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NUTRITIONAL HEALTHY FRUIT JUICES FOR COVID-19 AFFECTED PATIENTS: A REVIEW

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ABSTRACT

COVID-19 has emerged as a devastating global health crisis with widespread impacts on human health and the economy. In the absence of a definitive cure, bolstering immunity through nutritional strategies has gained attention. Fruits, rich in essential vitamins, minerals, and phytocompounds, play a vital role in strengthening the immune system. This review highlights the immunological benefits of consuming fruit juices as a complementary approach to support COVID-19 recovery, emphasizing the nutritional and therapeutic potential of various fruit-derived bioactive compounds.

INTRODUCTION

COVID-19, first identified in Wuhan, China in December 2019, has resulted in significant morbidity and mortality worldwide (Lai et al., 2020). Caused by the SARS-CoV-2 virus, the disease manifests as a respiratory illness with symptoms such as fever, cough, fatigue, and in severe cases, acute respiratory distress (Hu et al., 2020). The virus primarily spreads through respiratory droplets and direct contact (Kelvin & Rubino, 2020). Elderly individuals and those with underlying health conditions such as diabetes, cardiovascular diseases, and obesity are at heightened risk of developing severe complications (Yazdanpanah et al., 2020).

In the face of limited therapeutic options, strengthening the immune system through dietary means has gained attention as a preventive and supportive measure. A balanced diet rich in fruits and vegetables can enhance immunity, reduce inflammation, and aid recovery (HealthifyMe, 2021). Fruits are particularly valued for their high content of vitamins (A, C, E), minerals (zinc, potassium), fiber, and antioxidants (Times of India, 2021).

2. HEALTH BENEFIT OF FRUIT JUICES

Proper hydration and nutrition are essential for combating infections and supporting immune health. Fresh fruit juices are an excellent source of natural antioxidants, vitamins, and minerals, and are easily digestible, making them suitable for patients with weakened immunity or digestive issues (Emedihealth, 2020). The bioactive compounds in fruits possess antiviral, anti-inflammatory, and antioxidant properties that can enhance immune response and mitigate COVID-19 symptoms (Ferreyra et al., 2020).

A diet incorporating diverse fruits can help repair tissue damage, reduce oxidative stress, and modulate immune cell activity (Skinner et al., 2011). Consuming fruit juices 2-3 times a day may support faster recovery by improving nutrient bioavailability and reducing systemic inflammation.

2.1 POMEGRANATE AND ITS IMMUNOMODULATORY EFFECTS

Pomegranate juice has been studied for its anti-inflammatory and antioxidant properties. Yousefi et al. (2021) conducted a randomized clinical trial and demonstrated that pomegranate juice consumption significantly reduced inflammatory markers and improved complete blood count in COVID-19 patients [1]. Further, Yousefi et al. (2023) observed improvements in hematologic parameters and inflammation following adjuvant pomegranate juice intake in hospitalized patients [2]. Additional support comes from Saeedinia et al. (2022), who highlighted antiviral and protective roles of fresh pomegranate juice against SARS-CoV-2 [4]. Similarly, Colantuono et al. (2017) and Tito et al. (2021) showed that pomegranate peel extract has potent antioxidant activity and inhibits virus entry via ACE2 receptor interactions [14, 31].

2.2 DIETARY VITAMIN C AND NUTRITIONAL ASSESSMENT IN COVID-19

Haghighian-Roudsari et al. (2023) emphasized post-COVID malnutrition and the challenges of meeting dietary requirements during recovery [3]. Another study by the same team in 2024 linked vitamin C and fruit intake with reduced COVID-19 risk in the Yazd Health Study (TAMYZ) [7]. These findings are consistent with evidence suggesting that vitamin C, prevalent in citrus fruits, plays a central role in immunological defense [8, 21].

2.3 RESVERATROL AND POLYPHENOL-RICH JUICES

Resveratrol, a compound in grapes and berries, has shown antiviral and anti-inflammatory properties. Baur and Sinclair (2006) demonstrated its in vivo therapeutic potential [9], while Zang et al. (2015) observed that it reduced airway inflammation in virus-infected mice [19]. Bohmwald et al. (2019) further noted its ability to mitigate cytokine storms during viral infections [10].

2.4 GRAVIOLA (ANNONA MURICATA) AND PHYTOCHEMICAL SYNERGY

Graviola juice, derived from Annona muricata, has gained attention due to its synergistic flavonoids and acetogenins. Yang et al. (2015) documented its anticancer effects, highlighting its potential as an immune modulator [11]. Reviews by Coria-Téllez et al. (2018) and Hamid et al. (2012) emphasized its antiviral, antioxidant, and cytotoxic activities [16, 32].

2.5 KIWI FRUIT AND DIGESTIVE IMMUNITY

Kiwi fruit is recognized for its vitamin C, polyphenols, and enzymes like actinidin. Chai et al. (2014) and Skinner et al. (2011) found that kiwifruit supports protein digestion, enhances immunity, and exhibits anti-inflammatory properties [17, 28]. Kvesitadze et al. (2001) confirmed its high ascorbic acid content through HPLC quantification [21].

