

## Knowledge, Attitude and Practices of Energy Drinks Consumption Among Undergraduate Students of Bayero University, Kano

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### ABSTRACT

**Background:** Caffeine being the major component in the energy drink is known to produce some negative effects and therefore its abuse may result in significant public health challenges. **Objectives:** This study aimed to determine knowledge, attitude and practice of energy drinks consumption among undergraduate students of Bayero University Kano, Northwest Nigeria. **methods:** A descriptive cross-sectional study design was used to study 381 undergraduate students selected using a two-staged sampling technique. Data were collected using interviewer administered questionnaires. The SPSS version 21 was used for data analysis with a p-value of  $\leq 5\%$  considered statistically significant. **Result:** The age of the respondents ranged from 17 to 49 years with a Mean  $\pm$  SD of  $23.1 \pm 3.6$  years. The majority of the respondents were Muslims (91.6%). More than one-quarter (31.0%) of the respondents were studying health-related courses in the University. Up to 13% of the respondents had satisfactory knowledge of energy drinks while 79% had negative attitudes towards energy drink consumption. The knowledge of energy drinks consumption was found to be significantly associated ( $p < 0.05$ ) with sex, residence, sponsorship and influence on choice. The practice was significantly associated with sex, faculty and influence on choice. Further, the attitude was significantly associated ( $p < 0.05$ ) with age, sex, tribe and influence on choice. **Conclusion:** The majority of the respondents had unsatisfactory knowledge and practice of energy drinks and negative attitude towards its consumption. The government should ensure strategies that can promote healthy consumption of energy drinks.

**Keywords:** Prevalence, energy drinks, knowledge, attitude, practice

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### Introduction

The energy drink (ED) consumption has continued to gain attention after the entry of Red Bull into the market, which is known as the current leader in the energy drink market,<sup>1</sup> with young adults, teenagers and students of colleges to be the main targets of energy drinks promotion by producers.<sup>1</sup> The energy drinks contains different ingredients including higher doses of stimulant,<sup>2</sup> and were believed to increase alertness, improve mental and physical activities.<sup>1-3</sup> Caffeine is the major component in the energy drink and results in effects that make the drink 'desirable and increased consumption, thus abuse inevitable.<sup>1-5</sup> This is not unrelated to the aggressive marketing and poor awareness on the consequences of high caffeine intake,<sup>3</sup> coupled with the reported benefits by the consumers of energizing effects.<sup>3</sup> The energy drinks have been reported to improve attention and/or reaction times and alertness, reduce fatigue, provide energy, promote wakefulness and provide cognitive and mood enhancement in some studies, the combination of caffeine and glucose was

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reported to ameliorate deficits in cognitive performance and subjective fatigue during extended periods of cognitive demand.<sup>4</sup> However, several ingredients of ED, with sucrose and caffeine taking the lead, may have unwanted health consequences and should be used carefully.<sup>4</sup>

As the global market for energy drinks approaches nearly \$15 trillion, the general consumption of energy drinks has increased accordingly, particularly among university students.<sup>6,7</sup> It has been reported that the consumption of energy drinks, especially among adults aged between 18 and 25 years is currently of great concern.<sup>6</sup> This is because these ED typically contain more than three times the amount of caffeine and other ingredients present in the soft drinks,<sup>6</sup> and consumers may experience neuropsychosis.<sup>8</sup> Frequency of energy drink consumption was reported to positively be associated with "problem behaviours" exhibited such as sexually risky behaviours, marijuana use, aggression, and failure to use seat belts by drivers.<sup>8</sup>

In long term, too much caffeine may contribute to low bone density and may harm unborn children and nursing babies (if consumed by the mother),<sup>1-6</sup> and chronic daily headaches.<sup>6</sup> In addition, consumption of two or more drinks in a single day is considered excess and may result in the negative consequences.<sup>9,10</sup> Therefore, the desire by the college students to sleep less and work more often lead university students to the use ED to get through long nights spent in preparation for exams or turning in an assignment.<sup>11</sup> Unfortunately, the governments have taken relatively little action to regulate the production or marketing of energy drinks to consumers.<sup>12</sup> Few consumers of ED were found to know about the ingredients and potential health risks associated with energy drink consumption and this may have an influence on their attitude towards and practices of consumption,<sup>13</sup> and excess consumption may result in addiction or sometimes cause intoxication in the human body.<sup>14,15</sup>

There is paucity of data on knowledge, attitude and consumption practices of ED among adolescents and young adults in Kano particularly undergraduate students who are the primary target of energy drinks advertising companies and most of the students are not aware of the ingredients and the side effects which are also not uncommon following consumption of ED. This study therefore set out to assess the knowledge, attitude and practices of ED consumption as the

findings can provide a guide to the policy makers that may result in improved marketing strategy taking into consideration all the potential side effects.

