

WHAT DO CZECH NINTH-GRADERS DRINK TO STAY HYDRATED?

Jana KOČÍ

Abstrakt

Some people believe we were born into the unhealthiest time over the human evolution. Some people believe we build nutrition lifestyle that slowly but surely kills the humanity. But here is one fact to keep on our minds: nutrition is not just about food. Hydration plays a big role in our nutrient and calorie intake and a massive role on a quality of our health. The average adult human body is 50 – 65% water, averaging around 58 – 60%. The percentage of water in infants is much higher, typically around 76 – 78% water, dropping to 65% by each year of age. Hydration is particularly important for adolescents as they have higher water requirements in relation to their body weight than adults. Dehydration in children not only causes health disharmony but can also negatively impact one's success at school often attributed to the children disability over the improper hydration. School aged children not drinking enough of water suffer with poor concentration, fatigue and headaches over the school days and can build up to kidney disease in the long term matter. School environment is one of the most influential areas for children to develop healthy behaviors. Nutrition education programing has a great potential to shape school aged children's behavior the desired way. But in matter to know how, we need to get to examine current dietary habits as close as possible. A survey instrument that focuses on nutrition related behavior of school aged children was developed and validated and current nutritional habits of ninth-graders (n= 1 028) across the south bohemia county in Czech Republic were analyzed. The data were transferred into SPSS analytical program and were analyzed using descriptive and inferential statistics and focused on habits related to hydration of school aged children. According the research 65% of respondents don't drink as much beverages as the Nutritional recommendations for the Czech Republic regarding children and adolescents. It was found that one fifth of examined students never drink water and there is at least one student at an average school class consuming alcohol and energy drinks every day.

Keywords

Drinking regimen, preferred beverages, consumption frequency, elementary school, school aged children, nutritional habits, health promotion.

INTRODUCTION

We all know it's important to fill school kids' plates with healthy food. But what is poured into their glasses matters, too.

Children and adolescents are a special audience that needs particular attention. The current industry's role is enabling young consumers to make healthy choices that takes a part on building of their everyday lifestyle

transmitting to adulthood. Each adult American consumes on average more than 200 calories every day from sugary drinks (Bleich, Wang, Wang, & Gortmaker, 2009) – four times what they consumed in 1965 (Duffey, & Popkin, 2002). According to European Food Safety Authority (EFSA, 2018) research, two-thirds of 10-16-year-olds in European region regularly consume energy drinks, along with 18% of three-to 10-years-olds.

Strong evidence indicates that rising thirst for sugary carbonated drinks not only in adults but mainly in children has been a major contributor to the obesity and diabetes epidemics (WHO Regional Office for Europe; 2013).

The expanded school policy is the latest milestone in the European soft drinks industry's efforts to contribute to prevent obesity. It supports UNESDA's pledge made earlier this year to reduce added sugars in beverages by 10% by 2020, further building on the 12% reduction delivered from 2000 to 2015 (UNESDA, 2017). The ministers of health of the WHO European Member States adopted the Vienna Declaration on Nutrition and Noncommunicable Diseases in the Context of Health 2020 in July 2013 (WHO Regional Office for Europe, 2013). This Declaration acknowledged the high burden of disease caused by unhealthy diets in many countries of the Region and expressed particular concern about the rise of overweight and obesity among children. The World health organization have agreed on certain restriction recommendations on marketing to children so called as the European nutrient profile model (World health organization: Regional Office for Europe, 2015) to prevent child overweight, obesity and chronic diseases. Marketing should not be permitted if product exceeds 2.5g of fat per 100 g in Milks and sweetened milks; almond, soya, rice and oat milks. This nutrient profile model applies to products for children above 36 months. Follow-up formulas and growing-up milks are not covered by this model. It should be noted that World Health Assembly Resolution WHA39.28, adopted in 1986, states that the practice of providing infants with specially formulated. Other restriction recommendations include energy drinks where should not be any permission on marketing at all. No permission for marketing to children has also been advised on 100% fruit and vegetable

juices; juices reconstituted from concentrate, and smoothies. This is in line with the WHO Guidelines on Sugars Intake for Children and Adults (in press), as fruit juices are a significant source of free sugars for children. However, it is recognized that countries, according to national context and national food-based dietary guidelines, may take the decision to permit the marketing of 100% fruit juices in small portions.

