

# Assessment of dietary supplement consumption in Republic of North Macedonia during the COVID 19 pandemic

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## Introduction

The COVID-19 pandemic has caused an unprecedented health crisis worldwide, challenging the capacity of the healthcare systems as well as the societies in general. Fast and easy spread of the disease and the lack of proven pharmacological therapy has forced individual's tendency towards foods and nutrients may possess protective or therapeutic effects. In the wake of COVID-19, dietary supplements have gained a critical role in nutrition, which has crucial influence on the prevention and treatment of the disease. Scientific evidence on immune-boosting, anti-inflammatory, antioxidant, and antiviral properties, is well known only for vitamins and minerals. The supplementation with vitamins D and C, zinc, and selenium in patients with deficiencies of those nutrients was shown beneficial (Hamulka et al., 2020), but there are no convincing studies that support the intake of dietary supplements in COVID-19 prevention and treatment in healthy and well-nourished individuals. In addition, the guidelines for the treatment of COVID-19 do not provide apparent support on the use of dietary supplements (Adams et al., 2020). However, the sales of dietary supplements have dynamic increase all over the world. In the United States dramatically elevated sales were registered up to 415% since the beginning of March 2020 (Grebow, 2020). Sales of multivitamins and vitamin C supplements in the UK have significantly increased by 93% and 110%, respectively (Louca et al., 2021). In Poland, the highest consumption of vitamin and mineral supplements was registered with vitamin D and zinc as the most often used,

particularly among people medically educated (Puścion-Jakubik et al., 2021). As a result of this global trend, we aimed to analyze the dietary supplement intake changes in the Republic of North Macedonia during the COVID-19 pandemic.

## Materials and methods

An online questionnaire composed of 12 structured questions to gather objective information about people's knowledge, belief, attitude, and behavior associated with the use of dietary supplements during the COVID-19 pandemic was created. The survey included 426 participants, each allowed to complete the questionnaire only once. For the assessment of specific features related to the consumption of dietary supplements Republic of North Macedonia, a descriptive approach was applied. Herein, the respondents were required to answer voluntary and anonymous following questions: frequency of dietary supplement use during the pandemic, continuous or intermittent consumption, preventive or therapeutic usage, where the dietary supplements were supplied from, category of the supplement due to the composition, belief in their quality and safety and sufficiency of data provided to people, getting professional advice before consumption, notification of side effects during the use or afterwards.

## Results and discussion

A very high percentage of respondents (88.5%) declared consumption of dietary supplements that was not surprisingly toward global trend of their enormous intake during the coronavirus pandemic. Approximately half of these respondents (41%) used to take dietary supplements earlier in life. Of them, 30% used dietary supplements sparingly, while 18% used them only when indicated. People who had not taken dietary supplements prior the pandemic (11.5%), neither did after its onset. Large number of respondents (almost 60%) consulted qualified personnel before supplement administration, while the rest 40% did not use supplements on their own. About 54% of respondents started to use supplements upon occupational recommendation. Others have been governed by the information electronically available, through advertising or other public sources ( $\approx 31\%$ ) or advised by friends (20%). The authority of pharmacist's recommendation was declared by significant number of people (54%), 33% requested a professional opinion from a healthcare practitioner, while the rest answered that had been assisted by dietitians or nutritionists. Even 87% of respondents supplied the supplements in community pharmacies, 17% in healthy food stores, and only 5% used internet sales. This seems to be an indicator of people's awareness to look for proper information regarding beneficial effects of the supplement or its interactions with medications. Relatively small number of respondents (about 8%) has experienced adverse health events related to the supplementation. Considerable part of respondents (82.6%) was convinced in the availability of effective and safe dietary supplements, but even more people think that only tenuous data are provided to consumers. Continuous supplementation during the pandemic was reported by 40% of respondents, while 30% of people declared several months' consecutive use and 26% of people used supplements only temporary. 5.3% were supplemented only once during the pandemic. A great number of participants used supplements (87.4%) to prevent the coronavirus disease, while supplementation was included in the therapy of 16.8% of respondents. Leading products used were vitamin C and vitamin D (87% of respondents). Supplements containing vitamin A and vitamin E were used by 14.8 and 13.1% of respondents, respectively. Regarding the minerals, the highest consumption was reported for supplements containing zinc (70% of respondents) followed by magnesium (49.2%). Selenium-based supplements were used by 37% of respondents. Probiotic supplements were also often used by people during the pandemic (31% of respondents). This survey revealed that vitamin or mineral dietary supplements were the most frequently chosen category. Immunity affecting supplements not containing

vitamins or minerals have not been the primary choice of consumers in other countries too (Puścion-Jakubik et al., 2021). The driving effect of COVID-19 on dietary supplement-related behavior is probably due to experience with other viral infections or a quest for an effective prevention/treatment alternative. According to Hamulka et al. (2020) people tended to start supplementation during the first COVID-19 wave rather than the second one. Such a behavior has not been assessed in our survey, but it may be important in gaining more understanding whether supplementation can help. This can be implemented in education for rationale use of dietary supplements, especially when there is a risk for increased intake of some nutrients or the use of supplements is accompanied by harmful effects.

## Conclusion

The popularity of dietary supplements during the COVID-19 pandemic was more than a twofold increased. It was a prospective observation, but questionable is its rationale. High percentage of supplements supplied from pharmacies and substantial number of people seeking professional opinion indicated the increased awareness of consumers whether and when supplementation is appropriate. Undoubtedly, while evidence to support supplements use is lacking, health-protecting behavior against COVID-19 should be based on balanced nutrition and healthy lifestyle.

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