## Materials and Methods

### Study area

Kano is a State in Northwestern Nigeria (11°30 N, 8°30E) and is the most populous state of the Nigerian Federation with a projected population of 11,760,156 as at 2015 from the census carried out in 2006 by the National Population Commission (NPC).<sup>16</sup>

Bayero University Kano was established in October 1960 as Abdullahi Bayero College under the then Northern Nigerian University. The university has 4 campuses: old and new campuses, an affiliated Teaching Hospital for teaching clinical students and, school of continuing education. The university offers courses ranging from undergraduate to postgraduate courses with an approximate number of undergraduate students of 34,895 students for the three campuses and 4,343 for the school of continuing education.

### Study design

Descriptive cross sectional study design was used

### Study population

The study population consisted of all male and female undergraduate students of Bayero University Kano. All male and female undergraduate students present in the University for more than One Semester (12 weeks) were included while those not available for any reason during data collection and those in other institutions affiliated to Bayero university, Kano within or outside Kano were excluded from this study.

### Sample size estimation

The sample size was estimated by using the formula for sample size determination for the descriptive studies.<sup>16-18</sup> Using  $z =$  standard normal deviate corresponding to 95% confidence interval i.e 1.96 (from the normal distribution table),  $p =$  prevalence of energy drinks consumption among undergraduates = 66.1%,<sup>4</sup>  $q = 1 - p = 1 - 0.661 = 0.339$ ,  $d =$  desired precision which is 5% and 10% possible non-response, the minimum sample size was 381.

### Sample technique

A two-staged sampling technique was used to select respondents for the study. In stage one, mapping and numbering of shops in the campuses were conducted.



There were 47 shops in new campus, 15 in Old campus, 11 in Aminu Kano Teaching Hospital campus (AKTH) and 5 in School of continuing education campus (SCE). The shops to be studied were proportionately allocated based on the total shops in each of the four campuses. To choose each of the shops to study in each campus, balloting was done. Equal numbers of questionnaires were distributed in the selected shops of the campuses.

In stage two, the average number of students patronizing the selected shops were generated over two weeks to find out the average sampling frame. Each of the selected shops in new site had an average sampling frame of 200, and the selected shops of old site had an average sampling frame of 195, an average of 250 was obtained as the sampling frame of the selected shops in AKTH while the selected shop of SCE had an average sampling frame of 800.

Systematic sampling was used to study the eligible respondents. Sampling interval was obtained as the ratio of sampling frame to the sample size. The equally allocated sample size for the selected shops were used to calculate the sampling intervals. List of undergraduate students were generated daily during data collection process. The first respondent was selected by balloting using the numbers within the range of the calculated sampling intervals in each of the study campuses.

Thereafter, the sampling intervals were added until the allocated numbers of eligible respondents were studied in each campus.

### **Instrument and method of data collection**

The Adapted semi-structured interviewer administered questionnaire was written in English were used for data collection.<sup>17</sup> The instrument has four sections: Section one of the questionnaire sought information on the socio-demographic characteristics of the respondents.

Section two was on information regarding the knowledge of energy drink, section three sought information on the attitude while section four asked on the practice of energy drinks consumption. Data was collected by twelve trained research assistants from 15<sup>th</sup> January to 23<sup>rd</sup> March, 2021. The research assistants were trained on the objectives of the study, interpersonal communication skills and procedures for community entry and data collection. The questionnaire was pre-tested in another University outside Kano metropolis.

### **Data analysis and measurement of variables**

Data collected were entered into Microsoft excel, appropriately cleaned and analyzed using SPSS statistical software version 21. Quantitative data was summarized using mean $\pm$  SD and/or median and range as appropriate, while categorical variables were summarized using frequencies and percentages. The outcome variables were knowledge of energy drinks, attitude and practices of energy drinks consumption respectively while the independent variables were age, sex, marital status among others.<sup>18</sup>

### **Knowledge Domain**

Up to 17 questions were used to assess the knowledge of energy drinks consumption. A correct response to any question was given one point while any wrong response was awarded a zero point. Total scores for each respondent were summed up. A total score of 0-9 was graded as unsatisfactory knowledge while score of 10-17 was considered as satisfactory knowledge.<sup>18</sup>