"There are really only two things that kids should be drinking: milk and water," says Lisa Asta, MD, a pediatrician in Walnut Creek, CA.

The school environment is one of the main target areas for children to develop healthy behaviors. Various interventions all over the world have been conducted within schools and afterschool programs focused on health promotion, nutrition and proper child hydration. It is more than important to support child's development with such a health behavior programming, but not less important is to keep analyzing current nutrition of school aged children in matter of knowing what nutritional habits need to be improved and what inappropriate habits need to be eliminated.

The aim of this study was to (a) develop and validate a survey instrument that focuses on nutrition related behavior of school aged children; (b) assess current nutritional habits of ninth-graders across the south bohemia district in Czech Republic; and (c) to analyze the nutritional habits related to hydration of school aged children participating on this study (to examine what do school aged children currently drink to stay hydrated and how often do they drink).

The following hypotheses were formulated based on the objectives:

- a) The majority of students (more than 50%) drink water every day;
- b) The majority of students (more than 50%) drink more than one liter

- of fluid every day;
- c) More than one tenth of students (11% or more) drink carbonated soft drinks typically high in added sugars on a daily bases.

METHODOLOGY

The aim of this study was to examine drinking regimen, drink preferences and the consumption frequency of various drink choices to describe what do the ninth – graders of elementary schools in Czech Republic drink to stay hydrated.

PARTICIPANTS

A total of 1 059 students (aged 14 – 15 years) were examined from 25 different elementary schools from South Bohemia county between January 2015 until January 2016. Surveys were administrated in the student's regular classrooms. Students were directed to answer each question to the best of their ability, it took approximately 30 minutes to fill out the Nutritional Habits Survey. Some questionnaires (n= 31) were excluded from the research for variety food restrictions of their authors. The final research group (n= 1 028) consisted of 504 females and 524 males at the end of the compulsory schooling (9th grade).

TOOLS

The Nutritional Habits Survey (Koptíková, 2013) was developed to assess the current nutrition of students at the end of their compulsory schooling (the ninth grade of elementary schools). The instrument uses the construct of behavior with topic areas including meal planning, breakfasts, healthy snacking, lunches, dinners, food and drinks preferences. For the purpose of this study were used and analyzed answers related to drinking regimen and drink preferences. The responses to the items were scored from 0 – 3 points with a higher score reflecting a more positive response. Items were reversely scored when questions were related to an unhealthy behavior.

RESULTS AND DISCUSSION

CHILDREN, HYDRATATION AND BEVERAGE QUALITY

BEVERAGE INTAKE REGIMEN

Exactly one half of the participants (50% of n= 1 028) reported (Table 1) that they drink more than one liter of fluid a day, but no more than two liters a day. A total of 35% said they drink at least two liters a day or more, and 15% of respondents said they did not drink one liter of fluids a day. That shows that only one third (35%) of students drink the proper amount of intake, recommended by Nutrition Society in Czech Republic (2012). How often do students drink is as important as what do students drink. The majority (57%) of respondents stated that they drink very regularly, at least once every two hours or more often; 21% of students drink regularly as well, at least every three hours, and 22% of respondents are not good at regulating their fluid intake - they usually do not drink more often than once every 3 hours.

