

# REPORT

# ENERGY DRINK

**Quantitative & Qualitative**

**Methods**

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**Part 1: A concise literature review with 10 references related to your topic. The references should be cited/mentioned in your review using Mendeley software and Chicago referencing style. Similarly, an appropriate bibliography is also required (All the things are covered in the last lecture)**

The authors of the survey under review state that EDs have such health benefits as *improving mental and physical stamina among both adults and adolescents*. They highlight that EDs consumption *improved muscle strength and endurance, performance on endurance exercise tests, jumping, and sport-specific actions*. (Al-Shaar et al. 2017)(1)

This research emphasizes that people consume energy drinks during various occasions but mostly while *partying and socialising with friends or family or taking exams*. Children's motives included *taste, curiosity, friends drinking EDs, and parental approval or disapproval*. (Dylan Kneale Ginny, Brunton Gary Raine, Claire Stansfield, Amanda Sowden, Katy Sutcliffe 2021)(2)

In the main body of the article the authors focus on the main reasons of long-term EDs consuming which are *to stay awake (31%), to be more alert (14%), and to help with concentration when studying (15%) which is similar to other studies where 70% of students were consuming EDs for vitality and to be more alert (21%)*(Lucy Fernandes, Kebogile Mokwena 2020)(3)

The research under analysis raises the burning issue of advertising EDs among young generation. The scholars state that *appealing advertisements, strong branding, and reputation appeared to be key environmental stimuli for ED consumption* aimed at younger people.(Ghozayel et al. 2020) (4)

The authors of the present report focus not only on advantages of EDs but also on their disadvantages such as *cardiovascular manifestations like tachycardia, elevated blood pressure, arrhythmias, electrocardiographic changes and myocardial ischemia*. *On the nervous system, EDs affect cognition, mental health and motor skills, and they may increase the risk adventures*. *Prenatal consumption of EDs results in increased locomotion, anxiety and irritability of the newly born infants*. *Moreover, excessive ingestion of these drinks is associated with blood changes, renal and gastrointestinal disorders, obesity and dental caries*.(Haroun 2019)

The following survey emphasizes how important it is to know the effects of various ingredients of EDs on people's health. Thus, for example caffeine, which is the most widely studied ED ingredient, *has been shown to enhance alertness and mood, act as an ergogenic aid, and counteract symptoms of sleep loss and is associated with gastrointestinal upset, nausea, insomnia, spontaneous abortion, and withdrawal symptoms such as headache*.(Tracy Burrows, Kirrilly Pursey, Melinda Neve 2013)

The researches of the article affirm that over the past few decades EDs consumption has become a growing public health issue over the past few decades and nowadays about *one-third of teens from the ages of 12–17 also consume these beverages regularly and EDs has also become a widespread practice amongst adolescents and young adults.* (Amandeep Kaur<sup>1</sup>, Hamza Yousuf, Devyani Ramgobin-Marshall<sup>3</sup>, Rahul Jain 201)

This study clearly states that more and more people started consuming EDs more often due to multiple factors such as advertising, social media and environment. *The adolescents with frequent energy drink intake, in particular those who consumed energy drinks 5 or more days per week, also tended to reside in a rural area where access to healthy food are limited.* (Subin Park 2016)

#### Reference:

- 1) Al-Shaar, Laila, Kelsey Vercammen, Chang Lu, Scott Richardson, Martha Tamez, and Josiemer Mattei. 2017. "Health Effects and Public Health Concerns of Energy Drink Consumption in the United States: A Mini-Review." *Frontiers in Public Health*. <https://doi.org/10.3389/fpubh.2017.00225>.
- 2) Amandeep Kaur<sup>1</sup>, Hamza Yousuf, Devyani Ramgobin-Marshall<sup>3</sup>, Rahul Jain, Rohit Jain<sup>5</sup>. 2021. "Energy Drink Consumption: A Rising Public Health Issue." <https://www.imrpress.com/journal/RCM/23/3/10.31083/j.rcm2303083/htm>.
- 3) Dylan Kneale Ginny, Brunton Gary Raine, Claire Stansfield, Amanda Sowden, Katy Sutcliffe, James Thomas. 2021. "Consumption and Effects of Caffeinated Energy Drinks in Young People: An Overview of Systematic Reviews and Secondary Analysis of UK Data to Inform Policy." <https://bmjopen.bmj.com/content/12/2/e047746>.
- 4) Ghazayel, Malake, Ali Ghaddar, Ghada Farhat, Lara Nasreddine, Janine Kara, and Lamis Jomaa. 2020. "Energy Drinks Consumption and Perceptions among University Students in Beirut, Lebanon: A Mixed Methods Approach." *PLOS ONE* 15 (4): e0232199. <https://doi.org/10.1371/journal.pone.0232199>.
- 5) Haroun, Heshmat SW. 2019. "Energy Drinks: Pros and Cons." <https://medcraveonline.com/MOJAP/energy-drinks-pros-and-cons.html>.
- 6) Lucy Fernandes, Kebogile Mokwena, Busisiwe Ntuli. 2020. "Case Report on Energy Drink Consumption among Health Sciences University Students in Gau" Lucy Fernandes, Kebogile Mokwena, B. N. (2020). Case Report on Energy Drink Consumption among Health Sciences

