The Effects That Binge Drinking Alcohol Has On College Students

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Section 001

INTRODUCTION

Binge drinking is a frequent pattern of strong alcohol intake in a short period of time (Lannoy et al., 2021). Binge drinking is further defined as consuming five drinks for males and four drinks for females in about two hours. Drinking at this rate will raise blood alcohol concentration (BAC) by 0.08%. BAC is the amount of alcohol in a person's bloodstream. Binge drinking is most troublesome among college students (Pérez-García, 2022). In the United States, binge drinking is considered the number one public health problem for college students. About 44% of college students participate in binge drinking. Among college students, one in five students meet the standards for alcohol use disorder (AUD) (Pedrelli et al., 2015). Binge drinking usually peaks in the early twenties and starts to decrease later in adulthood. The peak age was earlier for males, ages 21-22. The peak age for females was 21-24 years old (Megan et al., 2017). The high rate of college students binge drinking is alarming because binge drinking causes multiple health problems.

One health problem that is the aftermath of binge drinking is the negative effects it has on the brain. Binge drinking negatively affects the brain because at age 18-25 the brain is still developing and is vulnerable to the toxic effects of alcohol. The brain is experiencing morphology and functional changes that improve its efficiency of the brain. When binge drinking occurs, it damages the brain permanently. This damage is irreversible. Binge drinking doesn't allow the brain to form or function properly. Binge drinking causes abnormalities specifically in the cortical and subcortical regions of the brain (Pérez-García, 2022). A long-term effect binge drinking has on the brain is poorer memory. A study was done to see the longitudinal effects binge drinking has on the hippocampus in college students. The hippocampus is located in the temporal lobe of the brain. It plays a significant role in learning and forming memory. This study used 146 freshman college students' brain MRI scans at the beginning of school, then 24 months later retook the MRI scans. Throughout the 24 months, alcohol use surveys were completed each month by the participants. The study showed that all drinking measures were directly related to a decline in the hippocampus. Since there was a decline in the hippocampus that directly affected memory. Binge drinking is associated with poorer memory because of the damage it does to the hippocampus (Meda et al., 2018).

Secondly, binge drinking is related to poorer mental health. A study examined the unhealthy behaviors among college students and the effects it has on mental health. The unhealthy behaviors it focused on were binge drinking, physical inactivity, consumption of fruit and vegetables, and lastly, cigarette and marijuana use. This study used data from the NCHA which is a national survey that assesses behaviors, attitudes, and health among college students in the United States. The researchers compared the NCHA results to the mental health diagnosis the students reported. The researchers found a high correlation between binge drinking and poorer mental health. They also found that alcohol is associated with greater rates of depression (Jao et al., 2019).

Lastly, binge drinking has directly affected all tissues in the body which then alters organ function. Acetaldehyde generation, adduct formation, mitochondrial injury, cell membrane perturbations, immune modulation, and oxidative stress are tissue and organ injuries that are caused by the direct consumption of alcohol. These injuries can cause fatality and are very serious health problems. Binge drinking targets specifically the gastrointestinal tract, liver, and pancreas. All three of these are most affected by binge drinking because they are directly exposed to alcohol when alcohol is consumed (Molina and Nelson, 2018).

Mortality is defined as the number of deaths. In 2020, binge drinking caused three million deaths which equates to 5% of all deaths worldwide. More specifically 8% of the deaths were male, and 3% of the deaths were female (White, 2020). Binge drinking is considered to be the third leading cause of preventable death in the United States. Since 1998, unintentional deaths of college students due to binge drinking have increased by 3% (Kelly-Weeder, Phillips, and Rounseville 2011).

Morbidity is the illness or disease caused by binge drinking. Binge drinking is proven to cause liver diseases like cirrhosis. Cirrhosis is excessive liver scarring that eventually causes liver failure and can be fatal. Additionally, high blood pressure, stroke, heart disease, and digestive problems are all diseases that are caused by binge drinking. Among binge drinkers, 35% of them will develop a liver disease (Osna, 2017).

