

HABITS OF ENERGY DRINK CONSUMPTION AMONG TEENS IN SLOVENIA - FOCUS GROUP FINDINGS

NAVADE UŽIVANJA ENERGIJSKIH PIJAČ MED MLADOSTNIKI V SLOVENIJI - IZSLEDKI FOKUSNIH SKUPIN

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ABSTRACT

Introduction: Teachers in Slovenia have been noticing the increased consumption of energy drinks among pupils. Therefore, the purpose of this study was to investigate habits that contribute to the frequency of energy drink consumption.

Keywords:

energy drinks, teens, habits, Slovenia

Method: 36 teens participated in the study: elementary school pupils (6th and 8th grades), general upper secondary school pupils, and secondary technical school pupils (1st and 3rd year). In the course of the study 6 group interviews were held to help investigate young people's habits and their reasons for energy drink purchase and consumption. Moreover, we investigated the influence of age on the consumption and knowledge about energy drink ingredients, as well as their influence on the body.

Results: Interview analysis showed that energy drink consumers are predominantly secondary school pupils. Their choice most frequently depends on the price, their taste, or the brand. What influences elementary school pupils' purchasing decisions are price, packaging, and advertisements, while secondary school pupils choose their drinks according to the lack of energy and how tired they feel. The predominant factors preventing energy drink consumption are health problems among family members and friends. Secondary school pupils know more about energy drink ingredients than elementary school pupils.

Conclusion: On the basis of these findings, we will design a survey questionnaire for Slovenian teenagers and teachers, didactic material, and suggestions for improving educational programmes.

IZVLEČEK

Namen: Učitelji v Sloveniji opažajo povečano uporabo energijskih pijač med mladostniki. Zato je namen in cilj te raziskave proučiti navade mladostnikov, ki prispevajo k pogostosti uživanja energijskih pijač.

Ključne besede: energijske pijače, mladostniki, navade, Slovenija

Metoda: V raziskavo je bilo vključenih 36 mladostnikov, ki obiskujejo 6. in 8. razred osnovne šole ter 1. in 3. letnik gimnazije in srednje strokovne šole. Opravili smo 6 skupinskih intervjujev, v katerih smo raziskovali navade ter razloge za uživanje in nakup energijske pijače, vpliv starosti na uživanje ter poznavanje sestavin energijskih pijač in njihovega vpliva na telo.

Rezultati: Analiza intervjujev je pokazala, da jih pogosteje uživajo srednješolci kot osnovnošolci. Za posamezni izdelek iz ponudbe se odločijo na podlagi cene, okusa ali poznavanja blagovne znamke. Pri nakupu bi osnovnošolce pritegnile cena, embalaža ter reklame, srednješolce pa še lastna povečana utrujenost in pomanjkanje energije. Kot najizrazitejši zaviralni dejavnik uživanja teh pijač so zdravstvene težave bližnjih in prijateljev. Srednješolci poznajo več sestavin energijskih pijač kot osnovnošolci.

Zaključek: Na podlagi naše raziskave bomo pripravili anketne vprašalnike za širšo raziskavo med slovenskimi mladostniki in učitelji, pripravili didaktično gradivo za to tematiko ter predloge za izboljšanje izobraževalnih programov.

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1 INTRODUCTION

1.1 Ingredients and their impact on health

Energy drinks usually contain caffeine, carbohydrates, water, taurine, glucuronolactone, a B-vitamin complex, artificial sweeteners, aromas, and other ingredients. Caffeine, a plant alkaloid from the group of substances named methylxanthine, is the most common substance contained in energy drinks. According to the International Convention on Psychotropic Substances it is classified in a group that can cause mental changes in all humans. Cocaine, nicotine, and morphine are classified in the same group (1).

Daily caffeine dosages from 100 to 250 mg are safe for healthy adults. Dosages exceeding 300 to 400 mg per day, depending on body weight and tolerance threshold, may however cause some undesirable effects such as: restlessness, anxiousness, insomnia, red patches on the skin, increased urination, vomiting, stomach problems, muscle cramps, heartbeat irregularities, and unconnected thought and speech. Regular consumption of 600 mg of caffeine per day may cause insomnia, constant anxiety, depression, feeling low, and stomach irregularities. 1000 mg of caffeine per day causes serious multi-system poisoning (vomiting, hallucinations, cerebral edema, stroke, paralysis, dysfunction of consciousness, attacks, cardiac arrhythmia), which may be fatal. The groups most exposed to risk are children, teens, and pregnant women. However, long-term intake of caffeine has also shown to be linked to a lower risk of colorectal cancer, prostate cancer, hepatocellular carcinoma, and other liver as well as cardio-vascular diseases, as well as a lower risk of Parkinson's, type II diabetes, and skin cancer (1-4).