### **Attitude Domain**

Ten questions were used in assessing the attitude towards energy drinks consumption using Likert scale. Correct response to each question was given one point while any wrong response attracted a zero point. Total scores were summed up and a score of 0-5 was considered as negative while 6-10 was considered as positive attitude towards energy drinks consumption.<sup>18</sup>

### **Practice Domain**

Sixteen questions were used to assess the practices of energy drinks consumption. Any correct response was given one point while wrong responses attracted a zero point. Total scores were summed up. A score of 0-9 was considered as unsatisfactory practice while scores of 10-16 were considered as satisfactory practice.<sup>18</sup>

Persons Chi square test was used to determine the factors associated with the knowledge, attitude and practices of energy drinks consumption with statistical significance set at  $p \leq 5\%$

### **Ethical considerations**

Ethical approval was obtained from Health Research Ethics Committee of Kano State Ministry of Health with approval number: MOH/OFF/797/1989. All the principles of research ethics were adhered to throughout the data collection process.



## Result

A total of 381 questionnaires were administered and returned giving a response rate of 100%. The age of the respondents ranged from 17 to 49 years with a Mean±SD of 23.1±3.6years. Majority of the respondents (86.9%) above 19 years and 13.1% were below 19 years. About one-half of the respondents were males (50.9%). About two-thirds of the respondents (63.3%) were Hausa by tribe and up to (86.1%) of the respondents were unmarried as shown in Table 1 below.

The maximum knowledge score among the respondents was 16 and the minimum was 0 with a Mean±SD of 6.4±2.6. Majority of the respondents (87.0%) had unsatisfactory knowledge of energy drinks with only 13% having satisfactory knowledge. Regarding the knowledge of Energy Drinks consumption, most of the respondents (94.5%) have heard of energy drinks. More than a half of the respondents (58.0%) correctly defined energy drinks and (59.6%) reported that it is potentially used to boost physical and mental energy. More than one-half (58.5%) were able to correctly mention the potential side effects of energy drinks as shown in table 2 below. The minimum attitude score was 0 and the maximum score was 10 with a median of 3 and range of 10. The majority of the respondents 79% had a negative attitude towards energy drinks consumption. Similarly, more than half (56.2%) of the respondents reported drinking because people whose opinion they

respect consume energy drinks. More so, about two-thirds (62.6%) like the buzz feeling of caffeine while 68.2% think it enhances their performance at work as shown in table 2.

The minimum practice score among respondents was 4 and the maximum score was 17 with a Mean±SD of 9.3±3.2. More than a half of the respondents (53%) had unsatisfactory practices of energy drinks consumption. About two-third of the respondents (65.9%) reported drinking one energy drink in one sitting. More than one-half (54.1 %) drink only a bottle in a day as shown in table 2 below.

Table 3 shows that male undergraduate students (16.5%,  $p=0.03$ ), students residing on campus (17.4%,  $p=0.03$ ), likewise those on self-sponsorship (27.8%,  $p=0.005$ ) had satisfactorily better knowledge of energy drinks.

Table 4 shows that female students (28.3%,  $p=0.01$ ), sponsorship by parents (22.3%,  $p=0.01$ ) had significantly better positive attitude towards energy drinks consumption while table 5 shows that for practice, satisfactorily better practice was noted to be significant among male ( 53%,  $p=0.02$ ), those reading non-health related courses ( 51%,  $p=0.02$ ) and receiving information on energy drinks from family members ( 57.1%,  $p=0.04$ ).



**Table 1:** Socio-Demographic Characteristics

Variable (s)	Frequency (n=381)	Percentage (%)
Age(years)		
0-19	50	13.1
>19	331	86.9
Gender		
Males	194	50.9
Females	187	49.1
Religion		
Islam	349	91.6
Christianity	32	8.4
Ethnicity		
Hausa	241	63.3
Fulani	78	20.5
Yoruba	34	8.9
Igbo	18	4.7
Others	10	2.6
Marital status		
Unmarried	328	86.1
Married	53	13.9
Level of Study		
Level 100	63	16.5
>Level 100	318	83.5
Faculty		
Health science based	118	31
Non-health science based	263	69
Residence		
On campus	149	39.1
Off campus	232	60.9
Sponsorship		
Self	36	9.4
Parents	333	87.4
Government scholarship	12	3.1
Cigarette Smoking		
Yes	5	1.3
No	376	98.7
Alcohol consumption		
Yes	12	3.1
No	369	96.9
Influence on Choice		
Price	129	33.9
Popularity	37	9.7
Taste	83	21.8
Ingredients	98	25.7
Volume	20	5.2



