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The Effects of Energy Drinks Consumption on Health and Performance of Undergraduates in Oyo State, Nigeria

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Abstract

Energy drinks (ED) refer to that category of carbonated beverage that is enhanced with caffeine, sugar and some vitamins. It is known to provide extra energy, attentiveness and can ameliorate deficits in cognitive performance and subjective fatigue during extended periods of cognitive demand. The trend of acceptability and consumption of this drinks among adolescents and young adults is phenomenal. When the increased consumption of ED is juxtaposed with the increased prevalence of diabetes, heart diseases, substance abuse and problematic behaviours, some relationship may be inferred. Many young people indulge in Alcohol mixing with Energy Drinks (AmED), heightened smoking habits, and substance abuse which had led to blood pressure and psychosocial challenges. The problem is made worse by the non-availability or scarce information on the pattern of consumption of ED. This study drew its samples from the population of students of higher institutions in Oyo State, a total of 150 undergraduates were selected. Data was gathered through internet surveys using a structured questionnaire. Data were analysed qualitatively. It was found that majority of the sampled respondents were male, aged 19–24 years, of Christian faith, Full-time student, live-alone, respondents' mothers and fathers being educated till the Tertiary level. The respondents consume energy drink more than once per day. The study revealed that there is adverse effect of energy drink on academic performance of sampled respondents. The physical effect of energy drink consumption in Oyo State institution was also negative. The social life of students who drink energy drink in Oyo State institutions is also negatively affected as they seem to be more introverted and withdrawn from social functions although they attend social gatherings. The emotions of students who consume energy drink is

unstable. Additionally, sampled respondents agreed that energy drink consumption leads to dependency and withdrawal, thus negatively affecting their psychology. It was recommended that Government should ensure regulate advertisement of energy drinks to involve the ingredients, benefits of consumption and available evidence of the negative consequences of over-usage. Pubic enlightenment programs through various mass media should be strengthened.

Keywords: Energy Drinks, Consumption, Health, Performance, Undergraduates.

Introduction

Japan debut with the introduction of energy drinks into the food market in 1960, followed by the Red Bull on the European market in 1987 (Zucconi, 2013). Malinauskas *et al.*, (2017) described energy drinks as beverages that contain caffeine, herbal extracts, B vitamins, amino acids (taurine), amino acid derivatives (carnitine), sugar derivatives (glucuronolactone), and sugars or sweeteners, among other ingredients (Zucconi, 2013). Energy drinks may contain from 70 mg to 400 mg/L caffeine (Zucconi, 2013). They are non-alcoholic carbonated beverages that could give consumers short term boost in energy and increase mental alertness (Alford *et al.,* 2021; Salaman, 2021; Brian, 2014). The unique contents of energy drinks are large dose of caffeine (three times that of cola) and glucose (over three times above recommended dose) can ameliorate deficits in cognitive performance and subjective fatigue during extended periods of cognitive demand (Warburton *et al.,* 2021; Smith *et al.,* 2014).

The rate of overweight and obesity have increased worldwide over the last three decades, and while genetic factors may play a part in the development of obesity, the recent dramatic increase in its rate suggests that environmental and behavioural factors have contributed to this problem (Egger and Swinburn, 2017). Lifestyle and diet changes are the most common culprits, but recent research has proposed that the added sugar content of beverages may play a considerable role in weight gain (Bray *et al.,* 2014). Energy drinks are most frequently used as energizers, stimulants, and performance enhancers (Bevnet 2017, U.S. Department of Health and Human Services and U.S. Department of Agriculture, 2017).

The side effects of energy drinks are attributed to their active ingredients such as caffeine, taurine, and glucuronolactone and their cumulated effect with other substances (Itany, 2014). Caffeine has numerous effects on the organism such as vasoconstriction due to antagonized adenosine receptors, increased basal

metabolic rate caused by the upregulated circulation of cathecolamines, and water and sodium secretion (Persad, 2021; Oprea *et al.*, 2019). Thus, energy drink consumption in excess may cause cardiovascular, neurological, psychological, gastrointestinal, metabolic, and renal diseases (Utter *et al.*, 2017; Bichler *et al.*, 2016; Shah, 2016; Alsunni, 2015; Lee *et al.*, 2015).

Higgins *et al.* (2020), posited that energy drink consumption can increase one's heart rate and blood pressure. Young adults tend to mix energy drinks with alcohol. Alcohol mixing with energy drink (AMED) poses potential risks of: increased total alcohol intake, masked intoxication effects and increased risk-taking behaviour (McKetin *et al.*, 2015; Verster, 2018; Benson *et al.*, 2019).

Consumers of energy drinks may be more at risk for alcohol-related driving accidents, binge drinking, and illicit drug use depending on the intersection of their identities (e.g., race, gender, undergraduate status). Arria *et al.* (2020), and Berger *et al.* (2021) found higher institution students who identified as white, male, and were involved in fraternities, sororities or intramural sports life on campus, were more likely to consume AmED. Miller (2018) found the problematic behaviors (e.g., impulsivity, increased risky sexual behaviors, risk-taking behaviors) and energy drink consumption relation is particularly strong among white participants, especially white men. Alarmingly, many energy drink companies suggest energy drinks will provide enhanced performance, mental alertness, and improved overall performance. Although the risks of engaging in negative behaviors are correlated with consuming energy drinks, the potential benefits have also been examined in this study.

