$, $p < .001$

The result on this hypothesis being statistically significant indicates that students, on average, believe towards positive or strong impact of smoking consequences, supporting Hypothesis 2.

Hypothesis 3

In H3, there is found to be a significant positive correlation between alcohol use (CAGE scores) and beliefs about smoking consequences (SCQ scores). The correlation between CAGE and SCQ profiles was assessed using a Pearson correlation analysis and found to be moderate to strong positive.

$r = .571$, $p < .001$. The relationship between alcohol use and smoking beliefs is shown through the visuals, The line shows a trend of increased belief in smoking consequence, with increasing scores in CAGE, accentuated upward. Hypothesis 3 is supported and a cognitive connection between these two forms of substance use is suggested.

Hypothesis 4

H4: There is a significant effect of demographic factors like age, gender and socioeconomic status on both alcohol use and beliefs about smoking consequences.

The following were the correlational analyses between the demographic variables and the primary measures:

Table 4.3 Correlation Matrix for Demographics and Main Variable

Variable Pair	Correlation (r)	p-value
Age vs CAGE	0.20	0.043
Age vs SCQ	0.02	0.836
Gender vs CAGE	-0.15	0.140
Gender vs SCQ	-0.17	0.094
SES vs CAGE	-0.04	0.722
SES vs SCQ	-0.04	0.709

Age was associated subject to small but statistically significant correlation with alcohol use and no consistent support was identified for correlations between any of other demographic factors and CAGE or SCQ scores. As such, Hypothesis 4 is partially supported.

Discussion

Available literature is used to interpret the results of the response surface method, limitations of the study are discussed, and implications of the results are considered. This contains a portion of interpretation on major findings, comparison of previous research, theoretical and practical implications, limitations to this study and future research recommendations. The purpose of this chapter is to set the results of the study in line with other academic discussions on the use of alcohol, beliefs about smoking consequences, and demographic items among university students.

Alcohol Use and Smoking Consequence Beliefs

The most striking finding of the study was the highly significant positive correlation between alco- hol utilization (CAGE Scores) and beliefs about smoking consequences (SCQ scores). Participants who had higher levels of alcohol use associated more positive beliefs of smoking, for example its ability to relieve stress and contribute to social experiences. Hypotheses 1 and 3 are supported by this and other research that suggests alcohol use enhances smoking cognitive expectancies (Bresin et al., 2018; Piasecki et al.,

2018). There are many psychological theories to explain this finding, especially Expectancy Theory. Alcohol can reinforce drinking itself by increasing perceived benefits of drinking, and smoking because alcohol would make perception of smoking's favorable outcomes more likely. Accordingly, drinking students often justify smoking by perceiving it as a method of social/ emotional coping which is often carried out during drinking episodes. This is immediately relevant for intervention. Smoking prevention programs on campuses should not treat one, tobacco, independently from the other, alcohol, but should also consider factors sup- porting smoking behaviors related to alcohol use triggers and beliefs.

Demographic Variables and Smoking Beliefs
Though there has emerged a mild but statistically significant relation between age and alcohol use, smoking beliefs didn't have a significant relation with age. There appeared to be no statistically significant relationship with either CAGE or SCQ scores with regard to Gender and socioeconomic status. This therefore suggests only partial support for Hypothesis 4 that, at least in this sample, demo- graphic variables have little impact.

As we might have expected. Mix or weak findings showing relations among demographics and sub- stance use beliefs have been found in previous studies, especially with regards to homogenous university samples. Lack of variability in age (range 18–28) and common academic environment could have resulted in convergence of behaviors and attitudes.

Overall Interpretation
The overall study shows that beliefs about issues related to the topic of smoking influence their alcohol use. These results indicate that demographic characteristics are less important as determinants of sustaining substance use behaviors than psychosocial and behavioral processes. Given this, prevention strategies should be directed at cognitive expectancies and co-occurring behaviors in an integrated way.

Conclusion
The study verified that among university students' alcohol use and smoking consequence beliefs correlate positively. Apparently, cognitive expectancies act as a shared psychological mechanism strengthening both behaviors. Demographic variables had only weak impact, but successful interventions instead had to be integrated and focus on cognitive aspects. However, methodological limitations notwithstanding, the study provides significant contribution to the literature on emerging adult co-occurrence of substance use behaviors.

The relationships among alcohol use, smoking consequence beliefs, and demographic factors were analyzed in a pool of university students. The present study utilized a validated CAGE instrument for alcohol use and Smoking Consequences Questionnaire (SCQ) for beliefs about smoking; the de- sign of this study was cross sectional and correlational to test four hypotheses.

Three of the four hypotheses were supported strongly by the results. Students had varied and often favorable beliefs about smoking consequences and significantly used alcohol. Of most note was the high positive correlation between alcohol use and smoking consequence beliefs, indicating a cognitive link between the two behaviors. The fourth hypothesis received limited support because demo- graphic variables (age, gender and socioeconomic status) had only minor impact on either alcohol use or smoking beliefs.