University Students in Gauteng Province, South Africa. Ht.”

<https://publichealthreviews.biomedcentral.com/track/pdf/10.1186/s40985-020-00129-2.pdf>.

7)Subin Park, Yeeun Lee & Junghyun H. Lee. 2016. “Association between Energy Drink Intake, Sleep, Stress, and Suicidality in Korean Adolescents: Energy Drink Use in Isolation or in Combination with Junk Food Consumption.” <https://nutritionj.biomedcentral.com/articles/10.1186/s12937-016-0204-7>.

8)Tracy Burrows, Kirrilly Pursey, Melinda Neve, and Peter Stanwell. 2013. “What Are the Health Implications Associated with the Consumption of Energy Drinks? A Systematic Review.”

☆	●	Al-Shaar,Laila; Vercammen,Kelsey; Lu,...	Health effects and public health concerns of energy drink consumption in the United States: A...	2017	Frontiers in Public Health	5:40pm
☆	●	Dylan Kneale Ginny, Brunton Gary Raine,Clair...	Consumption and effects of caffeinated energy drinks in young people: an overview of systemati...	2021		5:40pm
☆	●	Lucy Fernandes,Kebogile Mokwena,Busisiwe Ntuli	Case report on caffeinated energy drinks in young people: an overview of Lucy ...	2020		5:42pm
☆	●	Ghozayel,Malake; Ghaddar,Ali; Farhat,Gha...	Energy drinks: secondary analysis of UK data to inform policy	2020	PLOS ONE	5:44pm
☆	●	Haroun,Heshmat SW	Energy drinks: pros and cons	2019		5:47pm
☆	●	Tracy Burrows,Kirrilly Pursey,Melinda Neve,an...	What are the health implications associated with the consumption of energy drinks? A systematic ...	2013		5:49pm
☆	●	Amandeep Kaur1,Hamza Yousuf,Devayani Ramgob...	Energy drink consumption: a rising public health issue	2021		5:54pm
☆	●	Subin Park,Yeeun Lee & Junghyun H.Lee	Association between energy drink intake,sleep, stress,and suicidality in Korean adolescents: ene...	2016		5:55pm

