

# Nutrition Perspectives

University of California, Davis, Department of Nutrition and the Center for Nutrition in Schools

## High Dose Vitamin C and Zinc Not Found to Reduce COVID-19 Symptom Duration

Zinc and vitamin C are commonly used over-the-counter supplements to prevent or treat viral illnesses, despite mixed evidence as to their efficacy. With the emergence of the coronavirus disease 2019 (COVID-19) pandemic, there has been interest in whether these supplements might be able to reduce duration of symptoms. Researchers at the Cleveland Clinic investigated this question in a randomized clinical trial that took place in Ohio and Florida in 2020.



Patients newly-diagnosed with COVID-19 (n = 219) were randomly assigned to receive one of four treatments: 8,000 mg of vitamin C, taken with meals over the course of the day; 50 mg of zinc gluconate at bedtime; both the vitamin C and zinc therapies; or usual care without either therapy. Patients completed symptom questionnaires when they first enrolled in the study, and then weekly for the next 28 days. Patients scored their symptom severity from 0 (no symptoms) to 3 (severe symptoms),

At the start of the study, four symptoms were included in the questionnaire (fever/chills, shortness of breath, cough, fatigue), but as more was learned about the virus, the symptom survey was expanded include a total of 12 symptoms (the original four plus muscle or body aches, headache, new loss of taste, new loss of smell, congestion or runny nose, nausea, vomiting, and

*Symptom Duration continued on page 2*

## Table of Contents

High Dose Vitamin C and Zinc Not Found to Reduce COVID-19 Symptom Duration	1
Guidelines for Discussing Weight With Children Provide Conflicting Advice on Addressing Weight Versus Health	3
Developing Practical Solutions to Increase Fruit and Vegetable Access Based on Stakeholder Input	4
Warning Labels Reduce Intake of Some Sugar-Sweetened Beverages Among College Students	6
Impact of Foods Away From Home on BMI Differs by Food Security Status	8
Differences in Intake and Biomarkers Between Children Following a Vegan Diet Versus Omnivorous Diet	9

## Symptom Duration (Continued from page 1)

diarrhea).

While the primary outcome of interest was the number of days for symptom severity to drop by half, the researchers also looked at the number of days until no symptoms were experienced and how severe symptoms were at day 5. In addition, they recorded hospitalizations, deaths, whether other medications were prescribed, and if the participants experienced side effects from the vitamin C or zinc treatments. Statistical analyses were conducted periodically throughout the study by an operational safety monitoring board to determine if the research should be concluded early based on whether the treatments were found to have a clear benefit (stopping for superiority) or clearly no benefit (stopping for futility).

On average, participants experienced symptom severity of 4.3 (out of 12 possible) when scoring four symptoms and 11.6 (out of 36) when scoring 12 symptoms. As a result of analyses by the operational safety monitoring

board, the study was stopped early because no benefit was found. There were no significant differences in the number of days to reach 50 percent symptom reduction, number of days to complete reduction of symptoms, or number of hospitalizations or deaths. Those in the treatment groups receiving vitamin C were more likely to experience side effects of nausea, diarrhea, and stomach cramps compared to the other groups.



*While vitamin C and zinc are commonly taken to prevent illnesses such as the common cold, there is mixed evidence as to their efficacy*

Limitations to the study include the lack of a placebo group, and neither researchers or patients were blinded to the treatment each participant received. Furthermore, the study was conducted in a single health system, which may not be generalizable to

those receiving health care from other systems. Overall, this study indicates that there is unlikely to be any benefit to taking high doses of vitamin C and zinc when it comes to reducing COVID-19 symptoms. In the case of vitamin C, high doses may cause additional discomfort to patients already experiencing symptoms of COVID-19.

Reference:

1. Thomas S, Patel D, Bittel B, et al. Effect of High-Dose Zinc and Ascorbic Acid Supplementation vs Usual Care on Symptom Length and Reduction Among Ambulatory Patients With SARS-CoV-2 Infection: The COVID A to Z Randomized Clinical Trial. *JAMA Netw Open*. 2021 Feb 1;4(2):e210369. doi: 10.1001/jamanetworkopen.2021.0369.