Statement of the Problem

In Nigeria energy drinks enjoy patronage of adolescents and young adults, especially among students of University, Polytechnic and Colleges of Education. The steady increase in soft drinks and beverages consumption among adolescents and youths globally has raised a concern about the health effects of soft drinks and beverages. Unfortunately, there are no reliable statistics on the consumption pattern and effects of consuming energy drinks to inform health and safety policy. This gap in information availability and research findings on the health and cognitive impacts of the recent increase in energy drinks consumption was the thrust of this study. Among the issues of concern are: what is the trend of consumption of energy drinks? Who are the consumers of energy drinks in terms of race, ethnicity, gender and education levels? What are the benefits and common challenges associated with energy drinks consumption? This study was undertaken to determine the consumption pattern of commonly consumed energy drinks and their effects on undergraduates in Oyo State institutions.

Objectives of the Study

The main objective of the study was to determine the consumption pattern of energy drinks and the effects of consuming the product on undergraduates of institutions in Oyo State. Specifically, the study sought to;

i. determine the socio demographic characteristics of students who take energy drink in Oyo State institutions.
ii. examine the influence of energy drinks on students' academic performance of undergraduates in Oyo State, Nigeria.
iii. evaluate the relationship between energy drink intake and academic performance of undergraduates of higher institutions in Oyo State, Nigeria.
iv. examine the effect of energy drink consumption on the social life of students of higher institutions Oyo State, Nigeria.
v. assess the psychological effect of energy drinks consumption on undergraduates of institutions in Oyo State, Nigeria.

CONCEPTUAL AND EMPIRICAL CLARIFICATIONS

Energy Drinks

Energy drinks are beverages containing large amounts of caffeine and other stimulants, such as β-complex vitamins, carbohydrates, glucoronolactone, inositol, niacin, panthenol, and taurine (Reissig *et al.*, 2019). Caffeine, the most widely used drug in the world, is the most common ingredient in energy drinks (Rath, 2020). Hundreds of different brands of energy drinks exist, with a wide range of caffeine per can (e.g., 50 milligrams (mg) to 505 mg; Higgins *et al.*, 2020). Most energy drinks contain between 70 and 200 mg per 16 ounces, whereas other caffeinated beverages contain about 50 to 100 mg (Higgins *et al.*, 2020).

Conceptualizations of Substance Use

Even with an understanding of the consequences related to energy drink and alcohol consumption or other illicit drug use, individuals continue to consume excessive amounts ofeach, separate and combined. The sociocultural model of addiction conceptualizes reasons for beginning substance use and continuing use despite negative consequences from an environmental and cultural perspective (Becker, 1953). This theory was developed from the idea that first time substance users learn about the effects of substances from their more experienced peers. For example, individuals who live in a culture glorifying substance use and not showing the harmful components of it will be more likely to begin using substances.

Another theory of substance use is the self-medication model. The self-medication model is defined as individuals using substances to alleviate negative symptoms (Krystal *et al.*, 2019).

Comprehensive Review of the Effects of Energy Drinks

The United States is one of top consumers of energy drinks in the world. As a result, researchers, including O'Dea (2013), Ivy *et al.* (2019) and Mets *et al.* (2021), examined the motivations for and effects of energy drink consumption. Specifically, research has been conducted on the effects of energy drink ingredients and the drink as a whole. When caffeine is combined with glucose positive effects can occur. Researchers assessed mood and cognitive and physiological effects of energy drink ingredients. Scholey and Kennedy (2014) conducted a study assessing the effects of an energy drink containing glucose and caffeine on mood, cognition, and physiology. Participants who consumed the energy drink significantly improved performance on secondary memory factors, such as delayed word recognition, delayed picture recognition, delayed word recall, and immediate word recall.

Positive Effects of Energy Drink Consumption

The perceived benefits of energy drinks have been examined to better understand the increased consumption throughout the United States. A study conducted by O'Dea in 2013 included 78 adolescents in grades 7 to 11. Participants were assigned to focus groups and responded to a series of questions, including reasons for consumption of various supplements (i.e., vitamins and minerals, high protein milk formulas, herbal supplements, guarana coenzyme Q10, creatine, sports drinks, and energy drinks). The reasons for consumption of energy drinks endorsed by these adolescents included energy, taste, pressure from a peer group, attractive advertising and packaging, sports performance, and soft drink substitute. A majority of participants stated energy drinks made them feel more energetic and more alert (O'Dea, 2013).

Negative Effects of Energy Drink Consumption

Researchers and health professionals are concerned about the adverse effects of consuming energy drinks because of the amount of caffeine they contain. One of the more notable adverse effects of excessive consumption of energy drinks includes caffeine toxicity. Caffeine toxicity occurs when symptoms such as nervousness, anxiety, restlessness, gastrointestinal upset, tachycardia, insomnia, psychomotor agitation, and tremors arise as a result of excessive caffeine consumption (Reissig *et al.*, 2019).

The risk for caffeine toxicity appears to be greater for those who consume energy drinks than those who consume other caffeinated beverages. Energy drink companies are not required to display warning labels about proper use and often do not label their energy drink products with the amount of caffeine in the product. Additionally, advertisement of energy drinks often involves claims regarding enhanced performance after consumption; this claim is subject to debate (Reissig *et al.*, 2019), as caffeine

dependence and withdrawal are possible adverse consequences to consuming energy drinks on a regular basis. Reduction of or withdrawal from caffeine can result in emotional and physical symptoms, including headaches, fatigue, drowsiness, dysphoria, depression, difficulty concentrating, irritability, nausea, and muscle aches (Reissig *et al.*, 2019). As a result, many individuals may resort to maintaining or increasing their caffeine consumption to avoid these negative symptoms.

