

Effects of red bull on young adults



**ASSIGN
BUSTER**

Research Proposal

Aims

The aim of this study is to investigate the acute effects of drinking a can of Red Bull, which includes taurine and caffeine, on heart rate and blood pressure in healthy young adults. It is hoped that this study will lead to the mandatory regulation of the amount of caffeine contained in all energy drinks and the mandatory inclusion of a warning label on every can to hopefully eliminate adverse effects due to the overconsumption of energy drinks.

Introduction

Energy drinks such as Red Bull®, V®, Rockstar® and Mother® are caffeinated beverages promoted for improving physical performance, concentration, endurance and also being beneficial in increasing stamina. Young adults, especially students and athletes, are the target of advertising campaigns by companies that manufacture these beverages. Energy drinks account for approximately 20 per cent of beverages sold in Australian convenience stores. The Food Regulation Standing Committee found that energy drinks sales in Australia and New Zealand have increased from 34.5 million litres in 2001 to 155.6 million litres in 2010.

Energy drinks contain varying quantities of caffeine (80–500 mg), taurine (1000–2000 mg), guarana, amino acids, sugar and vitamins. Caffeine is the most commonly consumed stimulant drug worldwide, with approximately 90% of adults regularly consuming it, but unlike many other stimulant drugs,

it is legal and unregulated worldwide. At the cellular level, caffeine increases intracellular calcium and releases noradrenaline and intensifies dopamine receptors with stimulation of the cardiovascular system as well as the brain's respiratory and vasomotor centers. In healthy adults, a caffeine intake of ≤ 400 mg/day is considered safe and not likely to result in any adverse effects. Additional amounts of caffeine are often found in energy drinks through additives, including guarana, cocoa, yerba mate, and kola nut. Guarana is a plant that contains caffeine. 40 to 80 mg of caffeine can be contained in each gram of guarana and it may also have a longer half-life due to interactions with other plant compounds. However, these ingredients are not required to be listed under the caffeine content by manufacturers thus the actual caffeine dose in a single serving may exceed that listed on the can.

Taurine is one of the most abundant amino acids in the human body. It is also naturally present in our diet as it is contained in meat and seafood. Taurine is also synthesized in the liver from the amino acid cysteine, as well as from other sulphur compounds. It is present in relatively high amounts in skeletal and cardiac muscle and it is involved in the formation of bile salt, neuronal excitability, cell membrane stability and the modulation of calcium flow. There is no evidence of adverse effects in humans in short term studies with large daily doses (6000 mg per day for 42 days) of Taurine.

Both caffeine and taurine have been shown to have direct effects on cardiac function and hemodynamic status. A pilot study on healthy volunteers in the United States found that one can of Red Bull containing 80 mg of caffeine increased BP compared to 80 mg of caffeine alone. Another study

<https://assignbuster.com/effects-of-red-bull-on-young-adults/>

investigated the effects of energy drink consumption on hemodynamic and electrocardiogram (ECG) parameters in healthy young adults and reported a significantly increased heart rate and blood pressure within 4 hours (Steinke and Lanfear). In another study, the influence of a multi constituent energy drink and its individual ingredients on the heart was compared and found that stroke volume and diastolic intake velocity were significantly increased in the red bull group compared to a similar drink that contained caffeine but not taurine.

A poisons information line in NSW reported almost 300 cases of toxicity due to energy drink consumption, with the average age being 17 years old and the average number of drinks consumed in one session being 5. The most common physical effects reported included peripheral vasodilation, palpitations, agitation, tremor, insomnia and gastrointestinal upset. 128 people were hospitalized and 21 people had symptoms of serious neurological or cardiac toxicity. Most worrying is the growing trend of young people combining these energy drinks with alcohol. Research from the United States has shown that individuals who combine alcohol and caffeinated energy drinks consume more alcohol more often compared to individuals who don't consume alcohol and caffeinated energy drinks. It has also shown that there is a significantly higher prevalence of alcohol related consequences, including alcohol poisoning, impaired driving, physical injury, and sexual victimisation.

Energy drinks have previously been classified and marketed as dietary supplements, which have minimal regulation. Canada has recently changed their classification to foods which have tighter regulations. It is time that

<https://assignbuster.com/effects-of-red-bull-on-young-adults/>

energy drinks are subjected to greater regulation worldwide, this includes regulating the amount of caffeine in a single serving. Only a few energy drinks have a fine-print warning label, which state that they may not be safe for children, caffeine sensitive individuals, or for pregnant or nursing women however this is not mandatory it is up to the company to add this.

It should be noted that, although energy drinks have been sold worldwide for more than a decade, only a few published studies have examined their effects on health and well-being. However, studies have not been conducted on an isolated island population with a defined population such as this.

Research Plan/ Methods

Participants

The participants for this study are healthy young adult Islanders from a virtual environment called The Island. The Island provides a unique sample population. 30 Islanders either gender, aged 18–30 years will be selected at random using a random number generator and asked if they would like to participate in the study. A minimum and a maximum will be entered into the random number generator for the number of towns on the island, the number of houses in the town were and also for the number of residents in the house if more than one resident aged 18–35 years old lives in that particular house. The study will be unblinded. Each resident will be assigned a number from 1–30 with numbers 1–10 receiving the placebo, which contained no caffeine or other stimulant, and thus the control group, numbers 10–20 receiving the 1 Red Bull (80 mg of caffeine) and numbers 20–30 receiving 5 Red Bulls (400 mg of caffeine). Subjects have to meet a set of

<https://assignbuster.com/effects-of-red-bull-on-young-adults/>

inclusion criteria obtained by a medical history/ task history examination
blood pressure < 120/80 mmHg, non-smoking, absence of systemic diseases
(including hypertension, diabetes, or vascular disease), evidence of
abstinence from caffeine or caffeine beverages, and abstinence from use of
any systemic drugs and/or alcohol. Subjects will be excluded if they have
blood pressure outside the specified range, are smokers, if they have a
systemic disease, if they have recently ingested caffeine, drugs or alcohol.