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## Guidelines for Discussing Weight With Children Provide Conflicting Advice on Addressing Weight Versus Health

Weight can be a sensitive and difficult topic for caregivers to broach with children. There are concerns that conversations about weight could potentially increase susceptibility to unhealthy body image or disordered eating. Several organizations have created guidelines for parents or healthcare providers on talking about weight with children, but little research is available on how these guidelines compare. In a systematic review of gray literature (literature published outside of traditional academic journals), researchers from Drexel University examined the guidelines for caregivers and health professionals and whether they included actionable advice and supported their guidelines regarding discussions of weight versus overall health with references to scientific literature.

The researchers conducted three searches to identify guidelines for inclusion in the systematic review. First, they searched using Google, as it is the most popular search engine and often where caregivers and health professionals turn first when they are in need of resources. The second search was of websites of government-based healthy agencies and well-known advocacy or professional groups, such as the National Institutes of Diabetes and Digestive and Kidney Diseases and the American Academy of Pediatrics. Lastly, the researchers searched databases of gray literature, as well as clinical trial registries and conference abstracts and proceedings.

Through these searches the researchers

identified 13 guidelines to include in the review. Each underwent content analysis to classify information in the guidelines into themes such as body acceptance, attitude and behavior modeling, conversation advice, among others.

The seven guidelines for caregivers

focused more on body acceptance, conversation tips, and dietary guidelines, while also containing more actionable advice compared to guidelines for health professionals. The six guidelines for health professionals also contained conversation tips, as well as information on weight versus overall health, and modeling

behaviors. In guidelines for health professionals, there was comparatively little in the way of actionable advice and most was not written in a way that could be easily implementable.

When examining whether or not the guidelines discussed weight versus health, and whether these were supported by research studies, the researchers found conflicting advice. While three guidelines stated that conversations about weight loss may increase risk for disordered eating, two stated it would not, and two guidelines suggested talking about both weight and health. Of these, only two supported their recommendations with research. One of these, which suggested avoiding talking about weight, cited four studies, while the other, which stated conversations about weight would not increase risk for disordered eating, cited one study.



*Guidelines in the systematic review conflicted over whether it was harmful to have conversations with a child about their weight..*

## Guidelines (Continued from page 3)

The authors noted that this review was specifically regarding guidelines about speaking to children about weight; in their search they encountered 195 guidelines focused on prevention or treatment, demonstrating the relative lack of guidance on conversations about weight. There were also inconsistencies in recommendations made and few citations to support statements made about discussing weight versus health. The authors recommended that future guidelines should be more transparent about the research basis for their recommendations, as well as include more actionable advice for health professionals.

Reference:

1. Lampe EW, Abber SR, Forman EM, Manasse SM. Guidelines for caregivers and healthcare professionals on speaking to children about overweight and obesity: a systematic review of the gray literature. *Transl Behav Med.* 2020 Oct 12;10(5):1144-1154. doi: 10.1093/tbm/ibaa012. PMID: 33044530.

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## Developing Practical Solutions to Increase Fruit and Vegetable Access Based on Stakeholder Input

Not eating enough fruits and vegetables can increase one's risk of heart disease, diabetes, obesity, various cancers and other chronic diseases. Meeting the recommended 1.5-2 cups of fruit and 2-3 cups of vegetables per day for adults may be more difficult for those with lower incomes. However, research has shown that increasing both the availability and affordability of nutritious options in underserved communities does not necessarily correlate to a positive change in dietary habits. One study conducted by researchers at the University of Buffalo looked at both the nutrition



*The focus groups cited cost of fruits and limited access to fresh produce in their neighborhoods as major barriers.*

habits of community members from low-income households and the availability of various community resources and programs in order to develop practical solutions to increase fruit and vegetable (F&V) consumption lower-income areas.

In this study, which was conducted in urban communities of Western New York, researchers recruited 98 participants for focus groups via the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) program and community partners serving lower-income communities in the area. Researchers asked the focus groups to discuss obstacles to eating enough F&V as well as programs they thought would be helpful in increasing F&V consumption. Focus group members were also asked about the potential effectiveness of programs that were

*Solutions Continued on page 5*

## Solutions (Continued from page 4)

either being proposed or currently enacted with their communities such as farmers markets, community gardens, and a healthy corner store program.