Association of Energy Drink Consumption and Substance Use

In addition to negative effects of energy drink consumption, licit and illicit substance use is linked to energy drink consumption. Higgins *et al.* (2020) reported energy drink consumption is positively associated with illicit drug use. Similarly, frequency of energy drink consumption is positively correlated with binge drinking and prescription drug misuse (Miller and Quigley, 2011). Istvan and Matarazzo (2004), along with Kozlowski *et al.* (2013), found individuals who consume large amounts of caffeine to be more likely to consume large amounts of alcohol. More recently, O'Brien *et al.* (2018) found that, of 496 college students surveyed, 27% reported mixing energy drinks and alcohol in the past month. A similar study conducted by Velazquez *et al.* (2022), surveyed 585 college students found alcohol use and heavy drinking increased by 80% and AmED use increased by 90% for those students who consumed energy drinks for more than one month. These two studies confirm previous research linking energy drink consumption to substance use (Istvanand Matarazzo, 2004; Kozlowski *et al.*, 2013). With the popularity of AmED increasing, researchers are interested in the effects these drinks have on consumers.

Energy Drink Consumption across Populations

Researchers investigated correlates of energy drink consumption, including rates across sex, race and ethnicity, and athlete status. The majority of research revealed energy drink consumption, as well as alcohol consumption, is more prevalent among males than females (Hamilton *et al.*, 2013; Miller, 2018; Velazquez *et al.*, 2022). Ballard *et al.* (2020) also found a higher consumption rate of AmED among white men and intramural athletes. As previous research shows, energy drinks are often advertised as performance enhancing (Rath, 2020). Because energy drinks are targeted more for athletes, Ballard *et al.*'s (2020) findings are not surprising. Miller (2018) termed the identity of athletes as "jock identity," and found individuals who identify strongly as a jock, conform to masculine norms, and partake in risky behaviors also consumed more energy drinks than their counterparts. Another study assessing energy drink consumption among 401 athletes revealed 315 consumed alcohol, 150 consumed AmED, and 194 consumed energy drinks (Woosley *et al.,* 2020). Those who consumed AmED were also more likely to consume larger amounts of alcohol and engage in binge drinking.

Research findings revealed racial and ethnic differences in energy drink consumption rates. A telephone survey conducted by Berger *et al.* (2021) found consumers of energy drinks in the past year were more likely to identify as non-Black minorities. Past-year AmED consumption was more frequently endorsed by individuals who identified as white. Similarly, Hamilton *et al.* (2013) found lower percentages of consumption among East, Southeast, and South Asian ethnic backgrounds. Unfortunately, a limited range of research exists concerning racial and ethnic demographics of consumers.

METHODOLOGY

Research Design

A cross-sectional survey was carried out among students in Oyo State higher institutions (The Polytechnic, Ibadan; University of Ibadan and Emmanuel Alayande College of Education, Lanlate). The design enabled the collection of data in form of responses from the respondents, who were randomly sampled. The sampling techniques selected representatives of the population. This survey method was considered appropriate because the study is centred on people and their differing opinions.

Population of the Study

The population for this study include both full-time and part-time National Diploma (I and II), Higher National Diploma (I and II), 100 level to 500 level students of The Polytechnic, Ibadan; University of Ibadan and Emmanuel Alayande College of Education, Lanlate respectively.

Sample size and Sampling Technique

For the purpose of the study, a total number of one hundred and fifty (150) students from the three listed institutions were used, the respondent are 53 (The Polytechnic, Ibadan), 53 (University of Ibadan) and 44 (Emmanuel Alayande College of Education, Lanlate). The study used Faculty of Engineering in Polytechnic Ibadan, Faculty of Education in University of Ibadan and Faculty of Child Education in Emmanuel Alayande College of Education, Lanlate. The goal is to obtain a sample that is representative of the larger population from the least of student. The study adopted simple random sampling technique. Respondents for this study were randomly sampled through simple random sampling and the use of a structured questionnaire.

Data Collection

For the purpose of the study, the researchers personally administer the instruments of the research work. The questionnaires were distributed and collected within two (2) weeks of distribution.

Source of Data

The data utilized for carrying out this study was mainly obtained from primary sources. Primary sources of data used for this study were questionnaire and interview. Copies of questionnaires was shown to experts and supervisor for their opinion and necessary corrections effected.

Research Instrument

For the purpose of this research, a well-structured questionnaire will be designed by the researcher without any ambiguous wordings to ease understanding. Given the qualitative nature of the work and the necessity of in-depth analyses of the variables, the researcher may divide the data analysis into sub-sections, highlighting the socio demographic characteristics under the first sub-section before using the specific objectives of the study.

Data Analysis

Interpretation of the data results included IBM SPSS Statistical Package, version 22.0 (SPSS Inc., Chicago, IL, USA). The analysis were presented in simple frequency and percentage table, with bar-chart illustration to support the findings.

RESULTS AND DISCUSSION

Socio-Demographic Characteristics of Respondents

Figure 1 presents the bar-chart relating to demography of respondents. It is observed that majority of the respondents sampled for this study were Male (87/58%), and the remaining were female (63/42%). It is further seen that 3% of the respondents were less than 18years, 52% were aged 19 – 24 years, 25 – 30 years of the sampled respondents are 40% and the rest 5% were aged Above 30 years. Also, 14% of the respondents practice Islam as their religion, 83% are Christian and the rest, 3% were Traditional Worshippers. This establishes that study sought opinion of all irrespective of their religion affiliation or belief.

