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Caffeine

“The Silent Drug”

BHP Capstone



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Introduction

When you think of caffeine, what comes to mind? For many, caffeine means coffee, energy drinks, and fountain soda, each based on taste and purpose (energy or enjoyment). Regulations are mere guidelines for young adults, and the perception of caffeine, at least indicated by the acceptance on my own college campus, is a positive component of society. Understanding what is inside the drinks we consume and incorporate within our diets is something that is important yet is not encouraged. An example of this would be the GrubHub app that is utilized on campus. There is no indication of the amount of caffeine (only calories) within the drinks. These drinks range from regular coffee to double espresso and several other varieties.

There is a clear and significant growth in the popularity and consumption of caffeine and other means of stimulating your brain (prework, energy bars, and drinks). Individuals utilize caffeine to fuel their productivity, give them energy, or for the purpose of symbolism otherwise known as image enhancement. Caffeine is a supplement that has been socially constructed, through the association with college life, work stressors, culture and a desire to meet expectations. This social construction can be seen with caffeine supplements being viewed as a source of newfound energy and the idea that an individual can rely on it instead of sleeping. With these stigmas attached to caffeine, I want to delve deeper into this possible health crisis.

For comparison to another drug, we can look at tobacco and how this drug was utilized by many to lose weight and had the freedom to smoke practically anywhere. However, years later it was discovered that smoking causes lung cancer, birth defects, and many other health problems. This positive stigma that was attached to smoking both enabled and encouraged the

usage of this social drug, to the point where it caused irreversible damage to many who could not recover. Since smoking is now stigmatized as a dangerous drug, it is not utilized by many as there have been countless public awareness campaigns that continue to be streamed to this day. Rider is both a dry, other than the designated pub, and non-smoking campus, yet there are two coffee shops on campus. With the limited and overall positive stigmatization of caffeine, individuals are less likely to both understand the negative consequences of caffeine and consume a variety of such substances.

The consumption of caffeine has skyrocketed percentagewise among young adults. The CDC gathered that “Roughly 80% of U.S. adults consume caffeine every day” (2020) from a study conducted through the FDA. The idea of caffeine being a stimulant is important to keep in mind when we are analyzing how college students interact with caffeine and stigmatize it. We look at Monster (who advertise on college campuses), Starbucks or any coffee shop (we have two on Rider’s campus), and other factors like pre-workout or energy bars. There is an overwhelming pressure of incorporating caffeine within both social interactions (getting coffee) or even working out or focusing (pre-workout or energy drink). By regulation standards, each of these drinks is within the healthy limit of caffeine consumption per day, if the labeling and disclosure of ingredients are correct. Brands have their own undisclosed proprietary blends of ingredients, meaning they do not have to disclose specific amounts of ingredients within blends. Another labeling loophole is exposed by numerous manufacturers, as they can either be considered beverages or dietary supplements, meaning the amount of ingredients are not regulated by the FDA. “For healthy adults, the FDA has cited 400 milligrams a day—that's about four or five cups of coffee—as an amount not generally associated with dangerous,

negative effects.” (FDA, 2018) This is dependent upon other components within the substance, the sensitivity level of the individual and how fast they metabolize it.

Caffeine is something that lacks enforced and effective regulations and restrictions which creates a lack of framework for individuals to stigmatize. Wording, stigmatization, and social discussion are not yet formulated. Because caffeine is not an illegal substance, it can be marketed openly on social media directly to the populace, which allows those that want to buy these high-caffeine pre-workout or energy drinks. The FDA is limited in its actions as these substances are being marketed as dietary supplements and are not being regulated through stores and other places of purchase, they are operating through streaming platforms like TikTok, Instagram, and Snapchat directly with the young adults. The usage of streaming platforms is a very modern problem because unlike alcohol or even just a few years ago marijuana, neither of these products could be marketed openly on a platform that is utilized by millions of people. Caffeine supplements are marketed on these platforms with minimal restrictions and to the point where it is an issue and health crisis as these products are not regulated by FDA. Accessibility to social media creates a different marketing and transaction compared to a commercial on television because one is not able to instantly buy the product without having to verify ID. The FDA has limited power to stop these transactions from happening because they are almost instantaneous and are operating within the regulation that they set even though these have loopholes that are being manipulated by the manufacturers.