TASTE PREFERENCES

Good news is that a significant portion of respondents (36%) drink tap water or bottled non-sparkling water daily (6 – 7 times a week), 21% respondents almost every day (3 – 5 times a week), 22% at least weekly (1 – 2 times a week), but 20% of students never drink pure water or very exceptionally. More than one fifth of the respondents (21%) drink milk daily (6-7 times a week), 26% of respondents do drink milk almost every day (3 – 5 times a week), 31% at least once a week (1 – 2 times a week) but again. More than one fifth (21%) of Czech ninth-graders never drink milk or very rarely. One percent of students did not answered the question. We can say tea is quite popular among students, based on the research results. Almost one fifth (18%) of them drink fruit or herbal tea on a daily basis (6 – 7 times a week), more

than one fourth (26%) drink tea 3 – 5 times a week, 34% at least once a week (1 – 2 times a week), and 22% never or only exceptionally. One percent of examined students did not answer the question again. Many of students (13%) drink carbonated water daily (6 – 7 times a week), 22% do drink bottled water with bubbles 3 – 5 times a week, 34% at least once a week (1 – 2 times a week), and 31% never or very rarely. Eleven percent of respondents reported they drink sweet carbonated drinks every day (6 – 7 times a week), 20% most week days (3-5 times a week), 35% at least once a week (1 – 2 times a week), and 34% never or very occasionally in case of soda drinks rich in sugar, also called as “pop” (such as Coca – Cola, Fanta, Sprite, Kofola, tonic water, raspberry lemonade, etc.).

BEVERAGES WITH LOWER CONSUMPTION FREQUENCY

On the opposite side, there are some types of beverages where the consumption frequency is naturally lower among average population. However, neither the consumption frequency of milk with verifiable positive effect on the school aged children’s health nor the consumption frequency of pure water, which is essential for health and wellbeing, cannot be compared with the consumption of alcoholic drinks, energy drinks or drinks high in sugar and oxygen, which have demonstrably unhealthy effect on one’s health, especially in childhood and adolescence.

The majority of students (76%) stated that they never drink alcoholic beverages or very rarely. But 17% of students between 14 – 15 years stated that they drink alcoholic drinks regularly 1 – 2 times a week, three percent drink alcoholic beverages most days a week (3 – 5 times a week), and 3% of researched student group (n = 1 028) drink alcoholic beverages on a daily bases (6 – 7 times a week). One percent of students choose not to answer the question. The situation

with energy drinks is very similar. Four percent of the examined ninth graders drink energy drinks such as Red Bull every day (6 – 7 times a week), 7% students reported they drink various energy drinks during the majority of week days (3 – 5 times a week), 24% do drink energy drinks at least once a week regularly (1 – 2 times a week), and 65% never or exceptionally. Drinking coffee among young population became quite common. Students who reported that they never (or rarely) drink coffee was 58%, 21% of them drink coffee 1 – 2 times a week, 13% 3 – 5 times a week, and 8% daily (6 – 7 times a week); black tea is even more popular among the research group, because even thou 56% never drink it (or exceptionally), significant amount (23%) drink black tea weekly (1 – 2 times a week), 11% the majority of the week days (3 – 5 times a week), and 10% of students drink black tea on a daily basis (6 – 7 times a week). Freshly squeezed juice is also quite popular among students. 55% reported rare consumption (they never drink fresh juices or very exceptionally), but 30% drink fresh juices weekly (1 – 2 times a week), 11% 3 – 5 times a week, and 4% almost every day (6 – 7 times a week).

Consumption of processed fruit juices was among the research group much more common compared to fresh juices consumption. Only 30% of students never (or exceptionally) drink sweetened juices, the majority of students drink processed juices at least once a week (1 – 2 times a week), 23% 3 – 5 times a week, and 6% 6 – 7 times a week.

Table 1: The frequency of variable beverages consumption

Question	How many days a week					
	No answ.	Never or rare	1 - 2x	3 - 5x	6 - 7x	
A	How often do you drink pure tap water or pure bottled water?	0%	20%	22%	21%	36%
B	How often do you drink sparkling water?	0%	13%	22%	34%	31%
C	How often do you drink milk?	1%	21%	31%	26%	21%
D	How often do you drink fruit/herbal tea?	1%	22%	34%	26%	18%
E	How often do you drink freshly squeezed juice.	0%	55%	30%	11%	4%
F	How often do you drink fruit juice?	0%	30%	41%	23%	6%
G	How often do you drink black tea?	0%	56%	23%	11%	10%
H	How often do you drink coffee?	0%	58%	21%	13%	8%
CH	How often do you drink carbonated and sweetened soft drinks?	0%	34%	35%	20%	11%
I	How often do you drink alcoholic drinks?	1%	76%	17%	3%	3%
J	How often do you drink energy drinks?	0%	65%	24%	7%	4%

DISCUSSION

Regular hydration is important especially among school children, whose typical school day is full of diverse activities demanding concentration and mind awareness. An adequate, regular drinking regime and proper beverage intake composition are not only essential to the health and wellbeing of students, but they are also one of the factors contributing to student’s school success and personal well-being.