Interviews were also conducted with 17 stakeholders, such as grocery store owners/managers, small farmers and food distributors as well as representatives from organizations that addressed food access issues. During their interviews, the stakeholders were asked about the programs their organizations were implementing or planning to implement in order to increase access to fresh F&V in lower income communities.

Overall, focus group participants cited the cost of F&V, limited availability and accessibility of fresh produce in their neighborhoods, taste preferences and limited eligibility & benefits for programs such as the Supplemental Nutrition Assistance Program (SNAP) and WIC as the main obstacles to F&V consumption. Additional reasons provided by focus group members included a lack of nutrition education for children in schools as well as poor eating habits modeled by children's parents.

On the other hand, the interviewed

Reference:

1. Kasprzak CM, Sauer HA, Schoonover JJ, Lapp MM, Leone LA. Barriers and facilitators to fruit and vegetable consumption among lower-income families: matching preferences with stakeholder resources. *Journal of Hunger & Environmental Nutrition*. 2020 Aug 12:1-9.

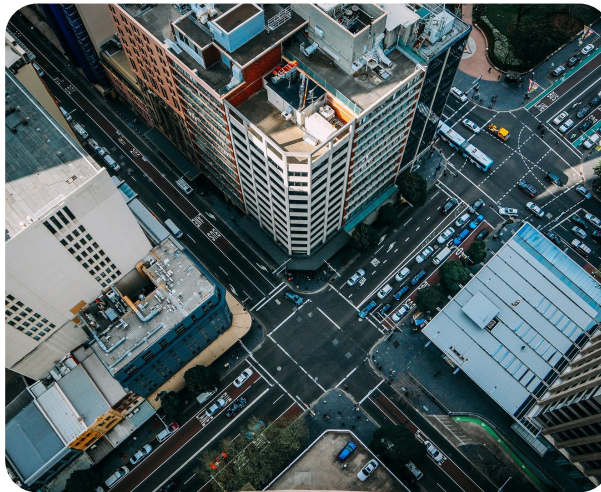
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stakeholders suggested methods to increase F&V consumption such as increasing the affordability of F&V, enhancing nutrition education, and extension of resources to those not eligible but with a demonstrated need for federally funded nutrition benefits and programs.

The researchers agreed that these findings concurred with strategies for increasing F&V consumption identified by other studies. However, this study placed particular emphasis on the lack of nutrition education programs and hours spent in the classroom learning about nutrition leading to low F&V consumption. Corner-store programming and the start of community gardens were met by low-interest in all focus groups.

The study had some limitations,

including a narrow geography where participants were recruited, small sample size, the focus on urban communities and a predominantly female and WIC recipient sample. Researchers called for further investigation into what types of stakeholders are best prepared to implement food access strategies and more locally-based access programs for fruits and vegetables.



*The study was conducted in urban areas of Western New York; as a result the findings may not be applicable to other regions or more rural areas.*

## Warning Labels Reduce Intake of Some Sugar-Sweetened Beverages Among College Students



*In the US, almost half of calories from added sugars are from sugar-sweetened beverages such as soda, sweetened teas and coffees, energy drinks, and sports drinks.*

Americans' added sugar consumption exceeds the daily sugar consumption limit suggested by the World Health Organization of 10 percent of daily calories (1). Almost half of the calories from added sugar come from sugar sweetened beverages (SSBs), which may contribute to weight gain, dental issues and cardiovascular disease. Using warning labels on SSBs has become a strategy to reduce SSB selection and purchase. A study published in the *Journal of Nutrition* focused on the influence of SSB warning labels on college student intake of SSBs and other beverages (2).

In this study, conducted at the University of Michigan, researchers placed warning labels on the SSB drink dispensers in one of the three university dining commons while leaving the other two dining commons' dispensers unaltered so as to serve as comparison sites. Researchers initially recruited 400 students from the site with warning labels and 300 from each site without warning labels. Participants filled out a baseline survey regarding their beverage choices

two months before the warning labels were placed and a follow-up survey two months after the researchers' intervention with the labels concluded.