Furthermore, 8% of the respondents were in ND 1, 6% of the respondents each were either in ND 2, 100 Level or 200 Level, 24% (i.e. 12% each) of the respondents are in HND 1 or Year 2, respondents sampled for this study in either HND 2, 400 Level and Year are 9% each of the total respondents level, respondents in 300 Level is 11%, while the rest 3% of the sampled respondents are in 500 Level. when respondents were probed about their type of studentship, majority, 128 (84%) of the respondents are full-time students, while the remaining 22 (16%) are part-time students. The foregoing shows that the study cut across all type of studentship, thus giving more validation to the results obtained from this study.

Majority of the respondents who participated in this study lived alone (64%), those living with roommates were 45 (30%), while the remaining 9 (6%) were living at home with their family.

Lastly, when respondents were asked about their mother's education level, 17% of the respondents' mother had primary education, 40% had Secondary level, while a slight majority while 43% had Tertiary education. However, the Educational Level of respondents' fathers is very much impressive with 58% had up to Tertiary level, 31% had Secondary Education while the rest 11% of the respondents had Primary Education.

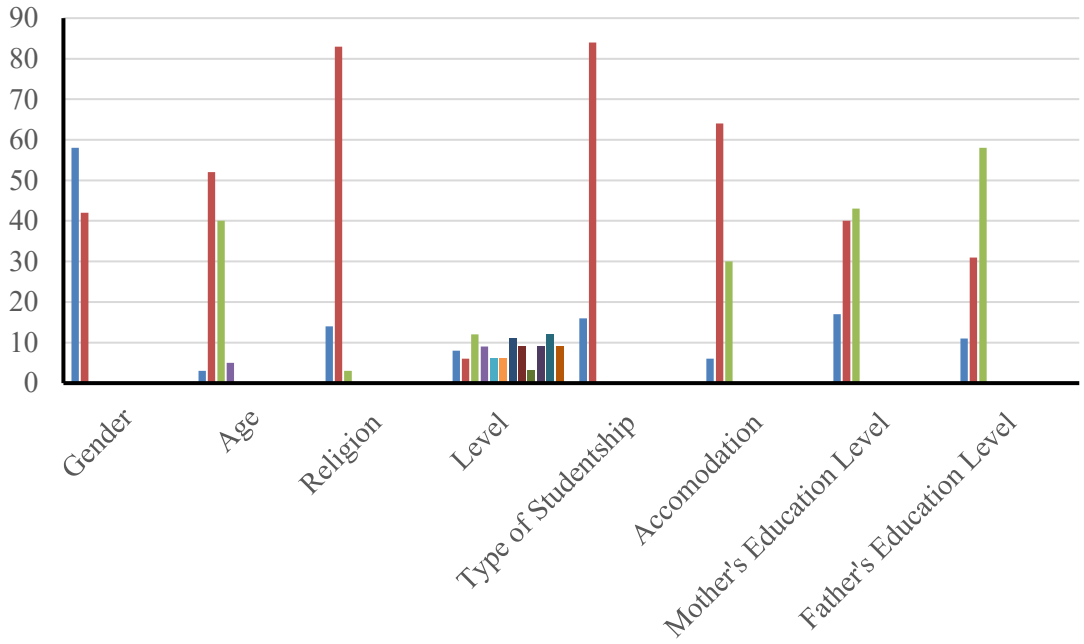


Figure 1 Socio-Demographic Characteristics of Respondents

Social Habits of Respondents: Smoking, Alcoholism and Energy Drinks Consumption

Figure 2 present distribution of responses on participant's habit regarding smoking, alcohol and energy drink consumption in three different Oyo State institutions. It is seen that 57% of the respondents are non-smoker. The rest 43% are smoker. This finding establishes that both smokers and non-smokers consume energy drink.

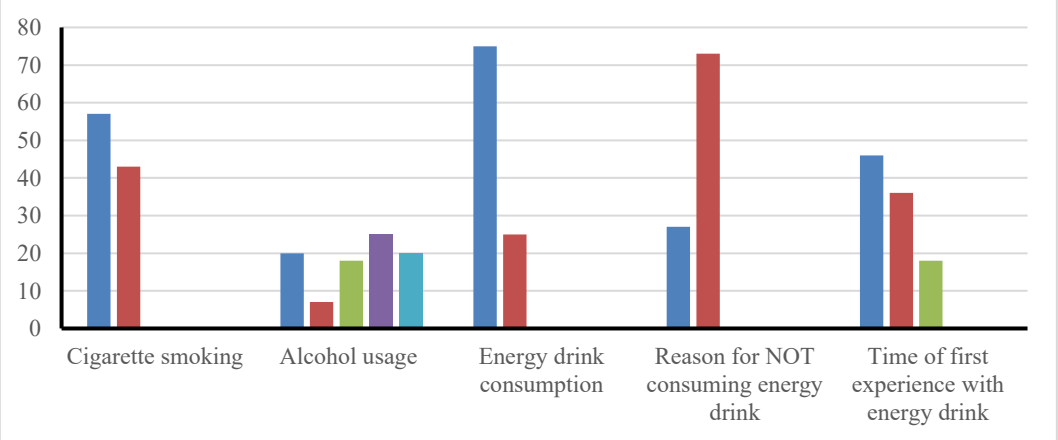
Moreso, 20% of the respondents admitted that they have never consumed energy drink with energy drink, 7% rarely mix alcohol with energy drink, 18% of the sampled respondents frequently mix alcohol with energy drink, while 20% and 25% of the sampled respondents often and always respectively mix alcohol with energy drink.

This finding established that majority of the sampled respondents use energy drink with alcohol.