**Table 2:** Correct Responses to Parameters Used to Assess Knowledge, Attitude and Practices

Knowledge items	Frequency	Percent age	Attitude items	Frequency	Percent age	PRACTICE ITEMS	Frequency	Percent age
	n=381	(%)		n=381	(%)		n=381	(%)
Heard of energy drinks	360	94.5	Energy drink is enjoyable	41	10.8	Number of drinks taken in one sitting	251	65.9
Carbonated beverage with caffeine	221	58	It is good to consume energy drinks	174	45.7	Number of times energy drinks are taken in a day	206	54.1
Drinks that boost physical and mental energy	227	59.6	Other people like me consume energy drinks	96	25.2	Other caffeinated drinks taken	216	56.7
Drinks that make you energetic	225	59.1	Peoples whose opinion I respect consume energy drinks	167	43.8	How do you take it	157	41.2
Aware of Ingredients	250	65.6	I like the buzz feeling of caffeine	145	38.1	Where do you consume		
Caffeine	250	65.6	Enhance my performance at work	121	31.8	School	148	38.8
Sugar	235	61.7	Increase my strength	118	31	Restaurant	90	23.6
Vitamins	178	46.7	Increase my ability to cope with pain	118	42.5	Home	148	38.8
Taurine	91	23.9	Reduce stress	128	33.6	Party	46	12.1
Aware of side effects	223	58.5	Help me stay hydrated and quench my thirst	139	36.5	Ever mixed drink with alcohol	311	81.6
Experienced side effects	308	19.2				Participation in unhealthy activities		
Insomnia	35	9.2				No use of safety belts	192	49.6
Headaches	26	6.8				Violence	193	50.7
Increased Heart rate	16	4.2				Drive fast	194	50.9
Anxiety	16	4.2				Drive under influence of alcohol	195	51.2
Increased urine frequency	17	4.5				Carry guns/weaponry	194	50.9
						Consider Energy drinks same as soft drinks	227	59.6
						Effect of energy drinks		
						Effective/very effective	327	85.8
						Ineffective	54	14.2



**Table 3: Factors Associated with Knowledge of Energy Drinks**

Knowledge of energy drink					Knowledge of energy drink				
Variable(s)	Unsatisfactory	Satisfactory	$\chi^2$	p-value	Variable(s)	Unsatisfactory	Satisfactory	$\chi^2$	p-value
Age (years)					Cigarette Smoking				
≤ 19	41(82.0)	9(18.0)	1.4	0.2	Yes	5(100)	0(0.0)	0.7	0.3
>19	291(87.9)	40(12.1)			No	327(87.0)	49(13.0)		
Sex					Alcohol consumption				
Male	162(83.5)	32(16.5)	4.7	0.03*	Yes	12(100)	0(0.0)	1.8	0.2
Female	179(90.9)	17(9.1)			No	320(86.7)	49(13.3)		
Religion					Source of Energy drinks information				
Islam	305(87.4)	44(12.6)	0.2	0.6	No source	18(100)	0(0)	7.6	0.1
Christian	27(84.4)	5(15.6)			Media	120(84.5)	22(15.5)		
Ethnicity					Books	18(94.7)	1(5.3)		
Hausas	281(88.1)	38(11.9)	1.6	0.2	Friends	136(85)	24(15)		
Non-Hausas	51(82.3)	11(17.7)			Family members	40(95.2)	2(4.8)		
Marital status					Others	332(87.1)	49(12.9)		
Unmarried	283(86.3)	45(13.7)	1.6	0.2	Influence on Choice				
Married	49(92.5)	4(7.5)			No response	123(95.3)	6(4.7)		
Level of Study					Price	33(89.2)	4(10.8)	18.8	0.002*
Level 100	55(87.3)	8(12.7)	0.002	0.9	Popularity	69(83.1)	14(16.9)		
>Level 100	277(87.1)	41(12.9)			Taste	83(84.7)	15(15.3)		
Faculty					Ingredients	15(75)	5(25)		
Health science based	107(90.7)	11(9.3)	1.9	0.2	Volume	9(64.3)	179(47)		
Non-health science based	225(85.6)	38(14.4)							
Residence									
On campus	123(82.6)	26(17.4)	4.6	0.03*					
Off Campus	209(90.1)	23(9.9)							
Sponsorship									
Self	26(72.2)	10(27.8)	7.9	0.005*					
Parents	306(88.7)	39(11.3)							