Healthy People 2030 has set a goal to reduce the number of people who engage in binge drinking in the last 30 days. In order to achieve this goal Healthy People 2030

has suggested raising alcohol prices, restricting alcohol advertising and sales, screening, and brief intervention programs (Healthy People 2030).

Another Healthy People 2030 objective is to reduce the amount of motor vehicle crash deaths that involve drunk drivers. To reduce the number of drunk driving accidents resulting in death, Healthy People 2030 proposed to have sobriety checkpoints, mass media campaigns, and laws that revoke or suspend the licenses of people convicted of drunk driving. (Healthy People 2030)

THEORY

A theory is a systematic explanation of hypothesized relationships between variables (Wacker, 1998). The literature has addressed multiple theories in the health world that have been used to address binge drinking among college students. According to the literature, the three most common theories that have been used to address binge drinking among college students are the social-cognitive theory, the transtheoretical model, and lastly, the multi-theory model.

Social-Cognitive Theory

The social-cognitive theory (SCT) was established in 1986 by psychologist Albert Bandura. SCT describes how behavior, environment, and personal factors are all influenced by each other. The SCT aims to explain how people regulate behavior (Ozer, 2022). The journal *Perceptions of Binge Drinking as Problematic among College Students* recognizes the unhealthy relationship college students possess with alcohol. The objective of this study was to better understand the causes of this unhealthy, problematic relationship and to decrease binge drinking among college students. SCT was used as the theoretical framework. This particular study administered a survey regarding demographic, binge drinking, and open-ended related questions to students. The study exhibited that the social norm, binge drinking, and peer pressure from friends to drink is an expected behavior in college. The social norm and peer pressure lead to an increase in students participating in binge drinking. By partaking in binge drinking, students feel more accepted and as if they met the expectations of college. This illustrates Bandura's SCT concept that behavior, environment, and personal factors all influence each other (Wrye and Pruitt, 2017).

Transtheoretical Model

The transtheoretical model (TTM) is a health behavior model that contains five stages of readiness to change behavior. The five stages are; pre-contemplation, contemplation, preparation, action, and maintenance. A study was concluded to see college students' readiness to change their binge drinking behavior using the transtheoretical model as the theoretical framework. This study used 435 undergraduate students. A servery was administered that had questions related to binge drinking which assessed if the student had a problematic relationship with alcohol. It also asked about the willingness to change the behavior which showcased the pre-contemplation stage of TTM. Lastly, the survey asked demographic questions to categorize the students further. This study specifically wanted to see if students living on campus were more willing to change their behavior than students who live off campus. The results show that students living on campus are more likely to express a willingness to change their behavior of binge drinking. Out of all the participants, 16% of college students decided to participate in the contemplation stage. Of the 16% of students who decided to participate half of them successfully completed all the steps and decreased the amount of alcohol consumption or fully abstained from alcohol as a whole. Once followed through with all the steps the TTM can successfully change binge drinking (Griffin, 2013).

Multi-Theory Model

The multi-theory model of health behavior change (MTM) is a frugal theory that uses observation, experience, and cognition to change health behavior. This theory helps people believe that they can and will change (Sharma et al., 2021). This theory was proven to change the behavior of binge drinking according to the journal *Applying a New Theory to Alter Binge Drinking Behavior in College Students.* The goal of this study was to change binge drinking behavior. The study wanted the participant to change their behavior to be responsible drinkers or even to abstain fully from alcohol using the MTM. The first step of this theory is to initiate where one decides what they want to do about binge drinking; either stop drinking altogether or start responsibly drinking. Secondly,

self-efficacy is used to believe they can quit or drink responsibly. Lastly, then they change their environment. Changing their environment to where alcohol isn't readily available all the time and they aren't surrounded by people who are constantly binge drinking will help them successfully achieve their goals (Sharma et al., 2017).