## Part 2: Your research topic and research question including the appropriate surveys.

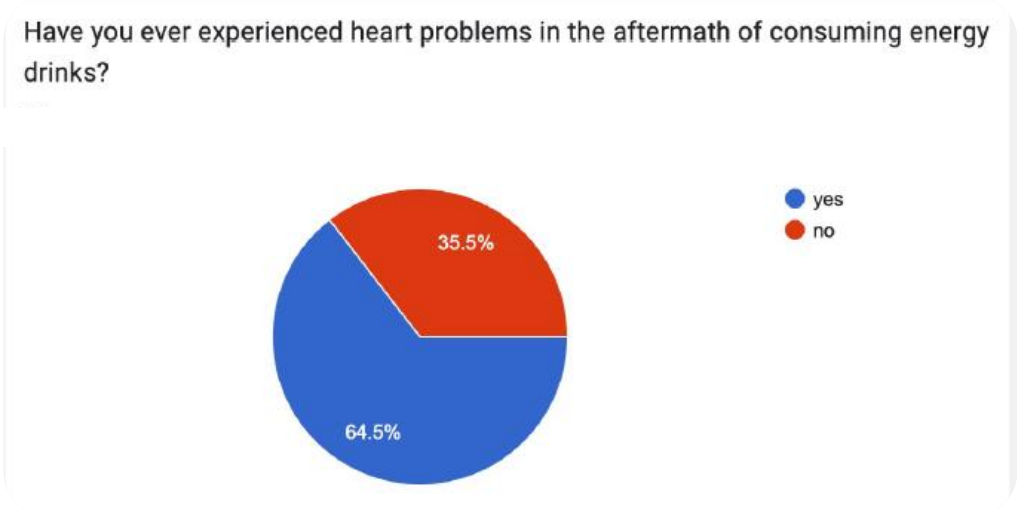
### OVERVIEW

Topic: Implications of energy drinks on mental and physical health The purpose of this work was to determine and provide an answer to our research question if energy drink consumption has a positive impact on people and how they affect their mental and physical health. These beverages have some known and discussed side effects by the medical society. Regarding their immediate health and long-term implications for diseases related to high blood pressure (due to the function of energy drinks in the body) . We started looking for an answer through means of surveys and forecasting how the information we seek to obtain will allow us to make an educated assumption on the matter and either accept or reject our hypothesis.

SURVEY MAIN QUESTIONS:

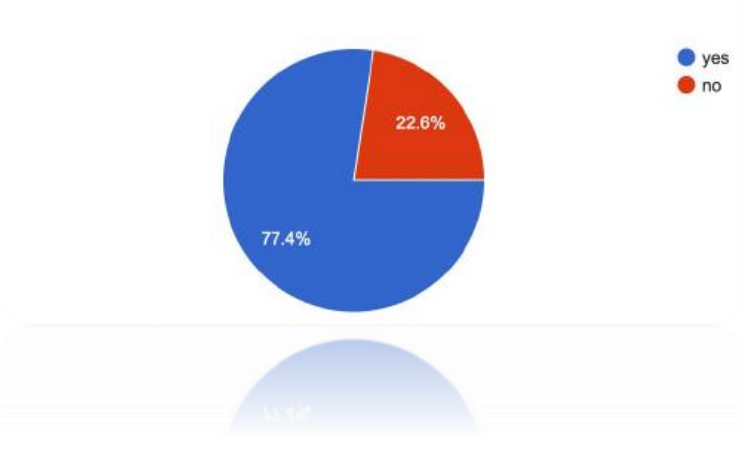
“THOSE ARE THE MOST IMPORTANT QUESTIONS THAT HELPS US TO CONSIDER HOW ENERGY DRINKS EFFECT ON PEOPLE”

As we can see most of participants have encountered with heart problems consuming energy drinks

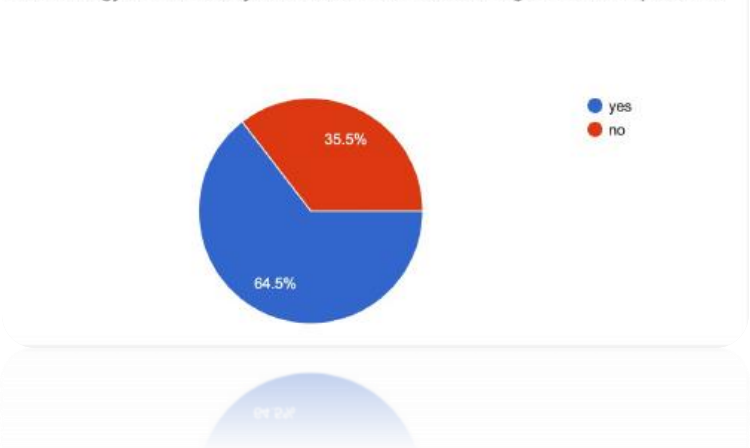


Users believe, the consumption of energy drinks will enhance their performance, by physically increasing there blood pressure so their heart and brain can "function faster". Also is it prompt to iterate the factors such as promoted effects influence with the usage of these beverages for affecting their bodies positively.

Do you drink energy drinks the night before an important event?



Does energy drinks make you more attentive considering educational proceses?



### Part 3: Your statistical analysis using two analysis techniques (any two from t-test, z-test and ANOVA) of your choice. You need to compare the analysis of the two techniques and comment which one is more suited for your study. Also, you need to discuss the conclusions of your analysis.