There is also a link between consuming high concentrations of caffeine mixed with alcohol. Mixing energy drinks with alcohol causes cross-interactions and consumers are often unaware that this combination can cause alcohol poisoning. Both substances are diuretics. Alcohol metabolism is hindered, consequently leading to alcohol toxicity (5, 6). Energy drinks contain from 0 to 67 grams of carbohydrates (glucose and fructose) per 240 ml of beverage. According to the criteria of British Food Standard Agency (FSA), this classifies energy drinks among foods and beverages with high sugar content. Food and beverages containing more than 10 grams of sugar per 100 grams of product tend to fall into this group. The best-selling energy drink contains 11 grams of sugar per 100 ml of beverage, which equals six or seven teaspoons of sugar for a 250 ml can (1, 7-9). Sugary drink consumption is associated with obesity, dental cavities, type II diabetes, and cardiovascular diseases (8, 9).

Taurine is an amino acid present in the human body and in daily meals. It has not been proven to have any harmful effects on human health. The combination of taurine and

caffeine lowers the heart rate; however, after 70 minutes it normalises (10). Gluconolactone is a metabolic product of glucose in the liver. Not many studies have been carried out, but the available ones suggest that the human body can handle small amounts of the substance easily (11).

Healthy persons experienced increased systolic heart pressure (from 6 to 10 mm Hg) in the period of one to two hours after consuming an energy drink, as well as increased diastolic heart pressure (from 3 to 6 mm Hg) and increased heart rate (from 3 to 7 bpm) (12).

Atrial fibrillation was noted in healthy persons after consuming an energy drink. With consumption of several energy drinks in a short period of time, researchers noted ventricular arrhythmia (12, 13). Haemorrhage of coronary arteries is likely in healthy adults who drink between 2 and 8 energy drinks. Researchers have established a link between excessive consumption of energy drinks and epileptic seizures, reversible cerebral vasoconstriction, brain haemorrhage, acute kidney failure, rhabdomyolysis, metabolic acidosis, hyperinsulinemia (14, 15).

1.2 Factors of influence on young persons

There are numerous and varied factors influencing the choice and consumption of energy drinks. These are classified into internal and external factors. Internal factors regarding the choice refer to the person's character and their perceptive and cognitive processes. External factors refer to the features of the product (taste, smell, aroma, colour), as well as the social and cultural context (16).

One of the factors which influence energy drink consumption is lifestyle. Researchers established that energy drink consumption was linked to smoking, drinking alcohol, brawling, a risky sexual life, speeding without the use of a safety belt, driving under the influence of alcohol, not having health insurance, and drug addiction (10, 17-19).

A person's eating habits and status depend on their family's social-economic status. It is important for children to develop healthy eating habits in childhood and pre-teenage years, as this makes it more likely that they are going to have healthy eating habits as adults (20). After the age of 12, the chances of influencing eating habits and the choice of food and drinks is significantly lower than in younger years (21).

Researchers (10, 22-24) are underlining that a health and educational programme on energy drinks, their ingredients and the effects they have on human and teenagers' health, on risks connected to mixing energy drinks with alcohol and drugs, is very much required. Parents should be included in this education as well. Since young people often consume energy drinks due to tiredness, it is suggested to educate them about the impact of food and lifestyle on sleeping habits (25).

2 METHOD AND SAMPLE DESCRIPTION

2.1 Work method

The descriptive research method and causal non-experimental method were used to carry out the research (26). In order to perform a comprehensive and in-depth study with Slovenian teens, we used the qualitative method.

In the research segment of the study, we held partially structured focus groups with participating teens. The interviews took place in four steps: planning, obtaining participants, conducting interviews and collecting data, as well as analysing and interpreting the obtained data (27-31). In the planning phase we determined the main topic and subtopics, focus group goals, and potential participants. The subtopics were determined according to the goals and the literature available on the topic. Moreover, we planned a planned systematic course of interviews which could change depending on the answers of the teens. Since we wanted to compare the age and educational programmes, we decided to include one elementary school, one general upper secondary school, and one secondary technical school. We first contacted the headmasters of the above-mentioned schools and they agreed with the implementation and their pupils' participation. Next, the topic and the principle of the focus groups (the topic, time, place, audio recording) were presented to the teens. The pupils decided to participate in the survey in order to contribute to the study with their opinion and experience. The participation was their personal decision. Later, we got their parents' consent. Three researchers took part in the interview: one of them was objective and familiar with the topic, so he interviewed and motivated the pupils; the other two only listened to the interview. Interviews were recorded with a mobile phone and carried out in a vacant classroom in each of the schools, allowing the participants to focus on the answers without interrupting the academic process. On average, each interview was 45 minutes long.