However, 112 representing 75% of the respondents also admitted that they have at least consumed energy drink once, while the rest 38 representing 25% denied this assertion. This finding establishes that consumption of energy drink is rampant among students in tertiary institutions in Oyo State.

Of the 38 respondents, who responded in the negative to consumption of energy drink, 10 representing 27% of the respondents abstained from its consumption because they felt it is not healthy, while the other 28 (73%) have no particular reason for energy drink non – consumption.

Furthermore, when the 112 respondents who have consumed energy drink at least once were asked when they first had contact with energy drink, 52 representing 46% of the respondents first consumed energy drink during the primary school education, followed by 36% in Secondary school, while 18% consumed energy drink during their tertiary education days. This finding reveals that majority of the sampled respondents have been exposed to energy drink consumption right before their admission as a student, thus mitigating or rubbishing any thought or intuition that freedom as a result of life on campus influence respondents consumption of energy drink.



Energy Drinks Consumption

Figure 3 reveal distribution of responses on participants' habit of energy drink consumption. It is observed that 47% of the respondents consume more than 1 energy drink per day, additionally, 24%, 26% and 3% consumed energy drink one per day, once in a week and once in a month respectively. The foregoing reveals that abuse of energy drink is rampant in tertiary institutions in Oyo State. Also, 27 representing 18% of the respondent first consumed energy drink at Bar, another 9 representing 6% of the sampled respondents first had contact with energy drink at Restaurant while, 30 representing 20% first consumed energy drink At A Party. However, 84 representing 56% first had contact with energy drink at other places.

Furthermore, when respondents were questioned about their companion during first consumption of energy drink, 57 (38%), 66 (44%) and 27 (18%) chose None, Friend(s) and Family member(s) respectively.

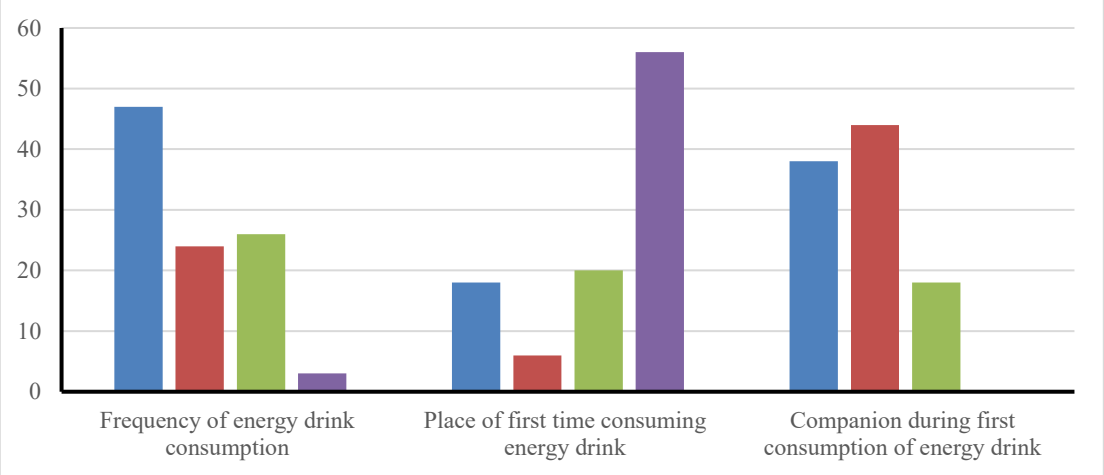


Figure 3 Distribution of responses on participants' habit of energy drink consumption

Reason for Consumption of Energy Drink

Figure 4 present distribution of responses on reason for consumption of energy drink. It is seen that 89% of the respondents believed that energy drink has good taste. 17 representing 11% of the respondents disagreed to this assertion. Also, 91% of the respondents believed that it boosts energy need, 9% disagreed to this assertion. In addition, 70% of the respondents attributed their reason for consumption of energy drink to studying and to stay awake for hours, while the rest 30% disagreed otherwise. Finally, when respondents were asked if energy drink reduces fatigue and love for sugary drinks is their reason for its consumption, 58% agreed while the rest 42% disagreed to this reason.

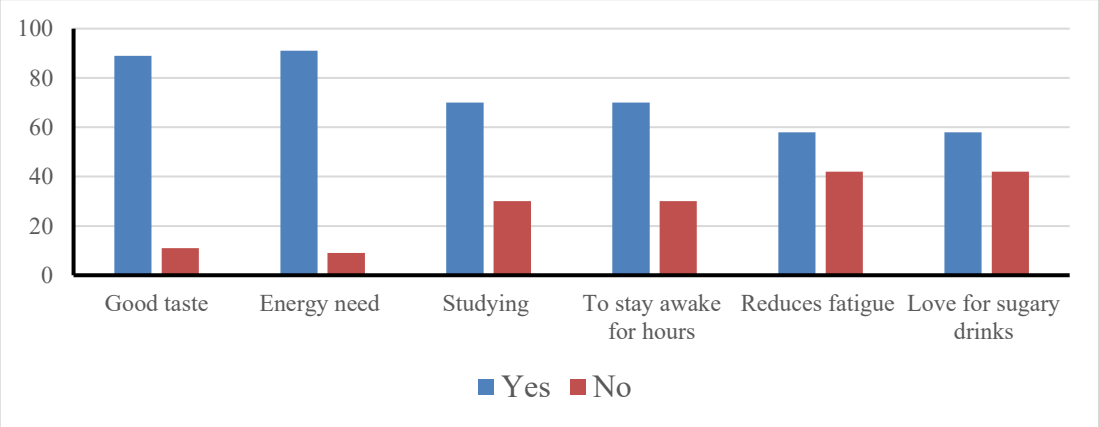


Figure 4 Reason for consumption of energy drink

Physical Effect of Energy Drink

Figure 5 present distribution of responses on physical effect of energy drink in Oyo State institutions. It is seen that 23% and 46% of the respondents Strongly Agree and Agree respectively to the assertion that consumers of energy drink look healthy. The rest 28% and 3% disagreed and strongly disagreed on this assertion. This finding establishes that consumers of energy drink look healthy physically.