Inadequate or irregular hydration can result in poor quality of sleep, day fatigue with signs of irritability or decreased level of attention, which may in turn affect short-term memory, thus the ability to store and reproduce learned information. Insufficient hydration can be a counterproductive factor of student’s educational process. While teachers often contribute poor school results with student’s ability or disability to learn (he or she is labeled as an unsuccessful student) in many cases. Long-term insufficient hydration regime and poor beverage content quality may cause several health problems such as headache, troubles to use restroom regularly and kidney disfunction.

However, proper hydration is not only about good regularity and sufficient fluid amount intake. Especially nowadays, when today's society faces a worldwide pandemic of obesity and overweight, the content and quality of consumed beverages is extremely important. School-aged children generally increase their daily caloric intake with excessive amount of refined sugars, they consume excessive amount of caffeine or alcohol, despite the fact that they are still quite far away from being adults.

The aim of the presented research was to examine beverage intake regimen and taste preferences of ninth – graders at the end of their compulsory schooling. School environment is one of the most influential areas for children to develop healthy behaviors. The present study was taken to understand what are the current nutritional habits focused on fluid and beverages like among students in matter to examine nutritional areas that need to be improved to support child health development. It was hypothesized that majority of students (more than 50%) drink water and more than one liter of fluid every day. But it was also hypothesized that at least one tenth of students (11% or

more) drink carbonated soft drinks typically high in added sugars on a daily bases.

Hypotheses (hypotheses (a) and hypothesis (b)) were not supported as less than 50% of respondents (36%, n= 1 028) drink tap water or bottled non-sparkling water daily (6 – 7 times a week), and exactly one half of the participants (50%) drink more than one liter of fluid a day, but no more than two liters a day. The hypothesis (c) was supported as more than one tenth of students (13%) drink carbonated soft drinks typically very high in added sugars on a daily bases (6 – 7 times a week).

It was observed that there is at least one student who drink alcoholic beverages or energy drinks on a daily bases in an average school class. Nearly a quarter of students consume alcohol at least once a week and more than one third of the ninth graders drink energy drinks each week.

On average, there are three students in a class who drink coffee, rich on caffeine every day and a third of the students drink coffee once a week in minimum. There are at least three teenagers in average school class drinking black tea rich on their every day and at least one student in a class who drinks refined fruit juices every day. In addition, students drinking hot drinks such as coffee and tea add in average a teaspoon of sugar into their cup of tea or coffee each time. Three-quarters of students drink processed fruit juices at least once a week. On the other hand, one fifth of the students never drink pure water or milk, and more than one fifth of reported that they never drink neither fruit nor herbal tea.

Considering dietary guidelines for Americans (USDA & USDHHS, 2015), Kid's Healthy Eating Plate (2015) and Dietary guidelines for Czech Republic (2012), there are areas of elementary school students' nutrition and proper hydration needing improvement. School environment has a massive potential to shape students' health related behavior and change their life style the desired

direction. There are a variable choices to influence child's health within the compulsory schooling. Nutrition education programing appear to be an effective nutrition intervention for improving behaviors such as proper fluid intake, and related nutrition knowledge.

Among the major research limitations worth to mention would be the high level of response subjectivity. Even though the questionnaire appears as the most suitable research tool for a study aimed to evaluate one's nutritional life style, it is always needed to consider (a) the strong level of student's self-evaluation. Students' responses are impacted by their own (b) reality perception and influenced with possible (c) sense of responsibility and (d) how ashamed can they feel about improper health behavior while responding the questions. Observation and reality recording appears like the most accurate tool for student's nutrition lifestyle identification, yet hardly feasible considering the sample size (n= 1 028).