#### Comparison

Analysts use the ANOVA test to determine the effect of independent variables on the dependent variable in a regression study.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
at what age did you first start consuming energy drinks?	Would you like to know about the harm of energy drinks on your body?	Have you ever felt anxious after drinking an energy drink?	Have you ever experienced heart problems in the aftermath of consuming energy drinks?	On what occasions do you use energy drinks?	how you feel during an energy drink effect?	Does energy drinks make you more attentive considering educational process?	How much money do you spend per month on energy drinks?	How well do you think you know about the effects of energy drinks on the human body?	How were you first introduced to energy drinks?	Do you presently consume or use energy drinks?	For what activities would you use energy drinks? (Select all that is applicable to you)	How positive is your attitude to energy drinks?	Do you drink energy drinks the night before an important event?	Considering your complete knowledge about the benefits of energy drinks, how likely would you be to recommend a friend or colleague to start consuming one? 1 is Very Unlikely to 10 Very Likely	When you think about energy drinks what is the BRAND NAME that comes FIRST to your mind?	How often do you purchase energy drinks?
18-30	Yes	yes	yes	Before deadlines, es	6 yes	less than 25 euro	I don't know about it	Familiar	yes	Exercising	7 yes	7 yes	7 yes	7	7	Once a week
18-30	Yes	yes	yes	at parties/or after pc	6 yes	less than 25 euro	I don't know about it	Familiar	yes	Studying	7 yes	7 yes	7 yes	6	6	Once a week
18-30	Yes	yes	yes	Before deadlines, es	7 yes	less than 25 euro	I don't know about it	Advertising and acq	yes	Studying	7 yes	7 yes	7 yes	7	7	Once a week
30-45	No	no	no	At work	7 yes	less than 25 euro	I don't know about it	Advertising and acq	yes	Studying	7 yes	7 yes	7 yes	10	10	Once a week
30-45	No	yes	yes	Before deadlines, es	7 yes	less than 25 euro	I don't know about it	Advertising and acq	yes	Studying	7 yes	7 yes	7 yes	6	6	6+ times a week
18-30	Yes	yes	yes	at parties/or after pc	7 no	more than 50 euro	I don't know about it	Advertising and acq	yes	Studying	7 yes	7 yes	7 yes	6	6	Once a month
18-30	Yes	yes	yes	at parties/or after pc	2 yes	less than 25 euro	I know about the rol	Advertising and acq	yes	Studying	7 yes	7 yes	7 yes	4	4	4
18-30	Yes	yes	yes	Before deadlines, es	8 no	less than 10 euro	I know about the rol	Advertising and acq	yes	Studying	6 no	6 no	6 no	5	5	Once a month
18-30	Yes	yes	yes	Before deadlines, es	8 yes	less than 25 euro	I know about the rol	Advertising and acq	yes	Sports	10 yes	10 yes	10 yes	7	7	Once a month
18-30	Yes	yes	yes	Before deadlines, es	6 no	less than 10 euro	I know about the rol	Advertising and acq	yes	Sports	1 no	1 no	1 no	9	9	Once a month
14-18	Yes	no	no	Before deadlines, es	6 no	less than 25 euro	I know about the rol	Influenced by strang	yes	Studying	6 yes	6 yes	6 yes	2	2	Once a week
18-30	No	yes	yes	Before deadlines, es	1 no	less than 25 euro	I know about the rol	Advertising and acq	yes	Exercising	2 yes	2 yes	2 yes	6	6	2.5 times a week
18-30	Yes	yes	yes	Before deadlines, es	5 yes	less than 25 euro	I know about the rol	Advertising and acq	yes	Studying	8 yes	8 yes	8 yes	6	6	Once a week
14-18	No	yes	no	No need special oc	6 no	less than 25 euro	I know about the rol	Influenced by strang	yes	Leisure consumption	8 no	8 no	8 no	4	4	2.5 times a week
18-30	Yes	no	no	Before deadlines, es	7 yes	less than 25 euro	I know about the rol	Advertising and acq	yes	Sports	9 yes	9 yes	9 yes	7	7	Once a week
18-30	Yes	no	no	Before deadlines, es	6 yes	less than 10 euro	I know about the rol	Advertising and acq	yes	Sports	7 no	7 no	7 no	8	8	Once a month
18-30	Yes	no	no	No need special oc	7 no	less than 25 euro	I know about the rol	Advertising and acq	yes	Sports	5 no	5 no	5 no	5	5	2.5 times a week
14-18	Yes	yes	yes	At work	6 yes	less than 25 euro	I don't know about it	Advertising and acq	yes	Sports	7 yes	7 yes	7 yes	7	7	Once a month
18-30	No	yes	yes	No need special oc	10 yes	more than 50 euro	I know about the rol	Advertising and acq	yes	Studying	10 yes	10 yes	10 yes	10	10	2.5 times a week
18-30	No	yes	yes	No need special oc	6 yes	less than 50 euro	I know about the rol	Advertising and acq	yes	Leisure consumption	10 yes	10 yes	10 yes	10	10	2.5 times a week
14-18	Yes	yes	yes	at parties/or after pc	6 yes	less than 25 euro	I know about the rol	Advertising and acq	yes	Sports	7 yes	7 yes	7 yes	7	7	Once a week
18-30	Yes	yes	yes	Before deadlines, es	10 yes	less than 25 euro	I don't know about it	Advertising and acq	yes	Sports	3 yes	3 yes	3 yes	8	8	Once a week
30-45	Yes	yes	yes	Before deadlines, es	4 yes	less than 50 euro	I know about the rol	Advertising and acq	yes	Exercising	4 yes	4 yes	4 yes	1	1	24 2.5 times a week
18-30	No	yes	yes	No need special oc	5 no	less than 25 euro	I don't know about it	Advertising and acq	yes	Studying	6 no	6 no	6 no	4	4	24 Once a month
18-30	Yes	yes	yes	Before deadlines, es	7 yes	less than 50 euro	I know about the rol	Advertising and acq	yes	Sports	5 yes	5 yes	5 yes	5	5	24 2.5 times a week
18-30	Yes	yes	yes	Before deadlines, es	6 yes	less than 25 euro	I don't know about it	Advertising and acq	yes	Sports	5 yes	5 yes	5 yes	5	5	Once a week
18-30	Yes	yes	yes	Before deadlines, es	5 no	less than 10 euro	I know about the rol	Advertising and acq	yes	Sports	6 yes	6 yes	6 yes	6	6	24 Once a month

