

A google trends analysis: evaluation of the search frequency about alternative treatment methods during the COVID-19 pandemic in Turkey

Abstract

Objective: A rapidly grown up information about COVID-19 has been regularly broadcast on internet websites or social media. In this period, it can be argued that there has been an increase in the online search about the COVID-19 infection, disease prevention or treatment methods. We investigated the Google research trends in searches of alternative treatment methods during the COVID-19 pandemic in Turkey.

Methods: The Google Trends™ (GT™) was used to retrieve data on Internet user search activities and patterns of Google search queries. We searched most known keywords related to alternative and herbal therapies such as thyme, sumac, ginger, tonics, propolis, Vitamin D, Vitamin C and Zinc in GT™ between January 1, 2020 and May 5, 2020 in Turkish.

Results: According to the GT™ analysis of Turkey as of the indicated dates, there have been an intensive search for COVID-19 and treatment methods in March. It was determined that the searches related to the molecules mentioned above peaked at different times and then the search interest decreased. It was also found that the level of social interest decreased with the prolongation of the pandemic period about COVID-19.

Conclusion: The data we obtained as a result of our study demonstrated that there was an increase in the search on medicinal herbs and drugs by the internet users in Turkey during the COVID-19 pandemic.

Keywords: complementary therapies, COVID-19, internet, respiratory failure, multi-organ failure, septic shock

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Introduction

The novel Coronavirus is mainly a pathogen that causes severe infection of the respiratory system. In December 2019, various pneumonia cases of unknown etiology were detected in the Wuhan State of China, and it has spread rapidly all over the world. This virus, which has caused many cases and deaths, was named as COVID-19 by the World Health Organization on February 11th, 2020, and it was declared a pandemic on March 11th, 2020. On May 28th, 2020, a total of 5,596,550 cases and 353,373 (6.3%) deaths were reported worldwide according to WHO reports.¹ In Turkey, the first case was identified on March 11th.

Due to the high spread rate and virulence of the coronavirus worldwide, measures have been taken to slow down the pandemic and reduce the number of deaths. Quarantine practices have been initiated in many countries by inviting people to stay at home, and acknowledgements have been made on collective and personal precautions through the printed and visual media, as well as the social media. Currently, the common symptoms of COVID-19 are complaints of dry cough, elevated fever, weakness, muscle pain, inability to smell, and shortness of breath. In addition, respiratory failure, multi-organ failure, septic shock, and death may occur in more severe cases. Various antiviral treatment methods have been administered for coronavirus infections; however, there is no specific treatment for the disease.² Besides the developing treatment methods for the disease, strengthening the individual immune response of

individuals has also gained importance. Notifications have been made to individuals about certain herbs and vitamins, which are believed to be protective against the disease, particularly through the social media, and the demand for their use is believed to have increased.

In this period when millions of people from all over the world stay at home due to the COVID-19 pandemic, the primary tool for people trying to access health-related data is the online search engines. Therefore, 72% of the users access this information using a search engine, and Google is the most popular search engine with a 75% usage rate.³ Google Trends™ (Google Inc. Mountain View, CA, USA) is a Google product used for demonstrating the frequency of searches on a topic at a specific time and place.⁴ In some epidemiological studies, the effectiveness of Google Trends™ (GT™) as a search engine has been proven for topics such as the identification of rhinitis or influenza outbreaks, as well as the global public interest in osteoarthritis.³⁻⁶ A recent study demonstrated that there was a positive correlation between the frequency of searching for loss of smell and COVID-19 infection.⁷ Another study using GT™ analysis demonstrated increased public interest during the COVID-19 pandemic approximately 11.5 days before the peak of the disease.⁸

In the present study, we aimed to investigate the online Google search frequency, and particularly periodic correlations of sumac, thyme, ginger, propolis, zinc, vitamin D, vitamin C and tonic drinks, which are believed to have immune-enhancing effects and have frequently been shared in both the media and social media groups during this period.