CONCLUSION

Results indicate that the Healthy Habits Survey (Koptíková, 2013) is a valid and useful tool to evaluate the current nutrition life style of school among older elementary school students. Only one third (35%) of students drink the proper amount of intake, recommended by Nutrition Society in Czech Republic (2012). Only one third of respondents (36%, n= 1 028) drink tap water or bottled non-sparkling water daily (6 – 7 times a week), and exactly one half of the participants (50%) drink more than one liter of fluid a day, but no more than two liters a day. On the other hand a large portion (11%) drink carbonated soda drinks usually very high on added sugar daily (6 – 7 times a week).

Relatively high proportions of the ninth grade students in this study (n= 1 028) had low intakes (never drink mentioned beverages or very rarely) of water (20%), milk (21%), fruit or herbal tea

(22%), and carbonated water (13%). On the other hand, relatively high proportions of students had high intakes (drink daily) of soft over sweetened drinks (11%), coffee (8%), energy drinks high in sugar and caffeine (4%), and alcoholic drinks (3%). There are nutritional habits among youth calling for strategic interventions to facilitate the behavior change.

The current study did reveal findings regarding to the nutrition lifestyle of youth focused onto beverages intake and fluid intake regimen. It is hoped that it will add to the literature and motivate future researchers and school teachers focus on students' health behavior improvement.

ACKNOWLEDGEMENT

A special thank you belongs to all of the attending elementary school principals, health nutrition educators and students who participated on this research.

REFERENCES

Bleich, SN., Wang, YC., Wang, Y., & Gortmaker, SL. (2009). Increasing consumption of sugar-sweetened beverages among US adults: 1988-1994 to 1999-2004. *Am J Clin Nutr*, 89, 372-81.

Department of Nutrition, Harvard T.H. Chan School of Public Health. (2015). *Kid's Healthy Eating Plate*. Available at: hsph.harvard.edu/nutritionsource/kid-s-healthy-eating-plate.

Dostálová, J., Dlouhý, P., & Tláškal, P. (2012). *Nutrition Society in Czech Republic: The nutrition recommendation*. Accessible from: <http://www.vyzivapol.cz/vyzivova-doporuceni-pro-obyvatelestvo-ceske-republiky/>

Duffey, KJ., & Popkin, BM. (2002). Shifts in patterns and consumption of beverages between 1965 and 2002. *Obesity (Silver Spring)*, 15, 39-47.

European Food Safety Authority. (2018).

The EFSA Comprehensive European Food Consumption Database. Accessible from: <https://www.efsa.europa.eu/en/food-consumption/comprehensive-database>

Koptíková, J. (2013). *The Nutritional Habits Survey for elementary school students*.

UNESDA. (2017). *European Soft Drinks Industry to Stop Sales of Sugary Drinks in Secondary Schools across the European Union*. Accessible from: https://www.unesda.eu/wp-content/uploads/2017/09/UNESDA-SchoolSoftDrinks_PressRelease.pdf

U.S. Department of Health and Human Services and U.S. Department of Agriculture. (2015). *2015 – 2020 Dietary Guidelines for Americans. 8th Edition*. Available at <https://health.gov/dietaryguidelines/2015/guidelines/>.

Vienna Declaration on Nutrition and Noncommunicable Diseases in the Context of Health 2020. Copenhagen: WHO Regional Office for Europe; 2013 (http://www.euro.who.int/__data/assets/pdf_file/0009/193878/ViennaDeclaration.pdf, accessed 21 October 2018).

World health organization - Regional Office for Europe in collaboration with the Department of Nutrition for Health and Development. (2015). WHO Regional Office for Europe nutrient profile model. 5-6. (http://www.euro.who.int/__data/assets/pdf_file/0005/270716/Nutrient-children_web-new.pdf?ua=1, accessed 21 October 2018).

CONTACT

Mgr. Jana Kočí
Faculty of Wellness
The College of Physical Education and Sport PALESTRA
e-mail janakoptikova@gmail.com