

## Dietary habits of consuming plant foods before and during the COVID-19 pandemic

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The COVID-19 pandemic may affect eating behavior and dietary habits alongside preference and personal attitudes toward plant food Ruiz-Roso et al., 2020, Sidor and Rzymski, 2020). WHO Nutrition advice for adults during the COVID-19 outbreak recommends eating fresh and unprocessed foods, moderate amounts of fat and oil, less salt and sugar, and drinking enough water every day (WHO, 2021) since proper diet can help to ensure that the body is in the strongest possible state to battle the virus (Aman and Masood, 2020).

In order to assess the prevalence of consuming plant foods before and during the COVID-19 pandemic in Serbia alongside dietary trends, an anonymous survey was made on the basis of our previous questionnaire on Attitude and prevalence of bee products use in pediatric pulmonology patients (Zivanovic et al., 2019). The study was approved by the Ethical Committee of the Faculty of Medicine, University of Nis, Serbia. A cross-sectional study was performed using an anonymous online questionnaire that contained 16 open-ended and closed-ended questions. The questionnaire was divided into modules by subject: demographic data, the general attitude towards fruits, vegetables, and herbal teas, the type of plant food, and frequency of its usage before/during the COVID-19 pandemic. The invitation to participate in the survey was made by Viber, Facebook, Instagram, or by e-mail. Data collection was carried out through a structured questionnaire created in Microsoft Forms (Microsoft 365) while they were statistically analyzed by MATLAB R2017 software.

Out of a total of 408 examinees, 82 (20.1 %) were males, while 326 (79.9 %) were females, with an average age of  $27.5 \pm 6.6$  years. The most oft hem are employed (261), followed by students (64), unemployed (62) and retired citizens (21). Out of 408 interviewed people, 278 reported college or postgraduate training as the highest level of their education and only 2 basic levels of education.

Almost all interviewed people agreed that fruits and vegetables contribute to strengthening immunity. Only 3 % of examinees do not believe in the health benefits of everyday fruits and vegetable consumption. Yet, 26.2 % absolutely and 29.9 % strongly consider their diet balanced with a sufficient intake of fruits and vegetables, while 10% admitted poor dietary habits.

When it comes to the quality of plant food, more than 69 % of respondents connect the excellent appearance of fruits and vegetables (seemingly the most beautiful herbal food) with overtreatment with different chemicals, and more than half of examinees prefer moderate price and appearance of herbal food. Fruits and vegetables are usually bought at the marketplace, followed by hypermarkets and groceries, 129, 116, and 115 responses, respectively. Compared to last year, the majority of

respondents reported the same amount of frozen and processed fruits and vegetables left for winter; significantly greater or greater amounts were declared by 11%, somewhat smaller by 9.8 %, much smaller by 4.9 %, and around 1 % did not prepare at all this type of „winter food”.

An increase in fruit and vegetable consumption was seen in 66 % and 35 %, respectively, with an overall higher tendency to drink dietary supplements from the beginning of the pandemic (Fig. 1). OTC market in Serbia increased by 15 % vs. the prior year, and the highest contributor in it was made by the vitamins, minerals, and supplements (Chamber of Commerce Serbia, 2021). Around half of respondents use supplements without the recommendation of an expert, and 43 % believe that vitamins, minerals, and supplements are necessary for maintaining good health in the time in which we live.

Around 87 % of respondents agreed that herbal medicines and natural products (teas, balms, bee products, etc.) have a beneficial effect on health, despite only 4 % of examinees started to drink herbal teas regularly or often with the pandemic. The most frequently applied tea was the herbal tea, and it could be noticed that ones that used to drink herbal tea from time to time moved toward the regular consumers with the COVID-19 pandemic (Fig. 2). The most frequently mentioned newly included fruits and vegetables in examinees' diet since the beginning of the pandemic were: ginger, beets, garlic, horseradish, pomelo, and avocados, while celery, thyme, buckthorn, parsley, nettle, and wild oregano were reported as recently introduced medicinal plants.

The conclusions of some recent studies [1,2] pointed out diet impairment due to the COVID-19 pandemic while some others reported its improvement [7]. Although there were no statistically significant differences between fruits, vegetables, and herbal teas consumption before and during the COVID-19 pandemic, a great number of respondents in our study noted a shift toward healthier diets. Indeed, around half of the examinees pointed out that their diet slightly moved toward a "healthy" diet since the beginning of the pandemic (among them near 14% significantly approved their dietary practice) while 14,95 % of all respondent now have the same habits as before pandemic although they improved their diets at the beginning of COVID-19 issue.