INTRAPERSONAL

Intrapersonal factors are characteristics an individual portrays like; attitude, behavior, skills, demographics, personality, and knowledge. The journal *The Relationship Between Physical Activity and Binge Drinking Among College Students: A Qualitative Investigation* explains the relationship physical activity has with binge drinking in college students. The participants had to meet four specific criteria to be eligible for the study; they had to be a college student between the ages 18-24, they could not participate in a varsity athletic, they had to have binge drunk at least once in the past 30 days, and lastly, they had to meet the current aerobic physical activity recommendation of at least 75 minutes of vigorous physical activity or 150 minutes of moderate physical activity. Once the researchers chose the eligible participants, they met up for a focus group session where they discussed open-ended questions led by a moderator. The discussion was audio recorded, and a trained note-taker was actively taking notes while the participants were discussing the open-ended questions. After the researchers analyzed the data, they found a few intrapersonal factors that led the participants to be more physically active after a night of binge drinking. The study concluded that the participants engaged in more physical activity prior to or after binge drinking to offset the calories they consumed from the alcohol. Calorie consciousness was an intrapersonal factor that 74% of the participants believed in. Another intrapersonal level discussed was how working out would counteract the unhealthy effects of binge drinking. Lastly, more males used physical activity to manage a hangover whereas females used physical activity after binge drinking out of feeling guilty for participating in binge drinking (Dinger et al., 2018).

Demographics is statistical data about a population and the specific groups within the population like; gender, ethnicity, and current residency. Research shows that males

are more likely to binge drink than females. Caucasians have the highest rates of binge drinking. After Caucasians, the second highest rate of binge drinking is Hispanics then lastly, African Americans. Another demographic that this study researched was which residency impacted binge drinking more; living on or off campus. The study concluded that students who live away from home and off campus have higher binge drinking rates than students who live on campus. Lastly, students a part of greek life, a fraternity or sorority, have more prevalent rates of binge drinking than nonmembers of greek life (Mcbride et al. 2014).

INTERPERSONAL

    Interpersonal factors include an individual's social network like; family, friends, peers, coworkers, and social figures. Continuing with the same study *The Relationship Between Physical Activity and Binge Drinking Among College Students: A Qualitative Investigation* the participants reported engaging in physical activity and binge drinking with the same social circle. Both physical activity and binge drinking are viewed as social activities to be engaged in with friends (Dinger et al. 2018).

    Binge drinking is shown to have negative interpersonal interactions. A study showed that binge drinkers are twice more likely to get into arguments with their friends and participate in physical fights. College students who binge drink are three times as likely to miss class and twice as likely to perform poorly in academics (Krieger et al., 2018).

    Another interpersonal factor that affects binge drinking is social media. Social media platforms that are popular on college campuses have proven to exacerbate binge drinking. A study was completed with the goal of seeing the relationship between alcohol being in the foreground or background of a photo on social media in relation to drinking patterns. To see if sharing alcohol-related photos had any association with the frequency of drinking this study examined 128 college students' Instagram profiles. The researchers separated the photos into two categories, foreground and background, and then analyzed the self-reported frequency of drinking by the paticipants. The researchers determined an association between the two variables. Alcohol in the

foreground of the photo was more strongly related to binge drinking (Geusens and Beullens, 2021).

Lastly, another interpersonal factor that affects binge drinking is the relationship people have with their family members. Having a healthy relationship with your family is a very important interpersonal factor. A study was conducted to see the relationship family interactions have with the consumption of alcohol. To determine these results, 2,290 students filled out a cross-sectional survey. A cross-sectional survey is a type of observational study that looks at data in a certain population. This cross-sectional study observed college students as the population. The results determined that being a second child is associated with higher binge drinking rates. Mothers with low education and people who have bad relationships with their parents and siblings were also more likely to have higher rates of binge drinking (Moñino-García et al., 2019).