Moreso, 85% of the respondents admitted that energy drink increases energy, the remaining 15% disagreed on this point. As suspected, consumption of energy drink can be attributed to the believe that energy drink increases energy level of consumers. Similarly, when respondents were probed if energy drink consumption improve concentration and focus, 12 representing 8% of the respondents Strongly Agree, another 85 representing 57% of the respondents Agree, while 51 respondents and 2 respondents disagreed and strongly disagreed respectively to this assertion.

In addition, 25% of the respondents also Strongly Agreed that energy drink elevate heart rate and blood pressure, 60 representing the majority respondents Agreed that energy drink consumption elevate heart rate, followed closely by 51 respondents representing 34% disagreed, while the rest 1% strongly disagreed on this point. This finding establishes that consumers of energy drink are at risk of elevated heart rate and blood pressure.

Furthermore, 11% of the respondents Strongly Agreed that consumption of energy drink increases urination, another 111 (74%) agreed that energy drink consumption have diuretic effect, 18 (12%) and 5 (3%) Disagreed and Strongly Agreed respectively to the diuretic ability of energy drink.

Interestingly, when respondents were asked if energy drink increase calories burning and if energy drink brings more jitters and nervousness to consumers, response from respondents were almost similar with 14% Strongly Agree for both, 52% Agree for both, 29% and 28% for Disagree and 5% and 6% for Strongly Disagree respectively.

Finally, 20%, 62%, 14% and 4% of respondents chose Strongly Agree, Agree, Disagree and Strongly Agree respectively when they were asked if energy drink consumption leads to insomnia and disrupted sleep patterns. A critical analysis of this section reveals that there is physical effect of energy drink consumption on consumers in Oyo State institutions.

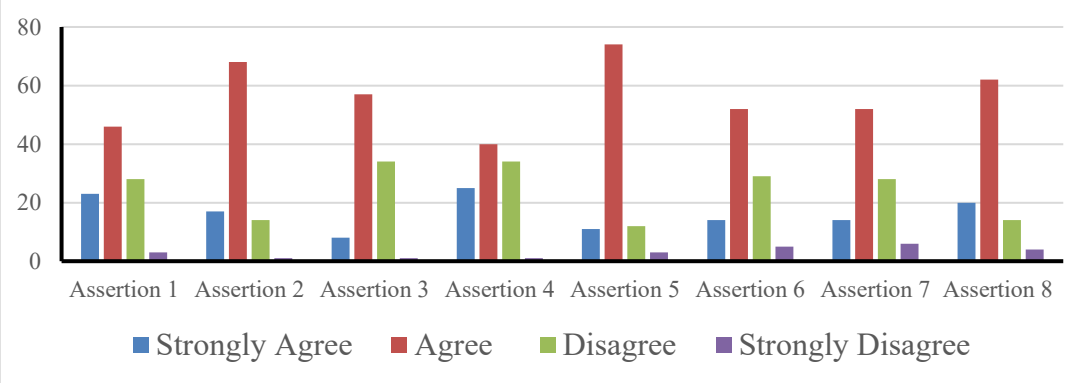


Figure 5 Physical effect of energy drink in Oyo State institutions

Effect of Energy Drink on Social Life of Students in Oyo State institutions

Figure 6 reveal distribution of responses on effect of energy drink on social life of students in Oyo State institutions. It is observed that 26% of the respondents Strongly Agree that energy drink exponentially increase alertness, majority 85 representing 57% of the total respondents Agreed, another 28% Disagreed to this statement, while the remaining 3% Strongly Disagree with this notion. Also, 12 representing 8% of the respondent Strongly Agree that energy drink helps in socialization and social events management, while 93 representing 62% Agreed. 42 respondents representing 28% and 3 (2%) Disagreed and Strongly Disagreed respectively that energy drink helps in socialization and social events management. Similarly, a total of 61% of the sampled respondents Strongly Agree and Agree, while the remaining 39% Disagree and Strongly Disagreed to the assertion that energy drink gives morale to marketing and branding promotion.

Furthermore, 20% of the respondents Strongly Agree, majority 56% Agree, another 23% Disagree, while 1% Strongly Disagree that energy drink brings about health concern and risk. Also, when respondents were posed with the question if users of energy drink becomes caffeine dependent, 31 representing 21% Strongly Agreed, 90 representing 60% Agreed, while 12% and 7% of the respondents Disagree and Strongly Disagree that users of energy drink becomes caffeine dependent. Similarly, 17%, 38%, 42% and 3% of the respondents chose Strongly Agree, Agree, Disagree and Strongly Disagree respectively when asked if energy drink improves productivity. Finally, when respondents were probed if energy drink needs regulatory and legal guideline on consumption against frequent abuse, 54 representing 36% of the total respondents Strongly Agree, another 72 representing 48% of the respondents Agreed, a paltry 13 and 11 representing 9% and 7% of the respondents Disagreed and Strongly Disagreed respectively.

A critical dissection of the foregoing table revealed that energy drink significantly affect social life of students in Oyo State institutions, with level of agreement ranging from 55% to as much as 84%.