Caffeine is integrated within our social norms and culture as a feel good and energizing drink. Stigmatization is a factor of how society views a drug. By evaluating the level of stigma in which individuals categorize this drug, we can see if there is a relationship between consumption, perception and the level of scrutiny a drug endures. The purpose of this study is to

contrast students' views on caffeine with similar views of more stigmatized substance (i.e. nicotine, alcohol, etc.). Asking, why do college students feel the need to utilize caffeine to the point where it affects them (withdrawal)? I want to discover if there is any relationship between pressures that they are under from peers or family members, lack of sleep, lifestyle, which could lead to an increase of consumption/ frequency of usage. As a college student, I see individuals daily consume caffeine for reasons varying from grabbing a cup of coffee with a friend or being the necessary accessory for pulling an all-nighter. I want to better understand both the literature and regulations surrounding caffeine, so that I may uncover why a drug that is scientifically proven to cause physical dependence is regulated as minimally as it is and accepted with a positive stigma. Furthermore, I want to examine the line that society has constructed concerning the intake of caffeine and how it compares to other drugs or habits that exist in modern society.

This line is not clear between social interaction and the consumption of caffeine. Considering this misconception, I am making this argument to better understand the level of awareness, the stigma associated with caffeine consumption and how individuals obtain their caffeine. Discovering the numerous perceptions of caffeine within society is crucial to correlations with caffeine consumption. According to a study conducted in Pakistan with 670 students "Perceptions for consuming caffeine were feeling of alertness, experiencing caffeine withdrawal symptoms, feeling of energy and ability to work over long periods of time after having caffeine. The perceptions for not consuming caffeine were irregular heartbeat, bad feelings, irritability, and sleep disturbances" (Zahra et al. 2021). This shows that individuals are aware of the effects of caffeine yet will still consume this substance for the purposes listed above and will suffer the consequences. According to the National Institutes of Health (NIH) , "Drinkers who mix alcohol with energy drinks are more likely than drinkers who do not mix

alcohol with energy drinks to report unwanted or unprotected sex, driving drunk or riding with a driver who was intoxicated, or sustaining alcohol-related injuries.”(2018). This is a very relevant statistic concerning how an individual functions in the public eye. Since the individuals are able to act on their drunken thoughts with caffeine it enables them to put others in danger and break laws concerning the safety of others and themselves. There is accessible information for the public, yet upon living as a college student I feel we do not think about the negatives of caffeine. This is based both on the regulation perspective and the socially constructive narrative that is at play.

Furthermore, there is a lack of public awareness for caffeine like there is for tobacco, alcohol and even vape, there is minimal to no social discussion occurring within the bounds of college. I want to uncover the “why” of this through my survey and delve deeper than just statistics. Looking at how society has stigmatized caffeine, I will compare caffeine to tobacco, alcohol, and vape/E-cigs. These are all considered social drugs that have their own culture surrounding them. All these drugs are regulated in some fashion, however, the way we think about it is not the same. Considering this, we can better understand the full spectrum of how caffeine is utilized and viewed within society, or at least individuals ranging from 18 - 24; as that will be my projected audience for this study. This study plans on exposing the true impact and grasp in which caffeine has on individuals. I want to seek out if people are aware of the physiological and physical effects of caffeine as they are for tobacco and alcohol. Looking at tobacco, alcohol and even a more recent development vape, campaigns have been debuted to combat consumption and lack of awareness contributing to health issues. This study will serve to gather how individuals feel about caffeine, and the frequency of usage. Additionally, it will indicate the stigma in which individuals associate caffeine with, and their perceptions of the

distinctive styles of caffeine (energy drink, pre workout, energy bars, coffee, etc.). With all this I hope to reach a consensus of the possible mentality in which individuals of similar age to myself have concerning caffeine.