In our case, we conducted two analytic tests using ANOVA which answers the question why.

1) Because ANOVA test is usually used when there are a lot of variables i.e. more than 2x, we initially took three variables as "Positive effect", "Neutral effect", "Negative effect".

Does energy drinks make you more attentive considering educational process?	Do you presently consume or use your energy drinks?	How positive is your attitude to energy drinks?	Positive	Would you like to know about the harm of energy drinks on your body?	How much money do you spend per month on energy drinks?	How often do you purchase energy drinks?	What quality of energy drinks do you prefer to buy?	Neutral	How well do you think you know about the effects of energy drinks on the human body?	Do you drink energy drinks the night before an important event?	Have you ever felt anxious after drinking an energy drink?	Have you ever experienced heart problems in the aftermath of consuming energy drinks?	Negative
1	1	1	1	4	1	1	1	4	1	0	0	0	1
1	1	1	1	4	1	1	1	4	0	0	0	0	0
1	1	1	1	4	1	1	1	3	0	0	0	0	0
1	0	1	1	3	0	0	1	3	0	0	1	0	1
1	1	1	1	4	0	1	1	2	1	0	0	0	1
1	1	1	1	4	0	1	1	3	1	0	0	0	1
1	1	1	1	4	0	1	1	1	0	0	0	0	0
1	0	0	1	2	1	1	1	4	0	0	0	1	1
0	1	1	0	2	1	1	0	2	1	0	0	1	2
1	1	1	0	2	1	1	1	3	1	1	0	1	3
1	1	1	1	4	1	1	1	1	0	0	0	0	1
1	0	0	0	1	1	1	1	2	1	1	1	0	2
1	1	1	1	3	1	1	1	4	1	0	1	1	3
1	1	1	1	4	1	1	1	4	1	0	1	1	3
1	1	1	1	4	1	1	1	3	1	1	1	1	4
1	0	0	0	1	1	1	1	2	1	0	0	0	0
1	1	1	1	4	0	0	0	1	1	0	0	0	1
1	1	1	1	4	0	0	0	0	0	1	0	0	1
1	1	1	1	4	0	0	0	0	0	1	0	0	1
1	1	1	1	4	1	1	1	4	1	0	0	0	1
0	0	1	1	2	1	1	0	1	0	0	0	1	3
0	0	1	1	2	0	0	0	0	4	1	1	1	1
0	1	0	0	2	1	1	1	4	1	1	0	1	3
1	1	1	1	4	1	1	1	3	0	0	0	0	0
1	1	1	1	4	1	1	1	0	0	0	0	0	0
0	0	1	1	2	1	1	1	4	1	0	0	0	1
0	0	1	1	2	0	0	0	0	4	1	1	1	1
0	0	1	1	2	1	1	1	4	1	0	0	0	0
0	0	1	1	2	1	1	1	4	1	0	0	0	0
0	0	1	1	2	1	1	1	4	1	0	0	0	0
0	0	1	1	2	1	1	1	4	1	0	0	0	0
0	0	1	1	2	1	1	1	4	1	0	0	0	0