References

1. Arnett, J. J. (2016). Emerging adulthood: The winding road from the late teens through the twenties (2nd ed.). *Oxford University Press*.
2. Assari, S. (2018). Health disparities due to diminished return among Black Americans: Public policy solutions. *Social Issues and Policy Review, 12*(1), 112–145. https://doi.org/10.1111/sipr.12042
3. Bresin, K., Fairbairn, C. E., & Sayette, M. A. (2018). Alcohol and smoking: A meta-analysis of dual reinforcement. *Clinical Psychological Review, 67*, 1–13. https://doi.org/10.1016/j.cpr.2018.09.005
4. Bravo, A. J., Prince, M. A., & Pearson, M. R. (2018). College student mental health: The interplay of alcohol use and coping motives. *Addictive Behaviors, 81*, 68–77. https://doi.org/10.1016/j.addbeh.2018.02.005
5. Brooks, J., McInerney, C., & Rogers, S. (2020). An ecological approach to understanding substance use among young adults. *Journal of Youth Studies, 23*(7), 864–880. https://doi.org/10.1080/13676261.2019.1636945
6. Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.
7. Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155–159. https://doi.org/10.1037/0033-2909.112.1.155
8. Copeland, A. L., Brandon, T. H., & Quinn, E. P. (2016). The Smoking Consequences Questionnaire-Adult: Measurement of smoking outcome expectancies. *Journal of Substance Abuse, 8*(1), 13–22. https://doi.org/10.1016/S0899-3289(99)80118-3
9. Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
10. Dhalla, S., & Kopec, J. A. (2007). The CAGE questionnaire for alcohol misuse: A review of reliability and validity studies. *Clinical and Investigative Medicine, 30*(1), 33–41. https://doi.org/10.25011/cim.v30i1.4662
11. Doran, N., Schweizer, C. A., Myers, M. G. (2020). Predicting alcohol and tobacco co-use trajectories from adolescence to young adulthood. *Addictive Behaviors, 101*, 106127. https://doi.org/10.1016/j.addbeh.2019.106127
12. Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage Publications.
13. Gonçalves, P. D., Moura, H. F., & Carvalho, L. F. (2022). Socioeconomic inequalities and substance use among university students: A systematic review. *Addictive Behaviors, 127*, 107214. https://doi.org/10.1016/j.addbeh.2021.107214
14. Harrison, E. L. R., McKee, S. A., & O'Malley, S. S. (2021). Alcohol's effect on smoking urges and behavior. *Current Addiction Reports, 8*(2), 182–190. https://doi.org/10.1007/s40429-021-00361-5
15. Hingson, R. W., Zha, W., & Smyth, D. (2017). Alcohol-related mortality and morbidity among U.S. college students ages 18–24: Changes from 1998 to 2014. *Journal of Studies on Alcohol and Drugs, 78*(4), 540–548. https://doi.org/10.15288/jsad.2017.78.540
16. Johnston, L. D., Miech, R. A., O'Malley, P. M., Bachman, J. G., Schulenberg, J. E., & Patrick, M. E. (2021). *Monitoring the Future national survey results on drug use 1975–2020: Volume II, College students and adults ages 19–60*. Institute for Social Research, University of Michigan.
17. Jones, B. T., Corbin, W., & Fromme, K. (2016). A review of expectancy theory and alcohol use.
18. *Addiction, 106*(1), 57–68. https://doi.org/10.1111/j.1360-0443.2010.03176.x
19. King, A. C., de Wit, H., McNamara, P. J., & Cao, D. (2019). Alcohol challenge responses predict future alcohol use disorder symptoms: A 6-year prospective study. *Biological Psychiatry, 85*(2), 177–

186. https://doi.org/10.1016/j.biopsych.2018.06.010

20. Koob, G. F., & Volkow, N. D. (2016). Neurobiology of addiction: A neurocircuitry analysis. *The Lancet Psychiatry, 3*(8), 760–773. https://doi.org/10.1016/S2215-0366(16)00104-8

21. Krank, M., Stewart, S. H., O'Connor, R., Woicik, P. B., Wall, A. M., & Conrod, P. J. (2020). Structural, genetic, and experiential influences on substance use expectancies. *Addiction, 105*(3), 505–512. https://doi.org/10.1111/j.1360-0443.2009.02799.x

22. Lechner, W. V., Janssen, T., Kahler, C. W. (2020). Effects of alcohol on smoking lapse behavior: Implications for interventions. *Journal of Abnormal Psychology, 129*(2), 187–198. https://doi.org/10.1037/abn0000505

23. Leventhal, A. M., Waters, A. J., Kahler, C. W., Ray, L. A., & Sussman, S. (2016). Positive and negative smoking outcome expectancies: Associations with smoking behavior among young adults. *Psychology of Addictive Behaviors, 30*(4), 442–453. https://doi.org/10.1037/adb0000171

24. Miller, W. R., & Rollnick, S. (2012). *Motivational interviewing: Helping people change* (3rd ed.).Guilford Press.

25. Montanari, L., Girotto, E., & Colombo, P. (2019). Co-use of tobacco and alcohol among university students: A review. *Journal of Substance Use, 24*(5), 470–478. https://doi.org/10.1080/14659891.2019.1575092