The label displayed a triangular icon with an exclamation mark on a bright yellow background with a text stating "Warning: Drinking beverages with added sugar(s) contributes to type 2 diabetes, heart disease, and tooth decay". Beverage consumption of both SSBs and non-SSBs was assessed using a modified version of BEVQ-15, a beverage intake questionnaire, which examined an assortment of different drinks available at the university's dining commons. Regular soda, energy or sports drinks, fruit-flavored drinks, sweetened tea and coffee and flavored milk were all counted as SSBs. Diet soda, 100 percent fruit juice, plain milk, artificially sweetened/unsweetened tea and coffee as well as water were considered non-SSBs.

Students reported their responses

*Sugar-Sweetened Beverages Continued on Page 7*



*The World Health Organization recommends limiting added sugars to less than 10 percent of daily calories.*

## Sugar-Sweetened Beverages (Continued from page 6)

according to both the frequency at which they consumed each kind of drink as well as the usual amount consumed for each beverage in fluid ounces. Researchers calculated daily intakes by multiplying the consumed amount by frequency of consumption for both the pre-intervention and post-intervention period. Additionally, demographic characteristics of the students, including age, sex, race, year in school and Pell Grant status, were also surveyed.

Results showed that post-intervention, overall SSB consumption declined by 18.5 percent at the intervention site and 4.7 percent at the comparison sites. From the pre- to post-intervention periods, significant reductions at the intervention site compared to the sites without warning labels were observed in the consumption of sweetened tea, fruit drinks and flavored milk while no significant changes were observed in daily intake of regular soda, energy or sports drinks, or sweetened coffee. When students apart of the intervention site were surveyed for their perception of the SSB warning labels, 45 percent felt "positive", 40 percent felt "neutral" and approximately 14 percent of students felt "negative" about the labels.

Overall, the researchers concluded that SSB warning labels were particularly useful in curbing the consumption of less-obvious SSBs. Limitations to this study included the non-randomized selection of students, brevity of information on students' familial socio-economic status and the focus on students at one university. These raise the question of whether or not this study's findings can be generalized to other university students and young adults. However, researchers noted the use of warning labels is a promising strategy to curb the consumption of SSBs.

### References:

1. Rehm CD, Drewnowski A. Trends in consumption of solid fats, added sugars, sodium, sugar-sweetened beverages, and fruit from fast food restaurants and by fast food restaurant type among US children, 2003–2010. *Nutrients*. 2016 Dec;8(12):804.
2. Leung CW, Wolfson JA, Hsu R, Soster K, Mangan S, Falbe J. Warning Labels Reduce Sugar-Sweetened Beverage Intake among College Students. *The Journal of Nutrition*. 2021 Jan;151(1):179-85.

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*While there was an overall decline in SSB consumption at the intervention site, there was no significant change in consumption of soda, energy or sports drinks, or sweetened coffee drinks.*

## Impact of Foods Away From Home on BMI Differs by Food Security Status



*Eating foods away from home was associated with BMI in those with higher food security, but not in those with very low food security.*

Eating a larger proportion of daily meals prepared outside the home has been linked to a greater risk for overweight and obesity. However, it's not known whether food security may play a role in this greater risk attributed to foods away from home. A recent study conducted by researchers Oregon State University attempted to parse this out.

The researchers used data from over 20,000 individuals collected as part of the National Health and Nutrition Examination Survey (NHANES) to examine the association between foods prepared away from home and body mass index (BMI), and if this differed by whether an individual had high food security, marginal food security, low food security, or very low food security. When analyzing this relationship, the researchers also took into account factors such as age, gender, income, race and

ethnicity, level of educational attainment, household size, and whether or not they were living with a partner, were born in the US, or had participated in federal assistance programs.

Those with high food security both spent more overall and spent a larger percentage of their monthly food budget on foods away from home compared to those with lower food security. Those that participated in food assistance programs also spent less compared to those who did not participate. The researchers found a significant relationship between foods away from home and BMI, with greater frequency associated with higher BMI. However, this wasn't the case for everyone when the data were broken down by food security status. There was no association between BMI and number of times foods away from home were consumed in those with very low food security. In adults with low food security, eating foods away from home 1-2 times per week or 5 or more times per week was associated with higher BMI, but not when they were consumed 3-4 times per week.