Caffeine is a drug that is not regulated like other social drugs, is not talked about in scientific discussions and has an addictive nature. The majority of the individuals with whom I interact with consume caffeine (more than once a day) to be productive and attentive for classes and exams. Gaining an understanding of how caffeine has been socially constructed by society to be seen as the “Silent Drug”, is the main reason for this study. Caffeine has the features and effects of a drug, is consumed in manners similar to other social drugs, yet is able to be marketed openly to the public with minimal restrictions and regulations. Awareness is a key component of this project, which will establish the extent of regulation knowledge and other impacting factors that are involved with the consumption of caffeine. Caffeine is a heavily marketed substance yet is rarely at the topic of mainstream debate like vape, tobacco or alcohol. The temptation of consuming caffeine is constant as I am surrounded by its numerous forms on a daily basis. This is a drug that is impacting our society, through the idea that it is an enhancer and allows consumers to engage and partake in activities that they otherwise wouldn't have the energy for. In a way caffeine is like putting a bandage over a deep wound and not addressing the main issue which could range from diet to the amount/quality of sleep they are getting. Coffee is one of the more known forms of caffeine, with it having its own culture attached to it. A prime example of this “so called” culture is the saying “Sorry for being rude, I haven't had my morning coffee yet”. This is why I want to examine how college students view and utilize caffeine, in addition to looking at the other factors that encourage the consumption of caffeine, like marketing, regulations and accessibility.

Literature Review

Sleep Effects of Caffeine:

Caffeine can have a negative impact on sleep, particularly when consumed close to bedtime or in large doses. For example, one study found that consuming caffeine six hours before bedtime reduced total sleep time by over an hour and increased sleep latency (time to fall asleep) by more than 20 minutes (Drake et al., 2013). Chronic caffeine use can disrupt sleep architecture, reducing the amount of slow-wave sleep and increasing the number of awakenings during the night (Bonnet & Arand, 2010). The mechanisms through which caffeine impacts sleep include its effects on adenosine receptors, melatonin secretion, and circadian rhythms (Landolt, 2008). It is known to block the action of adenosine, a neurotransmitter that promotes sleep and relaxation, by binding to its receptors in the brain (Landolt, 2019). By blocking adenosine receptors, caffeine can increase alertness and reduce the perception of fatigue. However, the effects of caffeine on sleep can vary depending on individual factors, such as caffeine sensitivity, dosage, and timing of consumption. It has been reported that caffeine consumption, particularly in the evening or close to bedtime, can delay sleep onset, reduce total sleep time, and decrease sleep efficiency (Landolt, 2019). These effects may be more pronounced in individuals who are more sensitive to caffeine or who consume caffeine in higher amounts.

Productivity:

This substance can increase alertness, attention, and focus, which can help individuals be more productive and efficient in completing tasks (Nehlig, 2010). Has the ability to improve cognitive performance. Studies have shown that caffeine can improve cognitive performance, including memory, reaction time, and problem-solving (Lieberman et al., 2002; Nehlig, 2010). This substance has been shown to increase motivation, which can help individuals tackle tasks

they might otherwise avoid or procrastinate on (Smith, 2002). Caffeine can reduce feelings of fatigue and increase feelings of energy, which can help individuals sustain their productivity over longer periods of time (Snel et al., 2013). However, it is important to note that the effects of caffeine on productivity can vary depending on individual differences, such as caffeine tolerance, metabolism, and sleep patterns. Additionally, excessive caffeine consumption or consumption close to bedtime can lead to negative effects on sleep quality, which can in turn impact productivity the next day (Smith, 2002). Overall, while caffeine can have positive effects on productivity in certain circumstances, it is important to use it judiciously and not rely on it as a sole means of enhancing productivity. It is also important to consider individual differences and factors such as timing and dosage of caffeine consumption when using caffeine to enhance productivity.

Productivity can be seen as how an individual interacts with the surrounding community. This gives an individual the ability to contribute to their role in society even if they are sleep deprived or under the influence of another substance. Caffeine is stigmatized as the helping hand within society, as it is there for when you need it most, however caffeine stimulates your brain and gives you “fake” energy, this can individuals the added boost to commit a crime or action that affects those around them. An example of this is driving drunk because they drank a monster and feel capable of driving. Another equally severe one is the commitment of sexual assault or harassment, due to the ability to act on their thoughts when in a state of intoxication. Caffeine is a substance that is positively looked at within society, yet it can be used in ways many are ignorant to the severity of the affects it can have and does have on society.

Cardiovascular Effects of Caffeine:

The cardiovascular effects of caffeine have been a topic of research interest. Studies have shown that caffeine can acutely increase heart rate and blood pressure, through its stimulant effect on the sympathetic nervous system (Kaplan et al., 2017; Nehlig et al., 2019). Caffeine stimulates the release of catecholamines, such as adrenaline, which can increase heart rate and contractility, and constrict blood vessels (James et al., 2017). However, the magnitude of these effects may vary depending on individual factors such as tolerance, sensitivity, and habitual caffeine consumption (James et al., 2017).