ORGANIZATIONAL, COMMUNITY, ENVIRONMENT, AND POLICY

The social-ecological model was discovered by Urie Bronfenbrenner in the late 1970s (Kilanowski, 2017). The social-ecological model explains the relationships between social and structural environments, individual practice, and lastly the health of an individual. To explain these relationships researchers look at the organizations, communities, environments, and policies to describe the interactions at each level (Baral et al., 2013). According to the literature, binge drinking among college students is exponentially high. In a nationwide study, it was shown that 40% of college students binge drink (Sharma, Knowlden, and Nahar, 2017).

Organizational

An organization that increases binge drinking is school. School is a main cause of stress for college students. Stress is defined as mind-body arousal that can fatigue the body system to the point of malfunction and cause disease. College students have to find coping mechanisms that help them deal with the stress they are under. A big coping mechanism college students have turned to to deal with stress is binge drinking. The American College Health Association (ACHA) surveys college students to measure health concerns like stress and binge drinking. In 2016, the ACHA reported 33.8% of

students were stressed. More than half of the respondents, 63% reported turning to binge drinking as their coping mechanism because of the stress (Marykrantz and Houghton, 2020).

Work is another organization that affects binge drinking among college students. About 57% of college students work while also being full-time students. A study was done to see the relationship hours worked had with binge drinking. A mailed-in survey was completed by 903 undergraduate students. After analyzing the data from the survey, the researchers concluded that working while in college was associated with binge drinking. Binge drinking was remarkably associated with working at least 20 hours or more a week (Miller et al., 2013).

Community

A community that sees unruly high trends of binge drinking among college students is greek life. Greek life like fraternities and sororities, are notoriously known for being sponsors of parties. Greek life an exclusive club that are predominantly for socializing. A study was done to see the relationship between greek life and binge drinking. The literature found that males in fraternities are more likely to binge drink than females in sororities or non-greek members. Students that live in greek housing are more likely to binge drink and participate in risky behavior than students living in any other housing. Greek life is proven to exacerbate alcohol problems because of the peer pressure that goes on within a greek organization. Greek organizations also increase binge drinking because often times the sorority or fraternity provides an environment for alcohol to be consumed (Raghav and Diette, 2022).

Another community that sees high binge drinking rates is collegiate athletes. Collegiate athletes experience higher rates of binge drinking than non-atheltes in college do. As the level of intensity for collegiate athletes go up so does the amount of alcohol consumption. A study was done to see the alcohol-related behaviors among varsity, club, intramural athletes, and nonathletes in college. The intramural athletic level binge drinks more than all the other athletic levels. Following the intramural athletic level then the second highest binge drinking rates are club athletes then varsity atheltes and

lastly, nonathletes. Intramural athletes had the highest reported blood alcohol concentration (BAC). Intramural athletes also reported binge drinking more frequently than any other group. Intramural athletes represent a higher binge drinking episode than any other athletic level or nonathlete (Barry et al., 2015).

Environment

Location is an environment that affects binge drinking in college students. Research shows that colleges located near drinking establishments like bars and clubs have higher rates of student binge drinkers. Binge drinking is very common in bars and clubs. Factors that increases binge drinking at bars or clubs are alcohol promotions or discounts. Lowering the prices or having deals encourages students to buy more alcohol and consume it (Cox et al., 2022).

Another location that affects binge drinking is if you live on campus or not. Most dormitories on campus have a resident assistant (RA) who are responsible for upholding the rules of the dormitory. Most colleges have a no alcohol policy in dormitories on campus, so RA's are responsible for reporting students that don't abide by the rules and drink alcohol or have alcohol in their dormitory. Living on campus in a dormitory is less likely to binge drink than living off campus. It is proven that students who live off campus have higher rates of binge drinking. Also if you live in a greek life house like a sorority or fraternity house that was also proven to have higher rates of binge drinking (Ranker and Lipson, 2022).