Materials and methods

Google trends

Google Trends (<https://trends.google.com/trends/>) is an online tool, which provides information about the topics that the users are interest in, based on their searches on Google. Google search records cover the period starting from 2004 until 36 hours before the time of search. After the topic and keywords are entered, the region, period and category are selected, and the data is directly obtained from GT™ Explore page in .csv format. There is a scaling between 0 and 100 on the graphs formed related to the search topic. The numbers represent the search interest on the topic according to the given period, and a value of 100 indicates the period when the topic was most popularly searched. A value of 50 indicates that it was half as popular as it reached the highest popularity, while a value of 0 indicates the period when the topic was popular with less than 1% compared to the most popular period.^{9,10}

Search strategy

The majority of the data includes the search made on GT™ between January 1st, 2020 and May 25th, 2020 in order to demonstrate the impact of the COVID-19 pandemic. In order to reveal more significant data on certain variables, a 12-month period was included. In the present study, the search results of the people living only in Turkey were evaluated. We searched for the keywords of thyme, sumac, ginger, Schweppes tonic, propolis, Vitamin D, Vitamin C and Zinc, in Turkish respectively ‘kekik’, ‘sumak’, ‘zencefil’, ‘Schweppes içecek’, ‘propolis’, ‘D vitamini’, ‘C vitamini’ ve ‘Çinko’, which were the food and drug derivatives frequently shared on social media and were argued to be effective in protecting against the coronavirus infection. In addition, we searched for the keywords of “coronavirus” and “koronavirüs” to evaluate of public interest.

Results

It was observed that the search on coronavirus increased in Turkey as of February, and that the search trend started to increase on February 26th, approximately 2 weeks before the identification of

the first case on March 11th, 2020. The search trend reached its peak on March 11th. It was observed the information on COVID-19 tended to decrease despite the periodic increases during the period (Figure 1). The search trends for “thyme” continued to a certain extent as of January (25/100); however, there was an increase as of March 17th, reaching the peak on March 22nd. There was a gradually decreasing trend as of April 1st. While the search for “sumac” continued at a low level (0/100), it reached the highest level on March 26th, and the interest declined within a few days (Figure 2). The interest in “ginger” was also high within the normal time frame (50/100); however, the level of interest started to increase on March 15th and reached the peak on March 19th. It continued in a fluctuating course at average levels by decreasing as of March 29th. The search for “Schweppes tonic” continued at low levels during the normal time frame, while it reached a high level on March 21st. It continued to decrease for a certain time, increased again on April 15th, and continued to decrease again (Figure 3). For “propolis”, which is another nutrient considered to attract growing interest during this period, the search frequency started to increase on the date when the first case was identified in Turkey, reaching the peak on March 17th. The interest decreased gradually over time, and it decreased to low levels as of mid-April. While the search for “Zinc”, which is one of the most frequently discussed substances on social media, continued at certain levels (25/100) as of January, it increased rapidly on March 11th, which was the date the first case was identified. From this date until the middle of April, there was a growing interest. It was notable that the interest peaked especially between March 24th and 27th. As of May, the interest declined to its former levels (Figure 4). During this period, the most popular vitamin derivative drugs were “Vitamin C” and “Vitamin D”. According to our search on these drugs, Vitamin C showed a rapid increase on March 11th. The increase in interest continued in a fluctuating course until mid-April. Afterwards, the interest decreased gradually. Finally, when we examined the last 1-year period regarding “Vitamin D”, it was observed that the interest was high (50/100); however, its interest reached the highest levels between March 15th and 20th. There was a decrease in the interest for a period of time, and it was noticed that the search frequency reached the peak level between May 10th and 16th (Figure 5).