The effects on the body vary depending on the consumption rate, regular caffeine intake may lead to tolerance to its cardiovascular effects, with reduced heart rate and blood pressure responses over time (Nehlig et al., 2019). Excessive caffeine intake, particularly in susceptible individuals, may increase the risk of cardiovascular events, such as heart attack and stroke (James et al., 2017). The relationship between caffeine consumption and cardiovascular health is complex, and further research is needed to fully understand the underlying mechanisms and potential risks.

Metabolic Effects of Caffeine:

Caffeine has also been found to have metabolic effects on the body. It is known to stimulate thermogenesis, or the production of heat by the body, through its effect on sympathetic nervous system activity and increased metabolic rate (Astrup et al., 2019). This thermogenic effect of caffeine has been suggested to contribute to its potential role in weight management and as a component of some weight loss supplements.

Additionally, caffeine has been shown to have an impact on glucose metabolism. Studies have reported that caffeine can acutely increase blood glucose levels by enhancing glycogenolysis, the breakdown of glycogen to glucose, in the liver (Astrup et al., 2019). However, the long-term effects of caffeine on glucose metabolism are still debated, with some studies suggesting that habitual caffeine consumption may impair glucose tolerance and increase the risk of developing type 2 diabetes (Van Dijk et al., 2018). Further research is needed to elucidate the complex relationship between caffeine and glucose metabolism.

Mentality:

Caffeine has been shown to have both positive and negative effects on college students' mentality and cognitive performance. On the positive side, caffeine has been shown to enhance memory consolidation (Borota et al., 2014), increase attention and alertness (Einöther & Giesbrecht, 2013), and improve work performance (Turton et al., 2017). However, caffeine consumption can also lead to negative mental health outcomes such as increased stress and anxiety (Richards & Smith, 2015) and can disrupt sleep patterns (Bruno & Sarkar, 2013). It is important to note that the effects of caffeine can vary depending on individual differences, such as caffeine tolerance, metabolism, and sleep patterns. Additionally, excessive caffeine consumption or consumption close to bedtime can lead to negative effects on sleep quality, which can in turn impact cognitive performance and mental health the next day (Bruno & Sarkar, 2013).

Overall, while caffeine can have positive effects on cognitive performance and mentality in certain circumstances, it is important to use it judiciously and not rely on it as a sole means of enhancing cognitive performance and mental health. It is also important to consider individual

differences and factors such as timing and dosage of caffeine consumption when using caffeine to enhance cognitive performance and mental health.

Regulation:

Caffeine is not classified as a controlled substance by most regulatory bodies, and its regulation primarily revolves around its designation as a food ingredient. In the United States, the Food and Drug Administration (FDA) sets limits on caffeine content in certain beverages, such as cola drinks, but there are no federal regulations on caffeine content in coffee or energy drinks (FDA, 2018). Similarly, the European Food Safety Authority (EFSA) regulates caffeine as a food ingredient in the European Union (EFSA, 2015). However, some countries have imposed restrictions on caffeine content in certain products, such as energy drinks, and require warning labels on high-caffeine products (Gallus et al., 2015).

Coffee is regulated as a food product rather than a psychoactive substance. The production, distribution, and sale of coffee are subject to food safety regulations, including quality control and labeling requirements, to ensure its safety for consumption. However, there are no specific regulations on the caffeine content in coffee, and it is generally considered safe for consumption by most regulatory bodies (Matissek et al., 2018).

Hypothesis and Objectives

The objective of this study is to uncover whether there is a relationship between consumption of caffeine and the way in which the individual, speaking in general terms, understands caffeine. What is caffeine to individuals, how is it utilized and what makes it a drug that is admired and heavily praised by those who utilize it to substitute sleep or energy or just focusing. The purpose of this study is to understand how college students categorize caffeine

compared to other social drugs and uncover the reasons and motivators for consumption. Analyzing the distinctions between the social construction of caffeine and other social drugs like vape, tobacco and alcohol. By doing this I hope to discover possible correlations between regulation and stigma and understand the perceptions in which individuals have developed for caffeine compared to other drugs.

Methods

Study Design

A cross-sectional survey was conducted to collect data on attitudes surrounding the stigmatization of everyday products that individuals utilize including vape, alcohol, caffeine, coffee, tobacco. Additionally, this survey was to collect individuals' perceptions on each substance. Collecting data on usage/consumption, stigmatization and looking at how regulation affects individuals' attitudes.