**Table 4:** Factors Associated with Attitude Towards Energy Drinks Consumption

Variable(s)	Attitude towards energy drink consumption		$\chi^2$	p-value	Variable(s)	Attitude towards energy drink consumption		$\chi^2$	p-value
	n=381(%)					n=381(%)			
	Negative	Positive				Negative	Positive		
Age (years)									
≤ 19	37(70)	15(30)	2.8	0.01*					
>19	265(80.4)	65(19.6)							
Sex									
Male	167(81.6)	27(13.9)	11.9	0.001*					
Female	134(71.7)	53(28.3)							
Christian	26(81.3)	6(18.8)			Yes	5(100)	0(0)	1.3	0.2
Ethnicity					No	296(78.7)	80(21.3)		
Hausas	245(76.5)	74(23.2)	5.7	0.02*	Alcohol consumption				
Non- Hausas	58(99.3)	6(9.7)			Yes	89(66.7)	4(33.3)	1.1	0.3
Marital status					No	293(79.4)	76(20.6)		
Unmarried	257(78.4)	71(21.6)	0.6	0.4	Source of Energy drinks information				
Married	44(83.0)	9(17.0)			No source	12(66.7)	6(33.3)	4.8	0.3
Level of Study					Media	115(81.0)	27(19.0)		
Level 100	45(17.4)	18(28.6)	2.6	0.2	Books	14(73.4)	5(26.3)		
>Level 100	256(80.5)	62(19.5)			Friends	123(79.9)	37(23.1)		
Faculty					Family members	37(81.1)	5(11.9)		
Health science based	69(75.4)	29(24.6)	1.3	0.2	Influence on Choice				
Non-health based	212(80.6)	51(19.4)			No response	123(95.3)	6(4.7)	18.7	0.002*
Residence					Price	33(89.2)	4(10.8)		
On campus	118(79.2)	31(20.8)	0.001	0.9	Popularity	69(83.1)	14(16.9)		
Off campus	183(78.9)	49(21.1)			Taste	83(84.7)	15(15.3)		
Sponsorship					Ingredients	15(75.0)	5(25.0)		
Self	33(91.6)	3(8.3)	3.8	0.01*	Volume	9(64.3)	5(35.3)		
Parents	268(77.7)	77(22.3)			Knowledge				
					Unsatisfactory	256(85.0)	45(15.0)	5.6	0.02*
					Satisfactory	76(95.0)	4(5.0)		





**Table 5: Factors Associated with Practices of Energy Drinks Consumption**

Variable(s)	Practice of energy drink consumption				Variable(s)	Practice of energy drink consumption			
	n=381(%)		$\chi^2$	p-value		n=381(%)		$\chi^2$	p-value
	Unsatisfactory	Satisfactory					unsatisfactory		
Age (years)									
≤ 19	28(56)	22(44)	0.2	0.6					
>19	174(52.6)	157(47.4)							
Sex					Cigarette Smoking				
Male	91(46.9)	103(53.1)	5.9	0.02*	Yes				
Female	111(59.4)	76(40.6)			No	2(40)	3(60)	0.3	0.6
Ethnicity					Alcohol consumption				
Hausas	173(54.2)	146(45.8)	1.2	0.3	Yes	200(53.2)	176(46.8)		
Non- Hausas	29(46.8)	33(56.2)			No	5(41.7)	7(51.8)	0.6	0.4
Marital status					Source of Energy drinks information				
Unmarried	171(52.1)	157(47.9)	0.9	0.4	No source				
Married	31(58.5)	22(41.5)			Media	13(72.2)	5(27.8)	10.2	0.04*
Level of Study					Books	66(47.5)	76(53.5)		
Level 100	32(50.8)	31(49.2)	0.2	0.7	Friends	9(47.4)	10(52.6)		
>Level 100	170(53.5)	148(46.5)			Family members	96(60)	64(40)		
Faculty					Influence on Choice				
Health science based	73(61.9)	45(39.1)	5.4	0.02*	No response				
Non-health science based	129(49)	134(51)			Price	107(82.9)	22(17.1)	76.9	<0.001*
Residence					Popularity	15(43.2)	21(56.8)		
On campus	77(51.7)	72(48.3)	0.2	0.7	Taste	33(39.8)	50(60.2)		
Off campus	125(53.9)	107(46.1)			Ingredients	32(32.7)	66(67.3)		
Sponsorship					Volume	5(25)	15(35.7)		
Self	16(44.4)	20(55.6)	1.2	0.3	Knowledge	202(53)	179(47)		
Parents	186(53.9)	159(46.1)			Unsatisfactory	177(87.6)	25(12.4)	0.1	0.7
					Satisfactory	155(86.6)	24(13.4)		