2) Since we needed to compare two methods of data analysis, we reduced the variables into two, "Positive" "Negative" and used Z-test to compare the final result of the hypotheses.

how you feel during an energy drink effect?	Does energy drinks make you more attentive considering educational process?	Do you presently consume or use energy drinks?	How positive is your attitude to energy drinks?	Would you like to know about the harm of energy drinks on your body?	How much money do you spend per month on energy?	Positive	How often do you purchase energy drinks?	What quality of energy drinks do you prefer to buy?	How well do you think you know about the effects of energy drinks on the human body?	Do you drink energy drinks the night before an important event?	Have you ever felt anxious after drinking an energy drink?	Have you ever experienced heart problems in the aftermath of consuming energy drinks?	Negative
1	1	1	1	1	1	6	0	0	0	1	1	1	3
1	1	1	1	1	1	6	0	0	0	1	1	1	4
1	1	1	1	1	0	5	0	0	1	1	1	1	4
1	0	1	1	1	0	4	0	0	1	1	0	1	3
1	1	1	1	1	0	4	0	0	0	1	1	1	3
1	1	1	1	1	0	5	0	0	0	1	1	1	3
1	1	1	1	1	1	5	1	1	1	1	1	1	6
1	0	0	1	1	1	4	0	0	1	1	1	0	3
0	1	1	0	0	1	4	1	1	0	1	1	1	4
1	0	0	1	1	1	4	0	0	0	0	1	0	4
1	1	1	1	1	1	6	0	1	1	0	1	1	4
1	0	0	0	0	1	3	0	0	1	0	0	1	3
1	0	1	1	1	1	5	0	0	0	0	1	0	1
1	1	1	1	0	0	2	1	0	0	1	1	1	4
1	1	1	1	1	1	6	0	0	0	1	1	1	3
1	0	1	1	1	0	4	0	1	0	0	1	0	3
1	1	1	1	1	1	6	0	0	0	0	1	0	1
1	1	0	1	1	1	5	0	1	0	0	0	0	1
1	0	0	0	0	1	3	1	1	1	0	0	0	2
1	1	1	1	1	1	6	0	0	1	1	1	1	4
1	1	1	1	1	0	4	1	1	0	1	1	1	4
1	1	1	1	1	1	6	0	0	0	1	1	1	3
0	1	1	1	1	1	5	0	1	1	1	1	1	4
0	0	1	1	1	1	3	1	1	0	1	1	1	5
1	0	0	1	1	1	4	0	0	0	0	1	1	1
1	1	1	1	0	0	3	1	1	0	1	1	1	5
1	0	0	1	1	1	4	0	0	0	0	1	1	1
0	1	1	1	0	1	4	0	1	1	1	1	1	5
0	1	1	1	0	1	5	0	1	1	1	1	1	5
0	0	0	1	1	1	4	0	0	0	1	1	1	5

Response values were varied depending on the question asked. When the question had a more positive bias the positive value was higher (1) and the negative value lower (0) while when the question was negative the negative value (1) was higher and the positive value lower (0)

In our survey, we added 3 types of positive, neutral, and negative questions from the start.

The answers to the questions were more of a "more-less" "yes or no" but their value depended on the questions. For example: In the positive question the high value was 1, and in the negative question the high value was also 1 but with a negative influence meaning. So we were able to find the correct value for each of the 3 declensions by their values.

## Results

At the end of our data analysis, the two methods of analysis showed us that the hypothesis to which we adhered was correct. We see that the P-value is below the standard alpha level of 0.05 and the F-value is above the F-crit.

Anova: Single Factor						
Summary						
Groups	Count	Sum	Average	Vatience		
Positive	31	140	4.516129	1.258064516		
Negative	31	99	3.193548	1.961290323		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F critical
Between Groups	27.11290323	1	27.1129	16.84368737	0.000124381	4.001191377
Within Groups	96.58064516	60	1.609677			
Total	123.6935484	61				

Because of these two results, we can reject the null hypothesis. This picture showed that most of the people who took the questionnaire are more inclined that energy drinks are useful and have a positive effect on their life. From this, we can conclude for commercial purposes that these people are most likely to continue to drink caffeinated drinks in the future in spite of the negative effects on health.