Based on these findings, the researchers had several recommendations for nutrition professionals, including emphasizing the importance of at-home food preparation and eating meals as a family, as these are associated with having an overall healthier diet.

*Food Security Continued on page 9*



*While at-home food preparation and eating meals as a family are associated with a healthier diet, this may be challenging for those with less time, skill, cooking equipment, or food access.*



## Food Security (Continued from page 8)

They also acknowledged that food preparation at home may be a challenge for those with less time, skill, cooking equipment, or food access, and nutrition professionals should encourage choosing foods away from home that are healthy and affordable.

When interpreting this study, there are several limitations that should be considered. The first is that food purchases were self-reported, and may be subject to social desirability bias, memory, and varying interpretations of what constitutes a food away from home. The study also did not consider snacking, which can contribute significantly to overall calorie intake.

Reference:

1. Crespo-Bellido MS, Grutzmacher SK, Takata Y, Smit E. The Association Between Food-Away-From-Home Frequency and a Higher BMI Varies by Food Security Status in US Adults. *The Journal of Nutrition*. 2021 Feb;151(2):387-94.

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## Differences in Intake and Biomarkers Between Children Following a Vegan Diet Versus Omnivorous Diet



*Unlike omnivorous diets, a vegan diet contains no animal products, including meat, poultry, fish, dairy, and eggs.*

The vegan diet has been quickly gaining popularity in recent years, with an increasing number of children being born into vegan families. Despite the rise in veganism, not much is known about the effect of the vegan diet on young children's bodies. In adult bodies, it has been shown that the vegan diet can lower cholesterol and body mass index (BMI) as well as lowering the risk for heart disease and certain types of cancers (1,2). However, as children need proportionally more nutrients and energy compared to adults, there is concern that a poorly planned vegan diet may increase risk of nutrient deficiencies in children. A study published in the journal *EMBO Molecular Medicine* focuses on the nutritional and metabolic states of children following a vegan versus an omnivore diet (3).

In this study, conducted at a Finnish daycare, researchers observed forty children under the age of four that had followed either an omnivore, vegetarian or a vegan diet since birth and had no underlying health problems. This included 24 omnivorous children, ten vegetarians and

*Vegan Continued on page 10*

## Vegan (Continued from page 9)



*The children following a vegan diet had lower intake of saturated fatty acids and cholesterol and a higher intake of unsaturated fats, linoleic acids, fiber, and folate compared to children following an omnivorous diet.*

amino acid, and Vitamins A and D levels to be lower in vegan children. No significant difference was shown in Vitamin B12, zinc, iron and iodine levels when comparing vegan to vegetarian and omnivore participants. Additionally, results showed no differences in both the heights and BMI of participants across the different diet groups.

Overall, through conducting biomarker analyses of the children's blood and urine samples, the researchers determined that the metabolism of children on a vegan diet is significantly different than those consuming an omnivorous diet. However, with the study only including six children following a vegan diet, these results may not be generalizable to other vegan children. The small sample size and focus on children at a high-income country daycare both call into question whether this study's results could apply to children following a vegan diet in other settings. Researchers called for more studies that include children following a vegan diet as well as the consequences of lower vitamin D, essential amino acid, and cholesterol levels in vegan children.

### References:

1. Appleby PN, Key TJ. The long-term health of vegetarians and vegans. *Proceedings of the Nutrition Society*. 2016 Aug;75(3):287-93.
2. Tong TY, Appleby PN, Bradbury KE, Perez-Cornago A, Travis RC, Clarke R, Key TJ. Risks of ischaemic heart disease and stroke in meat eaters, fish eaters, and vegetarians over 18 years of follow-up: results from the prospective EPIC-Oxford study. *bmj*. 2019 Sep 4;366.
3. Hovinen T, Korkalo L, Freese R, Skaffari E, Isohanni P, Niemi M, Nevalainen J, Gylling H, Zamboni N, Erkkola M, Suomalainen A. Vegan diet in young children remodels metabolism and challenges the statuses of essential nutrients. *EMBO molecular medicine*. 2021 Feb 5;13(2):e13492.

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