**Discussion**

The general consumption of energy drinks has increased among university 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.<sup>7</sup> In Saudi Arabia, where 46% of respondents reported consumption of ED, in Nigeria, where 44.2% of the adolescents consumed ED, and among Turkish university students where 52.5% of students consumed ED.<sup>19</sup> Students interviewed in various studies reported either ever used or currently using energy drinks.<sup>6,20, 21,22</sup> 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. This is corroborated by the finding of 94.5% of the students interviewed by our study to report of having heard of energy drinks and the health consequences of energy drinks consumption. This study found out that the majority of the students (87.0%) had unsatisfactory knowledge of energy drinks. A study conducted in Kano reported that, 62.8% students to be aware of the contents of energy



drinks,<sup>6</sup> This study found a slightly higher proportion of students (65.6%) with awareness of the contents of the ED, It means that there was increased awareness of the contents of the ED over time. This finding however, differed from the finding of similar study in Pakistan in which slightly higher proportion of participants (69.9%) were aware of the exact meaning of energy drinks<sup>8</sup> Similar study in Saudi Arabia however, reported lower proportion.<sup>15</sup> The variable findings maybe related with the availability and popularity of various energy drinks in the markets, with popularity mainly promoted by the marketing section of the energy drink company which in some countries may be regulated and conducted with appropriate guidance of appropriate regulatory bodies and health authorities.

This, therefore calls for concerted efforts by the Kano health authority to ensure that advertisement is regulated and correct health information on proper utilization are appropriately passed to the populace. This can go a long way in reducing the future socio-economic burden that may be associated with unhealthy use of energy drinks. For example, an attempt to find out whether the students were aware of the health consequences revealed that most of them did not know much about that and this calls for the effective collaborative sharing of all the necessary information on such products to the consumers.

Looking at the pattern of consumption practices, with the finding by this study to be having up to 53% of the students with unsatisfactory practices of energy drink consumption, similar to the findings by a study conducted in Kano, Nigeria that revealed the pattern of consumption of energy drinks, with almost half of the study participants consuming energy drinks before breakfast.<sup>6</sup> Other studies conducted on the practice of energy drink consumption in Lebanon and Italy reported combining the use of energy drinks with alcohol.<sup>23,24</sup> The finding may not be similar with this study with about 18.4% only reporting to mix energy drink with alcohol, because alcohol is a culturally not an acceptable drinks in Kano and is seen as a sacrilege, therefore respondents are not likely to report drinking alcohol even if they do so as to meet up with the cultural expectations of the land. 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 in the morning, 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,<sup>11</sup> 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.

Majority of the respondents, 79% in this study had a negative attitude towards energy drinks consumption, lower than the finding of 46.3% with a negative attitude by a study conducted in Port Harcourt,<sup>3</sup> and 45.9% in Taiwan.<sup>20</sup> This may be related to the lower level of knowledge identified by this study which can have negative influence on attitude towards energy drinks consumption or the appropriate practice of energy drinks consumption. Though it may be explained based on the report of a study conducted in Saudi Arabia with the majority of college students reporting that energy drinks were a healthy choice for them, and 64.5% believed that energy drinks improved endurance<sup>7</sup> but 31.8% of the students interviewed in this study attribute the use of energy drinks to increasing their performance at school or otherwise. This highlights the needs for sustained behaviour change communication with appropriate and timely communication to the students and general population on the need to utilize the food pyramid made available by the experts in the field of non-communicable disease prevention and health promotion do adopt the dietary practice principle with daily calorie intake and moderation in consumption of various classes of food known to be associated with increased risk of obesity and other non-communicable diseases.

### Recommendations

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. In addition, public enlightenment programs through various mass media should be strengthened

### Limitations

Students Bayero University Kano may not be representative of all students in Nigeria with a particular variation in socio-cultural characteristics that may influence the consumption of energy drinks. The study design used can only give snap shot of what is happening and can only generate hypothesis as



regards knowledge, attitude and practice of energy drinks consumption.

**Conclusions**

Majority of the students who had unsatisfactory knowledge, 79% had a negative attitude towards energy drinks consumption with more than a half of the students (53%) having unsatisfactory practices satisfactory practices of energy drinks consumption.

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Nil

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