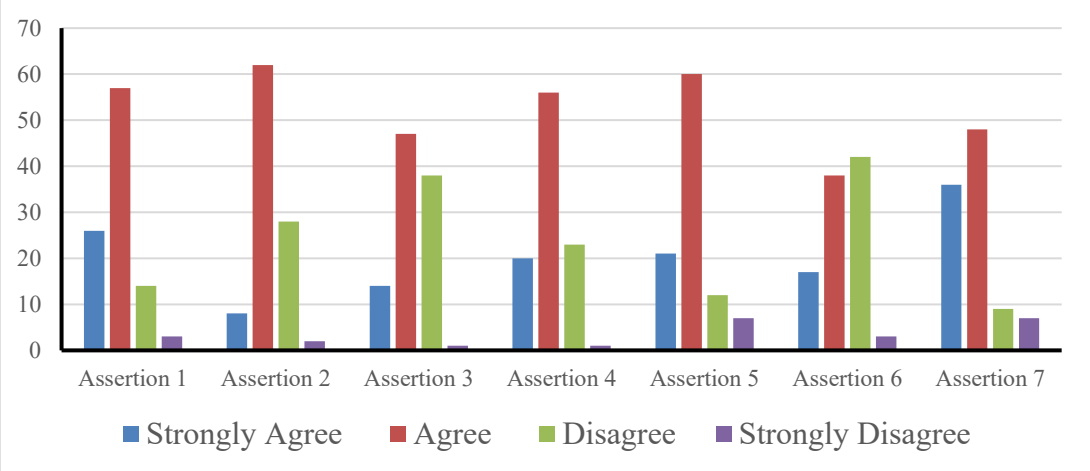


Figure 6 Effect of Energy Drink on Social Life of Students in Oyo State institutions

Effect of Energy Drink on Academic Performance

Figure 7 present distribution of responses on effect of energy drink on academic performance of students in Oyo State institutions. It is observed that 24% of the respondents Strongly Agreed that energy drink affects class attendance due to sleep disruption, majority, 78 representing 52% of the total respondents Agreed to this notion. 38 representing 24 in the ratio 14% to 4% Disagreed and Strongly Disagreed that energy drink affects class attendance due to sleep disruption.

Also, 38% and 44% of the respondents Strongly Agree and Agree respectively that energy drink makes student become anxious and unnecessarily restless during lecture, 14% Disagreed to this assertion, while the remaining 4% Strongly Disagree to this statement.

In addition, when respondents were quipped if energy drink negatively affect health of students thus of the respondents believed that organizational configuration and employee engagement could bring about job satisfaction while the rest 24% disagreed that organizational configuration and employee engagement could bring about job satisfaction.

Finally, when respondents were asked if they believe that energy drink abets unhealthy lifestyle choices, 27 (18%) Strongly Agree, majority 96 (64%) Agreed, while the rest 27 (18%) Disagreed to this information.

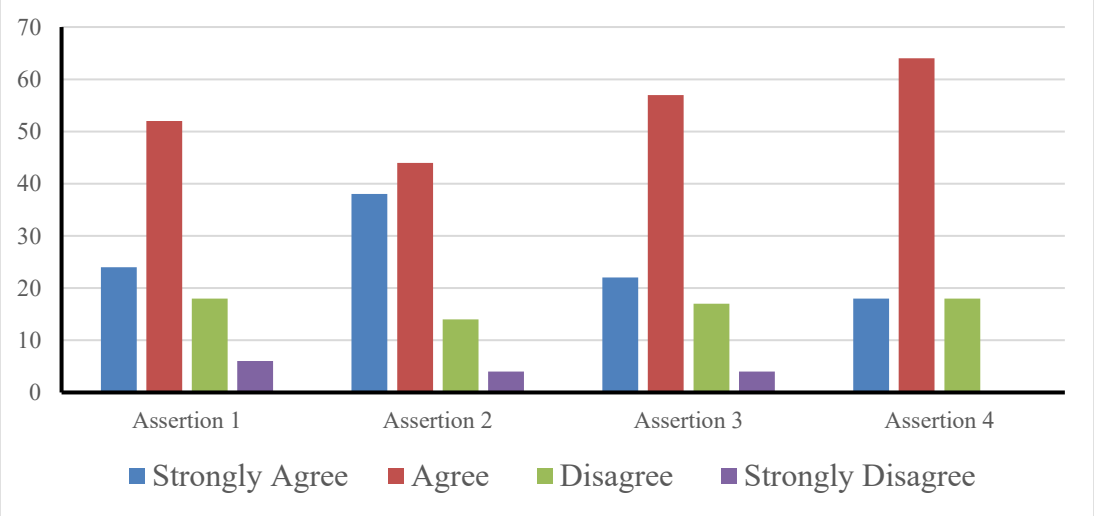


Figure 7 effect of energy drink on academic performance of students in Oyo State institutions.

Psychological Effect of Energy Drink on Students

Figure 8 present distribution of responses on psychological effect of energy drink in Oyo State institutions. It is observed that 23% and 56% of the respondents Strongly Agree and Agree respectively to the assertion that energy drink improves alertness and

concentration. The rest 17% and 4% Disagreed and Strongly Disagreed on this assertion.

Moreso, 79% of the respondents both Strongly Agreed and Agreed that energy drink causes elevated mood and euphoria, the remaining combined 21% Disagreed and Strongly Disagreed on this point. Similarly, when respondents were probed if energy drink enhances physical and mental performance, 26 representing 17% of the respondents Strongly Agree, another 85 representing 58% of the respondents Agree, while 14% respondents and 11% respondents Disagreed and Strongly Disagreed respectively to this assertion.