Policy Factors

Policy factor includes all policies and laws that may impact binge drinking (Dinger et al., 2018). Several policies have been put in place to decrease binge drinking among college students. One policy at the national level that decreases binge drinking among college students is the legal age limit to purchase and consume alcohol, the minimum legal drinking age (MLDA). In the United States, the MLDA is at least 21 years old to purchase and consume alcohol. This policy reduced the rates of binge drinking. The MLDA also was effective in decreasing the number of fatal car crashes due to drinking and driving.

Another policy that decreased binge drinking was the legal blood alcohol concentration (BAC) to drive. It is illegal in the United States for people above the age of 21 to have a BAC higher than 0.08%. This law reduced the rates of alcohol car crashes, fatalities, and injuries by 5%-16%. For drivers under the age of 21, there is a zero-tolerance law for driving under the influence. To be under the age of 21, your BAC must be no higher than 0.02%. This law indicated a 20% reduction rate in fatal crashes.

Lastly, a policy that decreases binge drinking is the price of alcohol and taxes on alcohol. Higher alcohol prices and taxes on alcohol are directly related to a lower frequency of drinking. Some people aren't willing to afford the extra money it costs or can't afford it so raising the prices and taxes will decrease binge drinking. Limiting the number of days alcohol can be sold also was shown to decline binge drinking. Limiting the number of days alcohol can be sold limits the availability of alcohol to people. (Kelly-Weeder et al., 2011).

SUGGESTIONS FOR INTERVENTION

The population at risk for binge drinking used to be adults. Now that the problematic population has transitioned to adolescents and young adults its imperative to focus on targeting that age group. The age group that should be targeted is 18-25 years old. For the greatest results, interventions should aim to intercept before the first attempt with alcohol. The United States should gear alcohol prevention programs to school-age groups (Kelly-Weeder et al., 2011).

An intervention that has proven to be successful is contemporary educational programs. Contemporary educational programs educate students on how to handle peer pressure, decision-making, and problem-solving skills. This program also incorporates correcting misperceptions of normal alcohol use. The contemporary educational program has been shown to have a long-term effect on students (Kelly-Weeder et al., 2011).

School-based programming that focuses on teacher-delivered, personality-targeted intervention in a high-risk group is also proven effective. A school-based program that meets that criteria have a 40% decline in alcohol consumption and a 55% reduction in binge drinking. A national analysis of community,

schools, and youth intervention programs concluded characteristics that were shown to be most effective in intervention programs. Characteristics that have proven most successful in interventions are having a strong behavioral component, the utilization of introspective learning, and a connection built between instructor and students. Another factor that made an intervention successful was meeting for a minimum of three hours a week. Focusing on a consistent theoretical framework taught by a well-trained and qualified teacher was proven to be worthwhile (Kelly-Weeder et al., 2011).

Specifically, in college students, individual interventions have been proven to be the most effective. Brief motivational techniques, decision evaluation training, and norm assessments are the most effective individual interventions for college students (Kelly-Weeder et al., 2011). The brief motivational technique is a favored technique among college students. Brief motivational techniques are a type of motivational interviewing that is directive and client-centered. This motivational interviewing allows for college students to think about the interpersonal relationships that are causing them to binge drink and help them achieve their goal of abstaining from alcohol or responsibily drinking (Rollnick and Miller, 2015).

An intervention that was proven successful in other countries and should be suggested to the United States is sobriety checkpoints. Sobriety checkpoints is randomly being stopped by an office to see if the patron is sober. In the United States, sobriety checkpoints can only happen if an officer has suspected that a driver is impaired. Once suspected a driver is impaired an officer can then administer a breath test to determine how much alcohol the patron has consumed. In other countries, sobriety checkpoints can be administered at random. This increases the fear and risk of arrest. Since the fear and risk of arrest are heightened it directly diminishes the amount of consumption of alcohol because the patrons don't want to get in trouble. If the United States implemented random sobriety checkpoints as an intervention binge drinking rates would decrease significantly (Kelly-Weeder et al., 2011).