Our survey has shown that pandemic did not much affect dietary habits except greater vitamins, minerals, and supplements usage and moderate shift toward larger consumption of plant foods.

**Keywords:** fruits, vegetables, herbal tea, dietary supplements, online questionnaire.

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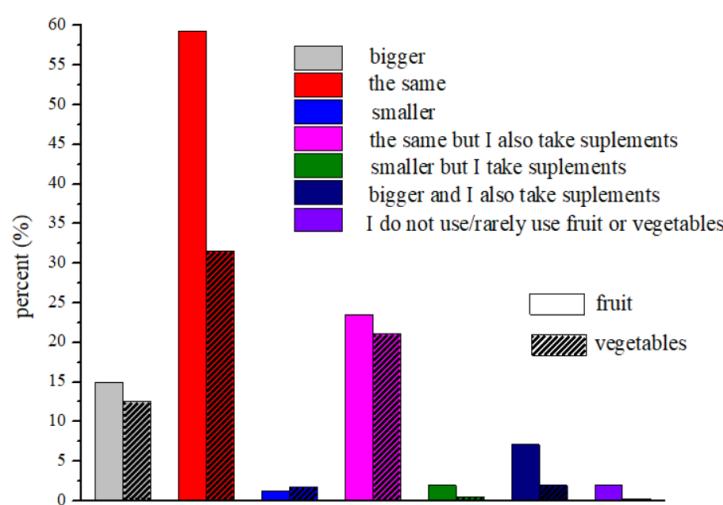


Figure 1. The amount of fruit/vegetable respondents declared to eat now in comparison to the amount before the COVID-19 pandemic.

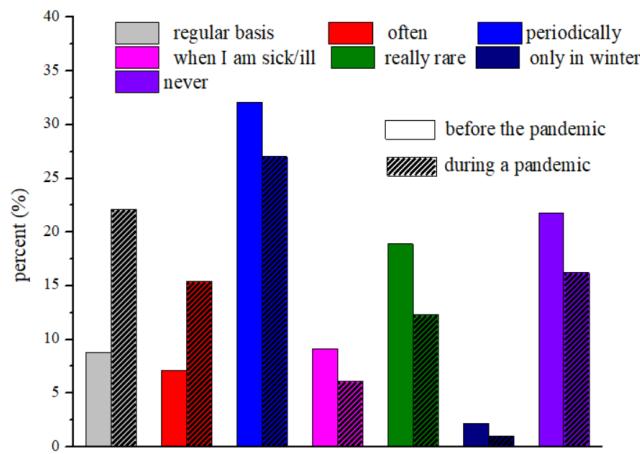


Figure 2. The frequency of herbal tea consumption respondents declared to take now in comparison to the amount before the COVID-19 pandemic.

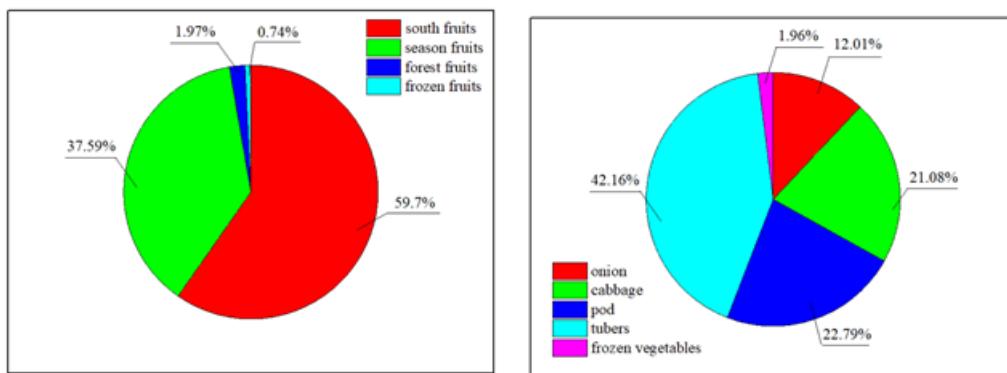


Figure 3. Type of fruits (right) and vegetables (left) that were reported as the most frequently consumed.

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