Participants

The population was individuals between 17 and 26. The majority of the participants were between the ages of 18 and 20 and 21 through 25. The convenience sample was held at Rider University within all departments and was spread through the college campus by means of communication including email and Instagram and word of mouth. Total number of participants was 141 with 97 female, 38 males and 6 individuals who preferred not to say.

Survey Instrument

This survey questionnaire was developed based on a review of relevant literature and interest in stigmatization of the substance Caffeine. The questionnaire consisted of 13 sections: First section was the Cover letter. Second section was General Questions ex. Age, Amount of

sleep, Sex, etc. The rest of the survey was 2 parts for each substance: Alcohol, Vape/E-cigs, Coffee, Caffeine Supplements, and Tobacco. With a final section being the part where students could leave their email for possible interview or class credit. A pilot-test was conducted with a small sample of college students (n=10) to assess the clarity and comprehensibility of the questions, and minor revisions were made based on the feedback received.

Data Collection Procedure

The survey was conducted over a period of four weeks from March 22, 2023, to April 15, 2023. A cover letter explaining the purpose of the study, assuring confidentiality and voluntary participation, and providing instructions on how long the survey is expected to take. The survey was distributed using Google Forms and stored using Google Sheets and Excel. Utilized cross tabulations and chi-square tests, to discover any relationships between chosen variables. All data was analyzed using statistical software SPSS by IBM. The levels of significance was set at highly significant $p < .01$, significant $p = 0.01 - 0.05$ and partial significance $p = 0.05 - 0.1$.

Results

There are highly significant relationships between the use of Alcohol [$\chi^2 = 37.691(1)$; $p = <.001$], Vape [$\chi^2 = 14.121 (1)$; $p = <.001$], and Coffee [$\chi^2 = 19.837 (1)$; $p = <.001$] and whether individuals view these substances positively or negatively. A significant relationship [$\chi^2 = 4.677 (1)$; $p = .031$] was found between an individual's use of alcohol and whether or not the individual has role models who consume alcohol. Caffeine usage and whether or not the individuals has role models who use caffeine supplements showed a highly significant relationship [$\chi^2 = 6.934 (1)$; $p = .008$]. Additionally, there was a partial relationship between usage of tobacco and role models [$\chi^2 = 3.604 (1)$; $p = .058$]. No relationship was found between

Frequency of consumption of substances with FDA regulations. There were no significant relationships found between Usage of the substances with societal views, however, there were two partial relationships with Alcohol [$\chi^2 = 2.728$ (1); $p = .099$] and caffeine [$\chi^2 = 3.700$ (1); $p = .054$] within this comparison. There is no relationship between consumption of tobacco and individual perception of the drug. There were no relationships found between usage of the substances and whether or not the respondent felt public relation campaigns were effective. There was a highly significant relationship between frequency of usage of caffeine supplements and the individual's perceptiveness on the substance caffeine [$\chi^2 = 15.691$ (4); $p = .003$], no other relationship was found for this variable comparison. Another significant relationship was found between frequency of consumption of coffee and role models [$\chi^2 = 13.108$ (4); $p = .011$]. Knowledge of non-age regulations for both consumption and frequency of consumption showed no relationships.

Discussion

This study is different than the majority of the studies to which I had access, as it focuses more on stigmatization and regulations, the past studies focused more on consumption behaviors and emotions attached to consumption. There are a few notable findings from the conclusion of this study. Regulation and public relation campaigns do not impact caffeine and coffee. This is a vital finding for the reasons concerning policy and social acceptance. For social acceptance, there are no public relations campaigns for coffee or caffeine supplements, there is relatively only a positive stigma surrounding these two substances. Regulations as shown within the survey do not indicate a relationship, which supports the idea that even if policies and the FDA began to

enforce more regulations, individuals would likely still consume the substances of caffeine and coffee.

Public relations does not impact alcohol, but regulation has the potential to according to these findings. Public relations is shown to be considered ineffective in the eyes of the respondents of this survey for decreasing the usage of alcohol. Regulation on the other hand, was shown to cause individuals to view the substance in a more negative manner. Even with the negative stigmatization and the stricter regulations of alcohol compared to caffeine and coffee, it is still utilized heavily within our society. Furthermore, according to the National institute on alcohol abuse and alcoholism it is utilized at a elevated rate across college campuses due to the associated relation between partying and binge drinking. There is a clear distinct relationship with social views and coffee that is positive and there is no stigma attached to it.