This helped us gain a general overview of energy drink consumption in Slovenia.

2.2 Sample description

36 teens from 3 schools in Ljubljana were involved in the study in the form of focus groups - elementary school, general upper secondary school and technical secondary school. We carried out two focus groups in each of the schools. They were aged between 11 and 18 (the 6th and 8th grade of elementary school and the 1st and 3rd grades of secondary school). The details of the sample are shown in Table 1. Focus groups were carried out in February 2018.

2.3 Execution and topics of focus groups

Questions in the interviews were simple, easy to understand, straight forward, open-type questions and did not allow for simple yes/no answers, but rather encouraged descriptive answers. Participants sat in a circle and responded without particular order after a question was asked. Each participant was allowed to express their opinion and talk about their habits and observations. Moreover, they could agree or disagree with each other and cooperate. When enough answers were provided to a certain set of questions (the answers were either the same or the participants already expressed their opinion, experiences, agreement or disagreement), we continued with the following one.

In order to make the answering process and subsequent analysis, easier, participants were given small pieces of paper with numbers from 1 to 6 (6th grade and 1st form) and numbers 7 to 12 (8th grade and 3rd year).

The fundamental principles of the ethics code in social science research were respected in all phases of the project. All participants were informed about the study's content, purpose and course of conduct. Their anonymity and private data protection were assured. Schools and parents were informed that the data acquired in the study would be used solely for the purposes of the research.

Interview topics:

Table 1. Focus group structure.

Focus group (FG)	School	Grade	Number of participants	Number of participants by gender	
				Girls	Boys
FG 1	Elementary school	6	6	3	3
FG 2	Elementary school	8	6	3	3
FG 3	General upper secondary school	1	6	3	3
FG 4	General upper secondary school	3	6	3	3
FG 5	Secondary technical school	1	6	3	3
FG 6	Secondary technical school	3	6	3	3

1. Energy drink consumption habits
2. Encouragements and factors for purchasing and consuming energy drinks
3. Deterring factors for energy drink consumption
4. Knowledge of ingredients
5. Energy drink consumption and health

2.4 Analysing the data

The recorded notes of six focus group interviews were transcribed. They were processed in accordance with analysis guidelines (32-34), which involved the systematic examination of the transcripts. During each interview the interviewer and one of the listeners made short notes. After the interviews they listened to the recordings again and transcribed the entire interview. Next, they compared their notes, set the main subtopics, and categorised the answers as well as the main findings (i.e. How many elementary school pupils and how many secondary school pupils consume energy drinks?). Findings were analysed according to gender, age and educational programme.

3 RESULTS - GROUP INTERVIEW FINDINGS

3.1 Habits of energy drink consumption

Analysis of interview topics showed that no elementary school pupils drank energy drinks or mixed them with alcohol.

Participants from secondary schools (half of the boys on a regular basis, half of them several times a month; girls only occasionally or on special occasions) consume energy drinks after meals or as a separate drink. They tend to drink energy drinks at the end of the day, once they know they may need more energy for studying or working on the computer.

“I drink energy drinks after dinner if I am planning to do some studying” (boy, 3rd grade, no. 12, general upper secondary school).

A boy from the 3rd grade of general upper secondary school also drinks energy drinks mixed with alcohol. Another boy from the 3rd grade said that mixing energy drinks with alcohol did not make sense.

“I never mix energy drinks with alcohol, because it ruins the taste of each drink. I also wondering whether it is better to have a glass of wine with a meal instead of Coca-Cola” (boy, 3rd grade, no. 11, general upper secondary school).

A survey on eating habits among sixth graders in Slovenia revealed that 8.2% of pupils consume energy drinks once or several times a day, while 76.8% of them rarely or never consume them (35). In 2014, the Slovenian National Institute of Health Prevention (36) conducted a study

where it was noted that slightly over a third (36.3%) of young people (11-, 13- and 15-year-olds) consume energy drinks. The share of boys is significantly higher than that of girls. Energy drink consumption increases with age. In the group of 15-year-olds, almost every other person drinks energy drinks. A research of elementary school pupils' attitude towards energy drinks in 2019 showed that 45.7% of them never consume energy drinks, 4.9% of them consume them every day, and 7.4% consume them twice a week (37).