Instruments

Brachial artery systemic blood pressure will be assessed by automated
sphygmomanometry and pulse rate will be measured using a heart rate
monitor.

Procedure

Three solutions were administered: Placebo and Energy drinks with 80 mg
and 400 mg of caffeine. As a control, 10 of the subjects were required to
consume 250 mL of water. Of the two groups consuming the energy drinks
one group will be required to drink 1 red bull which contains 80mg caffeine
and 1000mg Taurine per 250ml and other group will be required to drink 5
Red Bulls which contains 400 mg caffeine and 5000mg Taurine per 1250ml.
The reason we chose the two different doses of Red Bull are due to claims by
Red Bull that 1 can of Red Bull contains the same amount of caffeine as a
regular cup of coffee, which is 80mg. An extensive review of the scientific
literature on caffeine was conducted by Health Canada. They concluded from
the review that if the general population of healthy adults limit their
consumption of caffeine to 400 mg per day they will not be at risk of any
<https://assignbuster.com/effects-of-red-bull-on-young-adults/>

potential adverse effects thus we decided to use a maximum dose of 5 Red Bulls even though there is a warning to not have more than two 250ml cans per day. Measurements of BP and pulse rate were performed before (resting baseline) and after (30, 60, 90 min) ingestion of each of these solutions.

Statistical Analysis

The results for all subjects for each group, at each time point, will be combined and presented as the means \pm standard deviation, to allow for statistical comparison. A one way analysis of Variance (ANOVA) will be used to see if there is any difference between all the measured variables.

Statistical analysis of the data was performed with SPSS 16.0 software (SPSS Inc., Chicago, IL, USA). *P*-values less than 0.05 were considered as statistically significant.

Significance

It is expected that both doses of red bull will increase heart rate and systolic and diastolic blood pressure when compared to the control group however a larger response is expected in the group who consumed 5 cans of red bull. .

It is hoped that this study will lead to the mandatory regulation of the amount of caffeine contained in all energy drinks and the mandatory inclusion of a warning label on every can to hopefully eliminate adverse effects due to the overconsumption of energy drinks.

References

1. Franks AM, Schmidt JM, McCain KR, et al. Comparison of the effects of energy drink versus caffeine supplementation on indices of 24-hour ambulatory blood pressure. *Ann Pharmacother* 2012; 46: 192-199.
2. Gunja N and Brown JA. Energy drinks: Health risks and toxicity. *Med J Aust* 2012; 196: 46-49.
3. Koczwara K. Moms talk: Are energy drinks safe for teens? *Fountain Valley Patch* , April 26, 2012.
4. Knowler W. Energy drinks must now carry warnings. *Independent Online* , May 3, 2012.
5. Szotowska M, Bartmanska M, Wyskida K, et al. Influence of “ energy drinks” on the blood pressure and the pulse rate in healthy young adults. *J Hypertension* 2012; 30: e369.
6. Wolk BJ, Ganetsky M, Babu KM. Toxicity of energy drinks. *Curr Opin Pediatr* 2012; 24: 243-251.
- 7.

FINER

Feasible

This study is feasible as it has an adequate number of subjects and as the sample size is small, the cost of the trial is reduced. This study also has adequate expertise in the field as all staff members have been instructed by experts in the field on how to use the instruments used to measure heart rate and blood pressure. A nurse will also be present during all experimental procedures to ensure the health and safety of all the subjects. James Baglin who is a statistician at RMIT will be assisting with the statistical analysis of <https://assignbuster.com/effects-of-red-bull-on-young-adults/>

the results. The scope of the study is manageable as the experimental procedure only goes for 90 minutes therefore subjects do not have to do repeat testing after this time. Islanders are also easy to contact and find on the Island. This study will be funded by the National Health and Medical Research Council thus lack of funding will not be an issue.

Interesting

The study will be hopefully be able to shine a light on the dangers of caffeine in energy drinks in a sample population which is of great benefit to researchers and experts alike and also to the community.

Novel

Only a few published studies have examined the effects of energy drinks on health and well-being. However, studies have not been conducted on an isolated island population with a defined population such as this.

Ethical

All of the studies participants are healthy young adults aged between 20-35 years who have consented to be in our study. No children, disabled, senior, mentally or physically ill Islanders have been included in the study. There also aren't any vulnerable islanders or islanders in dependant relationships in this study. This study is categorised as risk 2 –non invasive project as the subjects will be receiving either red bull or placebo and heart rate and blood pressure will be measured over a period of 90 mins. Participants are also not payed in this study.

Relevant

It is hoped that this study will lead to the mandatory regulation of the amount of caffeine contained in all energy drinks and the mandatory inclusion of a warning label on every can to hopefully eliminate adverse effects due to the overconsumption of energy drinks.