For coffee, there is no significant relationship between consumption and regulation, however the relationship is partially significant between alcohol consumption and regulation. This leads me to believe that there is a potential indicator to the ways in which the substances are marketed and how exposed they are to individuals. To expand on this point, alcohol stores are not seen as a place to go with family and friends, nor are you able to enter them without being 21 and over. However, a Starbucks or a Dunkin are clearly places that are trafficked more frequently by both college students and families as they are marketed as a place that meets the needs of all age groups. This influence I feel is something that is supported and encouraged at a young age up to college age individuals.

There was a significant relationship between coffee consumption and whether or not an individual's role model consumes coffee. This is consistent with findings by Weatherford and DeMaria (2012) concerning consumption behaviors and were influenced by social norms, with

peer groups playing a critical role in shaping their attitudes towards caffeine. This indicates how environmental factors, especially mentor like relations can have a impact on consumption. Moreover, this can be seen with the social norm of drinking coffee, as it is considered a convenient way to meet up with friends. Most of the respondents 113/141 view coffee in a positive manner. Which is important to note when comparing this to alcohol, vape and caffeine. Results of this study found that usage can be influenced by the perception in which the individual sees the substance. These perceptions can be influenced by role models for alcohol, caffeine, and tobacco. One of the more notable findings from this survey was that societal views do not indicate a relationship between consumption. This lack of relationship is beneficial in terms of looking at how individuals answered the public relations questions. There are more individuals that do not use vape or tobacco that express a negative opinion of the public relation campaigns. I find this interesting because they indicate that these approaches to decreasing consumption are not effective, yet they are not using the product themselves.

A total of 132 participants do not consume tobacco and view it negatively, furthermore a total of 140 participants views the substance negatively. Even though it is not statistically significant all those that are noted as consuming the tobacco (n=8) marked that they view tobacco negatively. This is an interesting find since tobacco is the most regulated drug amongst the ones comparing within my survey. The stigmatization of this drug is noticed within the findings of this survey as there is a negative association with this substance. There are no relationships between many of these variables to the values being negatively centralized.

This study reveals significant differences in the stigma and regulation of caffeine compared to other substances, including alcohol, coffee, vape, and tobacco. Despite being widely consumed, caffeine is not subject to the same level of regulation or social stigma as other

substances. This disparity is particularly noteworthy given the potential health risks associated with excessive caffeine consumption, including increased risk of cardiovascular disease and other adverse health outcomes (Griffiths & Vernotica, 2015). There is a strong relationship between usage of caffeine supplements and role models, which is supportive that social relations influence the consumption of caffeine. Furthermore, there is a partial relationship between usage and societal acceptance, which can support how college campuses allow monster or other drink manufacturers to market on their campus, in addition to selling the products in the vending machine. This shown acceptance is a possible influencing factor on consumption rate of caffeine supplements.

In contrast, alcohol is subject to strict regulations and is widely recognized as a potentially dangerous substance, with campaigns warning against excessive consumption and driving under the influence (Giesbrecht, Wettlaufer, & Wechsler, 2003). Similarly, tobacco and vape products are subject to extensive regulations and are widely stigmatized due to their health risks and addictive potential (Ling & Glantz, 2002). Coffee, while also widely consumed, is not subject to the same level of scrutiny as caffeine, with few regulations and limited public health awareness.

The discrepancy in regulation and stigma between caffeine and other substances may be due in part to the widespread availability and social acceptability of caffeine. Unlike alcohol, tobacco, and vape products, caffeine is not associated with the same level of social harm or addiction potential and is viewed by many as a harmless or even beneficial substance (Tempelaar et al., 2011). However, this perception may be misguided, as excessive caffeine consumption has been linked to a range of negative health outcomes, including anxiety, insomnia, and increased risk of cardiovascular disease (Griffiths & Vernotica, 2015).

Given the potential health risks associated with caffeine consumption, I recommend that policymakers consider implementing more comprehensive regulations and public health campaigns to raise awareness about the risks of excessive caffeine consumption. This could include labeling requirements for caffeine content in food and beverages, public health campaigns to educate the public about safe caffeine consumption levels, and restrictions on the sale of high-caffeine products to minors. Even though public relations and regulations were shown not to be effective I do feel that bringing attention to the negative effects of caffeine is imperative before there is real change in both the societal perception of the substance but also the individual perception of caffeine.