3.2 Encouragement and factors of purchase and consumption of energy drinks

When purchasing energy drinks, elementary school pupils are attracted by low price, packaging, and marketing. As to the low price criterion, they stated that they would buy an energy drink if it cost less than others available, on discount, or as part of a ‘two for the price of one’ purchase deal. As for packaging, they report that they would choose the packaging of a well-established brand, packaging that is colourful, has several colours, is larger, and that clearly states the flavour. The more unusual the flavour, greater the potential for purchase and tasting.

“Very low price, lower than the price of any other energy drink, brand logo on the can, for example Red bull®, slightly more colourful, with small print, so that I am unable to see the sugar content, marketing such as Red bull® gives you wings and other attractive slogans ... that would attract me to buy it” (boy, 6th grade, no. 1, elementary school).

Among the large range of energy drinks available, secondary school pupils most often decide based on familiarity with the brand, price, or flavour. When it comes to brands, they also mention Red bull®, because they are most familiar with it as it is the leading brand of energy drinks.

“Once I arrive at the shop, I have several scenarios. If I am alone and have a couple of coins, I'll buy the cheapest one. If I am with friends, I'll spend a little more and buy Red Bull® or Monster®” (boy, 3rd grade, no. 12, general upper secondary school).

“I prefer Rossi's Monster®, which reminds me of orange soda (OraTM). The taste masks all the rubbish, I like the aroma. If I don't have enough money, I just buy something else. I find Red Bull® too sweet to the point that you can't taste the flavour. I think that energy drinks such as Sbudget, or Hofer smell of chemicals” (boy, 3rd grade, no. 11, general upper secondary school).

Participants attending secondary schools state that the following encourages consumption: price, lack of energy, tiredness, school work to be done until late at night.

“When I have a snack at school, I always get an energy drink. I feel tired, it tastes good and does not cost much” (boy, 1st grade, no. 4, general upper secondary school).

“When I feel really sleepy, but know I still have work to do” (girl, 3rd grade, no. 19, general upper secondary school).

One of the pupils from the 3rd year of general upper secondary school states that he drinks energy drinks when he works on his computer late at night and not when he has to study like all other secondary school pupils stated. “I primarily drink if I have to do some work, but if I have to study, I don’t. For me, work means working on the computer, when I have to be concentrated and I feel sleepy and don’t have the same mental capacity as when I am rested. I do this kind of work until 3:00-3:30 at night and feel the consequences in the morning. I buy another energy drink at school so that I can make it through classes. I go to sleep in the afternoon and repeat everything at night. And I am in a vicious cycle” (boy, 3rd grade, no. 11, general upper secondary school).

On the grounds of the study, Verdeber (38) concluded that it is the sweetness of the drink that is often the reason for choosing drinks with added sugar, because young people link “good flavour” with the taste of sweetness. There are three other factors encouraging the purchase in addition to flavour, namely attractive packaging, colour of the drink, and the media.

3.3 Deterrent factors for energy drink consumption

Analysis of the interviews has shown that elementary school pupils trust their parents and teachers when they encourage them to choose healthier drinks. Moreover, they trust their warnings about fizzy, overly sweet energy drinks and alcohol. They would also be drawn away from energy drinks by certain strong marketing, which would clearly state why not to drink energy drinks and what happens after drinking them, along with global news articles about death caused by energy drinks. In order to completely stop drinking energy drinks, they would have to experience serious health deterioration themselves, or this would have to happen to one of their family members or friends.

Secondary school pupils agree with elementary school pupils but add that at their age a lot of decisions are made by themselves. Stronger promotion and marketing would be required for the promotion of healthy drinks. They also believe that they would certainly choose to buy healthy drinks more often, if they were less expensive.

Teenagers who participated in a focus group study in Great Britain suggested age limits, schemes that would involve sellers of energy drinks, and improved labelling as incentives to cut down on the purchasing and drinking of energy drinks (39).

Teens need the answers to their “why” and not only “how” questions. However, the manner of delivering these answers is of great importance. Teachers and healthcare workers should not moralize but give an objective and understandable explanation (40).

3.4 Knowledge of energy drink ingredients

Analysis of focus groups has shown that knowledge of energy drink ingredients tends to increase with age.

Three participants from the 6th grade only mentioned sugar, while others said that they did not know about the ingredients. The 8th-grade pupils however already mentioned colourings, aromas, fruit concentrates and extracts. Secondary school pupils have better knowledge of ingredients. In addition to those stated by the elementary school pupils, they also listed: preservatives, sweeteners, water, caffeine, aspartame, vitamin B, and acidity regulating agents, taurine.

Only 23.7% of secondary school pupils chose the correct response regarding energy drink ingredients, in which boys were better at choosing the correct answer (29.8%) than girls (19.2%) (41).