In addition, 20% of the respondents Strongly Agreed that energy drink consumption increases heart rate and blood pressure, 90 (60%) representing the majority respondents Agreed that energy drink consumption increases heart rate and blood pressure, followed by 26 respondents representing 17% Disagreed, while the rest 3% strongly disagreed on this point. This finding establishes that consumers of energy drink are at risk of elevated heart rate and blood pressure.

Furthermore, 17% of the respondents Strongly Agreed that consumption of energy drink leads to unnecessary jitters and nervousness, another 69 (46%) Agreed that energy drink consumption leads to unnecessary jitters and nervousness, 39 (26%) and 16 (11%) Disagreed and Strongly Agreed respectively to energy drink consumption leading to unnecessary jitters and nervousness.

Interestingly, when respondents were asked if energy drink consumption causes fatigue and crashes users, response from respondents were 11% Strongly Agree, 60% Agree, 22% for Disagree and 7% for Strongly Disagree.

Finally, 17%, 49% and 34% of respondents chose Strongly Agree, Agree and Disagree respectively when they were asked if energy drink consumption leads to dependency and withdrawal. A critical analysis of this section reveals that there is psychological effect of energy drink on students in Oyo State institutions.

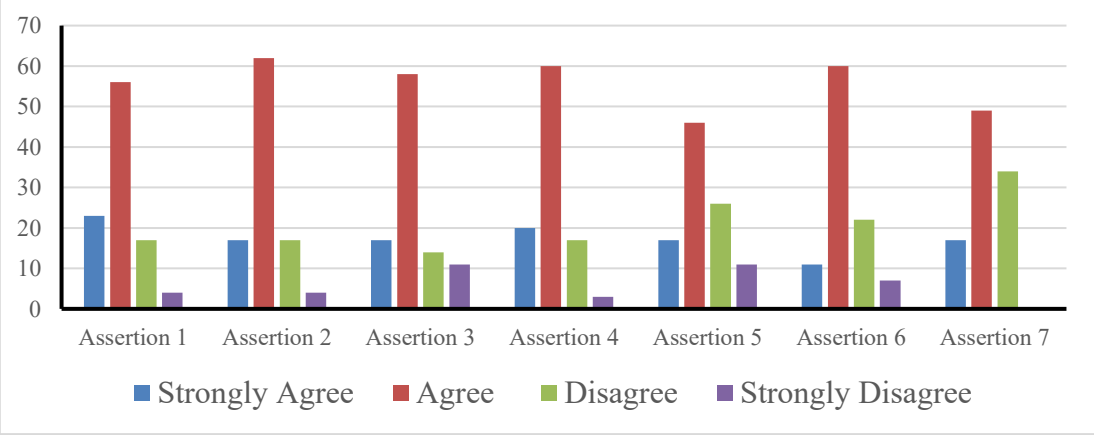


Figure 8 Psychological effect of energy drink in Oyo State institutions.

DISCUSSION

The general consumption of energy drinks has increased among tertiary institution students, increasing probably because of the concentration enhancement and fatigue-relieving effects of energy drinks, yet there is no significant information regarding the safety and quality of these products (Aljaloud, 2016). In Saudi Arabia, where 46% of respondents reported consumption of energy drink, in Nigeria, where 44.2% of the adolescents consumed energy drink, and among Turkish tertiary institution students where 52.5% of students consumed energy drink (Hasan *et al.,* 2019). Students interviewed in various studies reported either ever used or currently using energy drinks. This is emphasizing the popularity of the products among the age groups and unfolding the potential consequences of unregulated use. This requires increasing public enlightenment, particularly students on the need to ensure compliance with dietary practice principles as a strategic approach to reducing the burden of emerging non-communicable diseases due to nutritional transition and its resultant socio-economic burden.

In addition, there is need to ascertain the role of combined consumption of alcohol and energy drinks in terms of health consequences and also the reason for the combination, especially looking at the findings of a study conducted in Poland that found many students to admit to mixing energy drinks with alcohol. Though more senior high schools 37% than from junior high schools (14%) mixed EDs with alcohol (Nowak and Jasionowski, 2015), this signifies the popularity and utilization of energy drinks with alcohol among students at various levels showcasing the need for research and intensified campaign to ensure regulated consumption.

CONCLUSION AND RECOMMENDATIONS

Conclusion

From the investigation carried out it is obvious energy drink consumption has direct impact on students of tertiary institutions in Oyo State, government should as a matter of urgency setup necessary control measures against abuse.

From the results obtained;

- Majority of the sampled respondents were Male, aged 19–24 years, Christian faith, Full-time student, live-alone, respondents' mothers and fathers being educated till the Tertiary level.
- Most of the sampled respondents consume energy drink more than once per day, their first time of consuming energy drink was in other places and their companion during first time of energy drink consumption were their friend(s).
- The study revealed that there is adverse effect of energy drink on academic performance of sampled respondents

- The physical effect of energy drink consumption in Oyo State institution was also negative.
- The social life of students who drink energy drink in Oyo State institutions is also negatively affected as they seem to be more introvert and withdrawn from social functions although they attend social gatherings.
- The emotions of students who consume energy drink is unstable.
- Additionally, sampled respondents agreed that energy drink consumption leads to dependency and withdrawal, thus negatively affecting their psychology.

Recommendations

Based on the findings given above, the following recommendation are made by the researcher;

i. Government should ensure regulated advertisement of energy drinks to involve the ingredients, benefits of consumption and available evidence of the negative consequences of over-usage.
ii. Pubic enlightenment programs through various mass media should be strengthened.

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