REFERENCES

Baral, S., Logie, C. H., Grosso, A., Wirtz, A. L., & Beyrer, C. (2013). Modified social ecological model: a tool to guide the assessment of the risks and risk contexts of HIV epidemics. *BMC Public Health, 13*(1), 482. 10.1186/1471-2458-13-482

Barry, A. E., Howell, S. M., Riplinger, A., & Piazza-Gardner, A. (2015). Alcohol Use among College Athletes: Do Intercollegiate, Club, or Intramural Student Athletes Drink Differently? *Substance use & Misuse, 50*(3), 302-307. 10.3109/10826084.2014.977398

Cox, M. J., Moskwiak, M., Chaney, B. H., & Garrigues, M. (2022). Natural Observation of Alcohol Price and Promotions at Bars: Implications for Alcohol Misuse Prevention. *Health Education & Behavior, 49*(2), 256-264. 10.1177/10901981211054783

Dinger, M. K., Brittain, D. R., O'Mara, H. M., Peterson, B. M., Hall, K. C., Hadley, M. K., & Sharp, T. A. (2018). The Relationship Between Physical Activity and Binge Drinking Among College Students: A Qualitative Investigation. *American Journal of Health Education, 49*(1), 33-39. 10.1080/19325037.2017.1369198

Geusens, F., & Beullens, K. (2021). Perceptions surpass reality: Self-reported alcohol-related communication on Instagram is more strongly related with frequency of alcohol consumption and binge drinking than actual alcohol-related communication. *Drug and Alcohol Dependence, 227*, 109004. 10.1016/j.drugalcdep.2021.109004

Jao, N. C., Robinson, L. D., Kelly, P. J., Ciecierski, C. C., & Hitsman, B. (2019).

Unhealthy behavior clustering and mental health status in United States college

students. *Journal of American College Health, 67*(8), 790-800.

10.1080/07448481.2018.1515744

Kelly-Weeder, S., Phillips, K., & Rounseville, S. (2011). Effectiveness of public

health programs for decreasing alcohol consumption. *Patient Intelligence,*

2011(3), 29-38. 10.2147/PI.S12431

Kilanowski, J. F. (2017). Breadth of the Socio-Ecological Model. *Journal of*

Agromedicine, 22(4), 295-297. 10.1080/1059924X.2017.1358971

Krieger, H., Young, C. M., Anthenien, A. M., & Neighbors, C. (2018). The

Epidemiology of Binge Drinking Among College-Age Individuals in the United

States. *Alcohol Research, 39*(1), 23-30.

https://www.ncbi.nlm.nih.gov/pubmed/30557145

Lannoy, S., Baggio, S., Heeren, A., Dormal, V., Maurage, P., & Billieux, J. (2021).

What is binge drinking? Insights from a network perspective. *Addictive*

Behaviors, 117, 106848. 10.1016/j.addbeh.2021.106848

Maykrantz, S. A., & Houghton, J. D. (2020). Self-leadership and stress among

college students: Examining the moderating role of coping skills†. *Journal of*

American College Health, 68(1), 89-96. 10.1080/07448481.2018.1515759

McBride, N. M., Barrett, B., Moore, K. A., & Schonfeld, L. (2014). The Role of

Positive Alcohol Expectancies in Underage Binge Drinking Among College

Students. *Journal of American College Health, 62*(6), 370-379.

10.1080/07448481.2014.907297

Meda, S. A., Hawkins, K. A., Dager, A. D., Tennen, H., Khadka, S., Austad, C. S.,

Wood, R. M., Raskin, S., Fallahi, C. R., & Pearlson, G. D. (2018). Longitudinal

Effects of Alcohol Consumption on the Hippocampus and Parahippocampus in

College Students. *Biological Psychiatry : Cognitive Neuroscience and

Neuroimaging, 3*(7), 610-617. 10.1016/j.bpsc.2018.02.006

Megan, E. P., & Yvonne M Terry-McElrath. (2019). Prevalence of High-Intensity

Drinking from Adolescence through Young Adulthood: National Data from

2016-2017. *Subst�Abuse, 13*, 1178221818822976.