2.6 PAPAYA AND MANGO: TROPICAL IMMUNONUTRIENTS

Papaya contains a broad spectrum of vitamins (A, C, K, B-complex) and enzymes like papain that aid in digestion and immune function. Nouman et al. (2022) presented its utility in platelet recovery and immune health [24], corroborated by online summaries of papaya's health benefits [25]. Mango, rich in carotenoids, flavonoids, and vitamin C, also displays antiviral and antioxidant properties useful in respiratory illness management [16].

2.7 CITRUS FRUITS AND ACE2 RECEPTOR INTERACTIONS

Citrus fruits such as oranges are rich in hesperidin and limonin, which have been shown to inhibit the viral entry mechanism via ACE2 receptor binding [14, 31]. The abundance of polyphenols and vitamin C enhances mucosal immunity and provides a natural defense barrier against respiratory viruses.

2.8 APPLE, DRAGON FRUIT, AND GRAPES IN COVID-19

Apples contain quercetin and polyphenols that regulate lipid metabolism and support gut health. Leontowicz et al. (2001) and Bohn & Bouayed (2020) highlighted their antioxidant and anti-inflammatory effects [27, 34]. Dragon fruit, as discussed by Pal (2021), offers antioxidant benefits and is promising in the management of comorbid conditions related to COVID-19 [30]. Grapes, rich in resveratrol and proanthocyanidins, support cardiovascular and respiratory health and reduce oxidative damage [29].

2.9 DIETARY RECOMMENDATIONS AND POPULATION HEALTH

Askari et al. (2022) found that higher intake of fruits, vegetables, and fiber is associated with lower severity of COVID-19 symptoms [5]. Similarly, Moreb et al. (2021) advocated for fruit and vegetable consumption among high-risk groups to reduce complications and improve immunity [23].

3. TRADITIONAL AND REGIONAL STUDIES ON IMMUNITY

Thapa et al. (2020) reported that public health measures influenced not just COVID-19 outcomes but also trends in respiratory illnesses, indirectly supporting dietary resilience [33]. Shahroodi et al. (2018) reported widespread vitamin D deficiency, pointing to the need for a nutrient-rich diet in immune restoration [35].

Table 1: Fruit juices used as an immunity booster in COVID-19 patients

Fruit	Health Benefits	Key Phytocompounds
Pomegranate	Antiviral activity (inhibits SARS-CoV-2 spike), antioxidant, anti-inflammatory, anti-cancer	Anthocyanins, tannins, gallic acid, ellagic acid, coumaric acid, vitamin C [1–5,14,31]
Grapes	Antioxidant, anti-inflammatory, cardioprotective, antiviral (RSV, HCV), immune support	Resveratrol, flavonoids, proanthocyanidins, polyphenols, potassium [9,10,29]
Orange	Prevents viral entry (ACE2 inhibition), immune modulation, high vitamin C content	Hesperidin, limonin, vitamin C, polyphenols, organic acids [7,14,31]
Kiwi Fruit	Immune booster, antioxidant, enhances protein digestion, anti-inflammatory, cytotoxic to HCC cells	Vitamin C, actinidin, gallic acid, quercetin, hesperidin, cinnamic acid [17,21,28]
Apple	Anti-inflammatory, antioxidant, gut health improvement, heart-protective	Quercetin, catechin, gallic acid, fibers, flavonoids [27,34]
Papaya	Immune boosting, antioxidant, improves platelet count, supports digestion	Vitamins A, C, K, B-complex, papain, polyphenols, flavonoids [24,25]
Pineapple	Anti-inflammatory, antioxidant, treats cough and asthma, weight control	Vitamin C, manganese, B1, B6, polyphenols [30]
Dragon Fruit	Antioxidant, boosts immunity, benefits pulmonary, renal, and cardiovascular systems	Ascorbic acid, betacyanin, vitamin B complex, gallic acid [30]
Mango	Antiviral, immune booster, anticancer, reduces cold symptoms	Vitamin A, C, carotenoids, folate, copper, fiber [16]
Graviola (Soursop)	Cytotoxic, antiviral, inhibits COVID-related inflammatory pathways	Flavonoids, annomutacin, acetogenins (muricin family) [11,16,32]
Mangosteen	Antioxidant, anti-inflammatory, neuroprotective, antibacterial, strengthens immunity	Xanthones, vitamin C, B1, B2, potassium, fiber [26]

CONSLUSION

The most important condition for good health is a complete diet. We need to eat a variety of foods that help us improve our immune system. Antioxidants, vitamins, and minerals are full of fruit. A nutritious diet should include plenty of fruits. A person who consumes a recommended amount of fruits can now face the situation, where complete protection is the only option available until the goal is made. Other foods are mushrooms, dairy products, meat, eggs, and more. This may also help us to improve our immune system. Fruit consumption will not only help fight coronavirus, but will also help fight other potentially fatal diseases. Eat foods that are good for our bodies and maintain good health, especially for hygiene, and never forget to wash your hands regularly for at least 20 seconds, as well as to keep in touch with people.

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