Productivity, in the case of caffeine, is how an individual interacts with the surrounding community. This gives an individual the ability to contribute to their role in society even if they are sleep deprived or under the influence of another substance. Caffeine is stigmatized as the helping hand within society. However, caffeine stimulates your brain and gives you “fake” energy, which gives individuals the added boost to commit action that can affect those around them. An example of this is driving drunk because they drank a monster and feel capable of driving. Another equally severe one is the commitment of sexual assault or harassment, due to the ability to act on their thoughts when in a state of intoxication. Caffeine is a substance that is positively looked at within society, yet it can be used in a way that can change the lives of those around the individual. The purpose of this study was to compare the stigmas attached to each substance and see how regulation affects consumption and perceptions. Frequency of use compared to how an individual views caffeine supplements shows that if viewed negative the less frequent you consume them, and if you view them positively you are likely to drink them more often. However even though it is viewed negatively individuals still consume it, this could

possibly be due to influential factors including peer pressure or the way in which is marketed by others as either the “study buddy” or the “perfect chaser (mixed drink)”.

Overall, this study discovered that with certain substances (alcohol, vape, coffee and partially caffeine), individual perspectives impact usage. Additionally, role models can impact both usage and frequency of usage for alcohol, coffee, caffeine, and Tobacco. Caffeine and coffee and the more specific form of caffeine both have a positive stigma surrounding them within both societal views but also individual views. This enables caffeine to escape much of the scrutiny and regulations that other substances undergo. For this substance to become more regulated, education and attention need to be the priority. This substance as mentioned has benefits for individual’s health like increase metabolic activity and enhance performance however, looking past this for the sake of stigma, there are numerous side effects that can affect sleep, mental health and overall, over stimulation of the brain (loss focus rather than gain). There seems to be a blind understanding of the positive effects of caffeine and ignore the negative effects and pretend they do not occur. Withdrawal, insomnia, anxiety, and an altered circadian rhythm are just some of the side effects from over consuming caffeine. These symptoms you may notice are similar to the side effects of withdrawal from tobacco, vape, alcohol and even coffee. Caffeine is a substance that has been accepted by society and is being utilized heavily by the population, however there is a lack of awareness and knowledge surrounding the health effects. Caffeine has created its own culture within our society similar to the coffee culture, where it is praised for its ability to give you energy but leaves blemishes if you are not careful.

Limitations

My survey was constructed to assess consumption behaviors, emotions and how hours worked, or sleep quality could be impacted by it, however due to time limits I focused more on stigmatization and regulation to keep the criminal justice aspect. The limitations of the study surround the idea of both population and depth of the questions asked. To get a more in-depth understanding of the topic concerning stigma and regulation impact upon substance use, there is a need for more personalized data rather than quantitative data. Due to the time frame in which I allotted myself for this study, I found it difficult to capitalize on the willingness of the individuals for interviews. Another limitation of this study was the restriction to only one student body, expanding this across numerous college campuses would create a rich pool of data on stigma and knowledge of regulation can be statistically studied. Another limitation of this study was the inability to use the survey panels concerning utilization of vape and tobacco. Both of these panels were not statistically significant enough with vape having 17 respondents and tobacco having 8. The one way that this can be rectified is by canvassing more campuses or by offering an incentive. Another limitation is survey error with the absence of a question or two within certain panels. This inhibited the ability to contrast certain relationships. Additionally there was a significant difference between the number of females and males within this study. For this to be more statistically significant there needs to be a more balanced sample (current sample is predominantly female).

Recommendation

The next step that I would take with this study would be to take a more qualitative approach to the respondent's perceptions of the substance. This would include an interview,

where they would be asked questions concerning the formation of the stigmatization or lack of stigmatization of the substances. This I feel would give me as well as other researchers the ability to shape and construct a new survey that has more direct questions concerning stigmatization and environmental factors that could be influencing their perception. We found from this study that there is something there with the role models of individuals and the influence it has on consumption. I feel that this relation can be explored and broken down by distinct types of role models. I encourage that if this was to be replicated, I would not limit it to just college students. I feel that in order to understand the full extent of the influence of stigma and regulation the study must include all ages over the age of 18. One can look at the possible generational differences between how substances are viewed and look at past and present consumption rates.

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