3.5 Energy drinks consumption and health

All elementary school pupils believe that energy drinks have an effect on people’s well-being and health, particularly when drinking them in excess.

“They cause diabetes, because they contain a lot of sugar. They say it is harmful for adults. What would happen if it were drunk by an adult who has an illness and needs medication and a certain diet? I really think such a person should not consume energy drinks” (boy, 6th grade, no. 6, elementary school).

Elementary school pupils stated heart diseases (stroke, fast heart rate), diabetes, effects on mental capacity, and ability to focus. Three of them also thought of a combination of energy drinks and different medications. They think that death is also one of the possible outcomes of such combinations.

All secondary school pupils believe that energy drinks are bad for their health because of the ingredients. They listed some diseases that could be caused by energy drink consumption: diabetes, cardiovascular disease, obesity, liver and intestine failure, cancer, addiction, irregular biorhythm, and hypertension.

On the basis of these findings, we will make a questionnaire for Slovenian teenagers and teachers, didactic material, and suggestions for improving educational programmes.

4 DISCUSSION

This qualitative study carried out in the form of focus groups with Slovenian elementary and secondary school pupils portrays their attitudes towards energy drinks. We can establish the following findings based on our research. The elementary school pupils included in the study do not drink energy drinks. However, they are often drunk by the secondary school pupils included in the study. They drink them as an individual drink, most often after dinner. We believe the results reflect the influence parents and teachers have on elementary school pupils; it is stronger than peer pressure. Parents have been influencing their children's eating habits since their childhood by setting an example. The same applies to the availability/unavailability of food at home; the first encourages and the latter limits certain food and drink consumption. With age, resistance to peer influence decreases and teens discuss the choice of food and drinks with their peers.

Elementary school pupils would be drawn to buying energy drinks because of low prices, packaging, and marketing. A smaller number of them stated they might also be persuaded by peers and unusual flavours. Participants from secondary schools also listed the following encouraging factors: price, lack of energy, tiredness, a night's worth of schoolwork. None of them mentioned the imagery, packaging, or marketing. Marketing is one of the factors that influence energy drink purchase with elementary school teens (a discount, special flavours, packaging). On the other hand, secondary school pupils buy and consume energy drinks in order to be more efficient with schoolwork and to be able to party for long hours.

Elementary school pupils would be deterred from drinking energy drinks by powerful marketing, health problems among their family members and friends, and news about deaths due to energy drinks. Secondary school pupils were of similar opinions and added that they would be deterred by scientific studies and video clips showing the actual ingredients of energy drinks.

Interview analysis has shown that knowledge of energy drink ingredients and their effects on health increases with age. Elementary school pupils only stated simple ingredients, while secondary school pupils already knew more unfamiliar ones. In naming illnesses that could be caused by energy drinks, elementary school pupils listed a few, while general upper secondary school pupils noted more, but it is the pupils of secondary medical school who named the most. The results reflect the elementary school curriculum. In subjects such as Biology and Home Economics not many lessons are dedicated to healthy eating habits. However, science subjects of secondary school curricula include dietary habits. The topic is most comprehensively discussed in vocational nursing education.

Several limitations of the present study must be acknowledged. In order to generalize the findings at the national level, it would be necessary to involve more teens coming from various schools and social environments.

On the basis of these findings, we will make an online survey questionnaire for Slovenian teenagers that will include more participants. All primary schools and all secondary schools with the following educational programmes will be invited: general upper secondary programmes, gastronomy-tourism technician, food and nutrition technician, and nursing education/technician. The participants will have to answer some questions about their personal data and about their families' socio-economic and demographic characteristics. Moreover, they will have to state how well they know energy drink brands and their ingredients, how often they consume them, what encourages/discourages them to purchase and consume energy drinks and what they know about the influence of energy drink consumption on their health. Based on the answers of focus group participants, various questions that will cover the above-mentioned topics will be formed: open-ended questions, close-ended questions, and combined question types.

5 CONCLUSION

The results will serve as the basis for further research on the habits of teens who consume energy drinks in Slovenia. However, their teachers' opinions would make a valuable contribution to the research. Slovenian elementary and secondary school curricula will be additionally analysed in order to see how often the topics related to energy drinks are taught in compulsory and optional classes. After that, didactic materials to teach these topics in everyday school classes will be formulated. We would suggest that the National Education Institute include the topic of energy drink consumption in the elementary and secondary school curricula. Moreover, it is of great importance to educate teachers, parents, and the general public as well.

CONFLICT OF INTEREST

The authors declare that no conflict of interest exist.

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ETHICAL APPROVAL

Study was approved by the Republic of Slovenia National Medical Ethics Committee (document No. 0120- 296/2015-2).

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