10.1177/1178221818822976

Miller, K., Danner, F., & Staten, R. (2013). Relationship of Work Hours With

Selected Health Behaviors and Academic Progress Among a College Student

Cohort. *Journal of American College Health, 56*(6), 675-679.

10.3200/JACH.56.6.675-679

Molina, P. E., & Nelson, S. (2018). Binge Drinking's Effects on the Body. *Alcohol

Research, 39*(1), 99-109. https://www.ncbi.nlm.nih.gov/pubmed/30557153

Moñino-García, M., Adoamnei, E., Gadea-Nicolás, A., Arense-Gonzalo, J.,

López-Espín, J. J., & Torres-Cantero, A. (2019). Family environmental factors

associated with underage drinking. *Journal of Substance Use, 24*(1), 110-116.

10.1080/14659891.2018.1523965

Osna, N. A., Donohue, J., Terrence M, & Kharbanda, K. K. (2017). Alcoholic Liver

Disease: Pathogenesis and Current Management. *Alcohol Research : Current

Reviews, 38*(2), 147-161. https://www.ncbi.nlm.nih.gov/pubmed/28988570

Ozer, E. M. (2022). Albert Bandura (1925–2021). *American Psychologist, 77*(3),

483-484. 10.1037/amp0000981

Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College Students:

Mental Health Problems and Treatment Considerations. *Academic Psychiatry,

39*(5), 503-511. 10.1007/s40596-014-0205-9

Pérez-García, J. M., Suárez-Suárez, S., Doallo, S., & Cadaveira, F. (2022). Effects

of binge drinking during adolescence and emerging adulthood on the brain: A

systematic review of neuroimaging studies. *Neuroscience & Biobehavioral

Reviews, 137*, 104637. 10.1016/j.neubiorev.2022.104637

Raghav, M., & Diette, T. M. (2022). Greek myth or fact? The role of Greek houses in

alcohol and drug violations on American campuses. *Applied Economics,

54*(55), 6406-6417. 10.1080/00036846.2022.2064420

Ranker, L. R., & Lipson, S. K. (2022). Prevalence of heavy episodic drinking and

alcohol use disorder diagnosis among US college students: Results from the

national Healthy Minds Study. *Addictive Behaviors, 135*, N.PAG.

10.1016/j.addbeh.2022.107452

Rollnick, S., & Miller, W. R. (1995). What is Motivational Interviewing? *Behavioural

and Cognitive Psychotherapy, 23*(4), 325-334. 10.1017/S135246580001643X

Sharma, M., Chandra, A., Toth, R., & Nahar, V. K. (2021). Utility of Multi-Theory

    Model (MTM) to Explain the Intention for PAP Adherence in Newly Diagnosed

    Sleep Apnea Patients. *Nature and Science of Sleep, 13*, 263-271.

    10.2147/NSS.S294183

Sharma, M., Knowlden, A., & Nahar, V. (2017a). Applying a New Theory to Alter

    Binge Drinking Behavior in College Students.*Family & Community Health,*

    40(1), 52-55. 10.1097/FCH.0000000000000136

Sharma, M., Knowlden, A., & Nahar, V. (2017b). Applying a New Theory to Alter

    Binge Drinking Behavior in College Students.*Family & Community Health,*

    40(1), 52-55. 10.1097/FCH.0000000000000136

Wacker, J. G. (1998). A definition of theory: research guidelines for different

    theory-building research methods in operations management. *Journal of*

    Operations Management, 16(4), 361-385. 10.1016/S0272-6963(98)00019-9

White, A. M. (2020). Gender differences in the epidemiology of alcohol use and

    related harms in the United States. *Alcohol Research, 40*(2), 1.

    10.35946/ARCR.V40.2.01

Wrye, B. A. E., & Pruitt, C. L. (2017). Perceptions of Binge Drinking as Problematic

    among College Students. *Journal of Alcohol and Drug Education, 61*(1), 71-90.

    https://www.jstor.org/stable/48511423