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Editorial

Dietary Supplements: Boon or Bane?

Sarvin Sanaie[1*]

[1]Research Center for Integrative Medicine in Aging, Aging Research Institute, Tabriz University of Medical Sciences, Tabriz, Iran

***Corresponding Author:** Sarvin Sanaie, Email: sarvin_so2000@yahoo.com

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Introduction

Supplemental vitamins and minerals are commonly consumed by individuals seeking to enhance their overall health and well-being. While these products are often marketed as beneficial and necessary for optimal health, it is crucial to recognize that they can also pose potential harms. This study aimed to shed light on the dark side of supplemental vitamins and minerals, highlighting the risks associated with their excessive or inappropriate use. Dietary supplements are products that are intended to supplement the diet and provide additional nutrients to the body. They do not intend to replace a healthy diet but rather to complement it and include vitamins, minerals, herbs or other botanicals such as echinacea and garlic, amino acids, enzymes, live microbes such as probiotics, and other products such as glucosamine and fish oils.[1] These supplements can be found in a variety of forms, including pills, capsules, powders, and liquids. Supplements have become increasingly popular in recent years, with many people turning to them as a way to improve their health and well-being and to boost their immune system. They are often marketed as a way to improve athletic performance, promote weight loss, prevent or even treat chronic diseases, and enhance overall health.[2]

Sudden Change in the Use of Dietary Supplements During COVID-19

Almost 50%–75% of the population routinely use dietary supplements, and there has been a modest global increase in the use of dietary supplements over the last decades. However, this increase has indicated a rapid growth during the COVID-19 pandemic in most countries due to their perceived immune-boosting effects.[3,4] Reports of dietary supplement use before and during the COVID-19 pandemic were 29.5% vs. 71.9% in Asia, 40.6% vs. 75.7% in America, 30.8% vs. 68.7% in Europe, and 21.3% vs. 62.2% in Turkey, respectively. The most commonly used dietary supplement is vitamin C (74.7%) followed by vitamin D (58.2%) and multivitamins (34.2%) in all regions.[5] A survey assessing the use of complementary and alternative medicine (CAM) during the COVID-19 outbreak in the general population of Iran reported that 84% out of the 782 participants used at least one type of CAM during the COVID-19 outbreak, of which dietary supplements (61.3%) were used with the highest frequency.[6] An internet-based study assessing 1488 adult participants from the general population showed that 48.9% of participants used dietary supplements before COVID-19, and it increased to 57.9% during COVID-19.[4] In another study conducted in UAE on 2060 participants, 56.6% reported the supplements use during COVID-19 to prevent or treat it. This rate of use was mainly due to the influence of social media (40.4%), and healthcare practitioners had a marginal role in this regard (20%).[7]

Unveiling the Potential Harms

While there are certainly benefits associated with the use of dietary supplements, and these products are often marketed as beneficial and necessary for optimal health, it is crucial to recognize that they can also pose potential harms. This study aimed to shed light on the dark side of supplemental vitamins and minerals, highlighting the risks associated with their excessive or inappropriate use. One significant concern surrounding supplemental vitamins and minerals is the lack of stringent regulation in the industry. Unlike pharmaceutical drugs, dietary supplements do not require pre-market approval from the FDA in the United States. This absence of regulation means that the safety, efficacy, and quality of these products can vary significantly, leading to potential harm to consumers.[8]

A notable drawback associated with nutritional supplements is the risk of overdose. While vitamins and minerals are essential for our body's proper functioning, excessive intake can lead to toxicity. Some supplements, such as vitamin A and iron can be toxic in high doses. It is important to follow recommended dosages and

not exceed them. Moreover, fat-soluble vitamins can accumulate in the body, causing adverse effects such as nausea, vomiting, organ damage, and even death in extreme cases.[9] Similarly, excessive intake of minerals such as iron, zinc, and selenium can also lead to toxicity symptoms such as gastrointestinal distress, liver damage, or impaired immune function.[10] The other problem that should be noted is their interactions with medications. The use of dietary supplements alongside prescription medications has become increasingly common, and it is crucial to recognize that these seemingly innocuous supplements can interact with prescription medications, potentially compromising their efficacy or leading to potential risks and harmful side effects. This scientific article aimed to explore the complex interplay between supplements and prescription medications, shedding light on the mechanisms of interaction and the importance of healthcare professional guidance. In this regard, pharmacokinetic and pharmacodynamic interactions have been described. Supplements can influence the absorption, distribution, metabolism, and excretion of prescription medications, altering their pharmacokinetic properties. For example, St. John's Wort, a popular herbal supplement, can induce cytochrome P450 enzymes, affecting the metabolism of various drugs, including antidepressants and oral contraceptives.[11] Moreover, the cytochrome P–450 3A4 system that is responsible for the first-pass metabolism of many drugs is inhibited by grapefruit. On the other hand, the P-glycoprotein pump in the brush border of the intestinal wall transports many of these cytochrome P–450 3A4 substrates, and it is inhibited by grapefruit juice. Hence, grapefruit juice can alter the pharmacokinetics of a variety of medications by inhibiting these enzyme systems, leading to the elevation of the serum concentrations of these drugs. Calcium channel antagonists and statins are of the most notable groups of them.[12] Supplements can also exert pharmacodynamic interactions by affecting the same physiological pathways or targets as prescription medications. For instance, both omega-3 fatty acids and anticoagulant medications such as warfarin have antithrombotic effects. Combining these two agents may increase the risk of bleeding.[13] Combining herbal supplements such as Ginkgo biloba or garlic with anticoagulants may enhance their effect, leading to excessive bleeding.[14] Moreover, vitamin K supplements can reduce the effectiveness of anticoagulants (e.g., warfarin), while high doses of vitamin E might increase the risk of bleeding when taken with antiplatelet drugs.[15] It is essential to consider these interactions to prevent adverse events and ensure optimal therapeutic outcomes. In this regard, educating patients about the potential interactions between supplements and prescription medications is crucial. Patients should be empowered with knowledge about the potential risks associated with combining supplements and prescription medications, emphasizing the need for open communication with their healthcare providers. Healthcare professionals play a vital role in assessing potential interactions, adjusting medication regimens, and providing evidence-based recommendations regarding supplement use.

Finally, it can be said that while supplements can play a role in supporting specific health conditions or addressing nutrient deficiencies, there are also potential harms that should be considered, and it is crucial to approach their consumption with caution. The potential harms associated with excessive intake, interactions with medications, and the lack of regulation should not be overlooked. It is important to speak with a healthcare provider before starting any new supplement regimen and to follow recommended dosages. Additionally, it is important to choose supplements from reputable manufacturers and to read labels carefully to ensure getting the right dosage and ingredients. These findings call for a more integrative approach toward dietary supplements to ensure their proper and safe usage. Therefore, with proper caution and guidance, nutritional supplements can be a useful tool for promoting health and wellness.

Ethics statement

Not applicable.

Conflict of interests declaration

None declared.

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