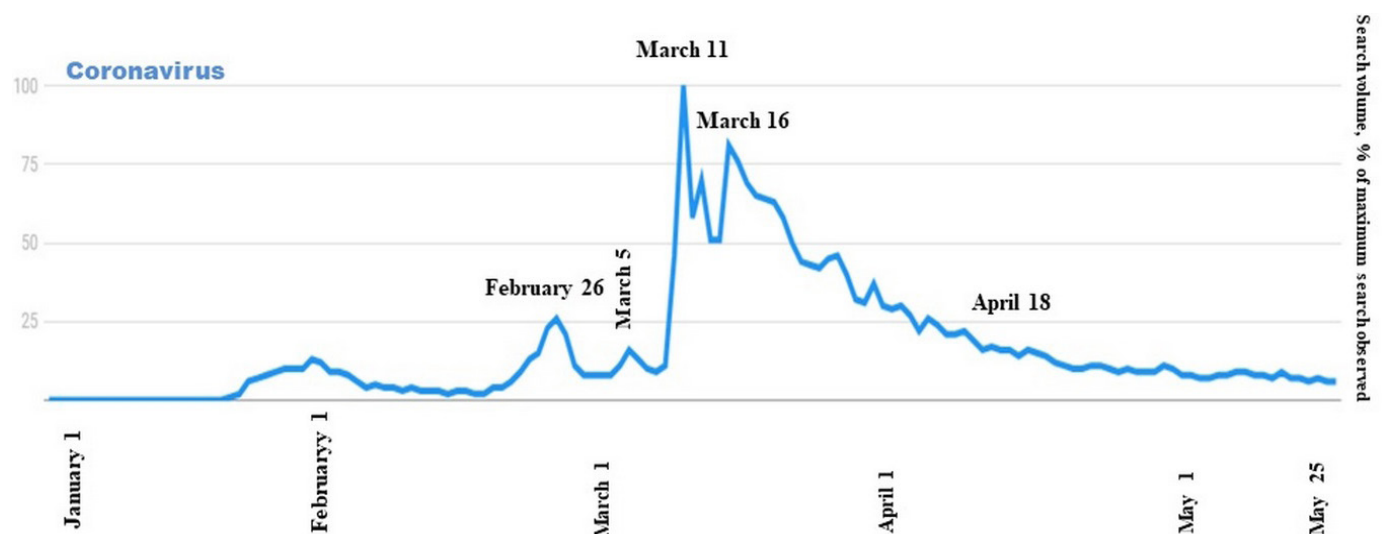


Figure 1 Demonstrates the searching result graphics of Google Trend for ‘coronavirus’.

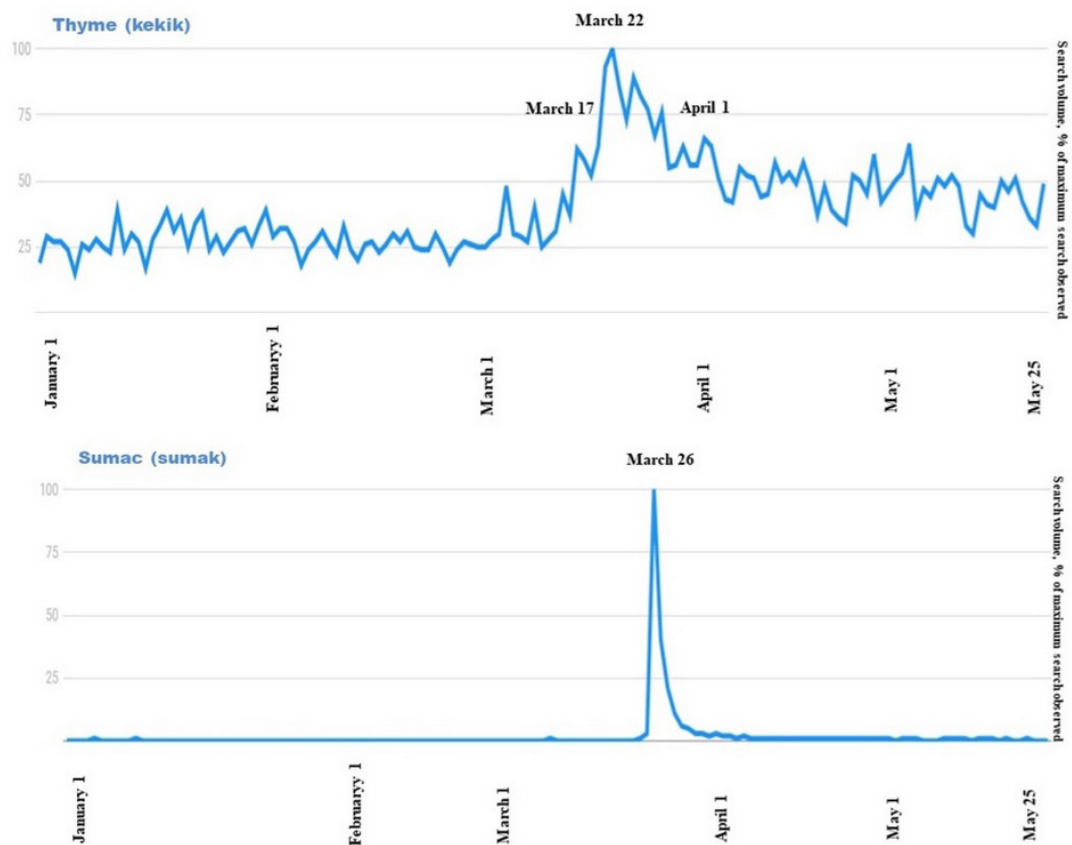


Figure 2 Demonstrates the searching result graphics of Google Trend for 'sumac' and 'thyme'.

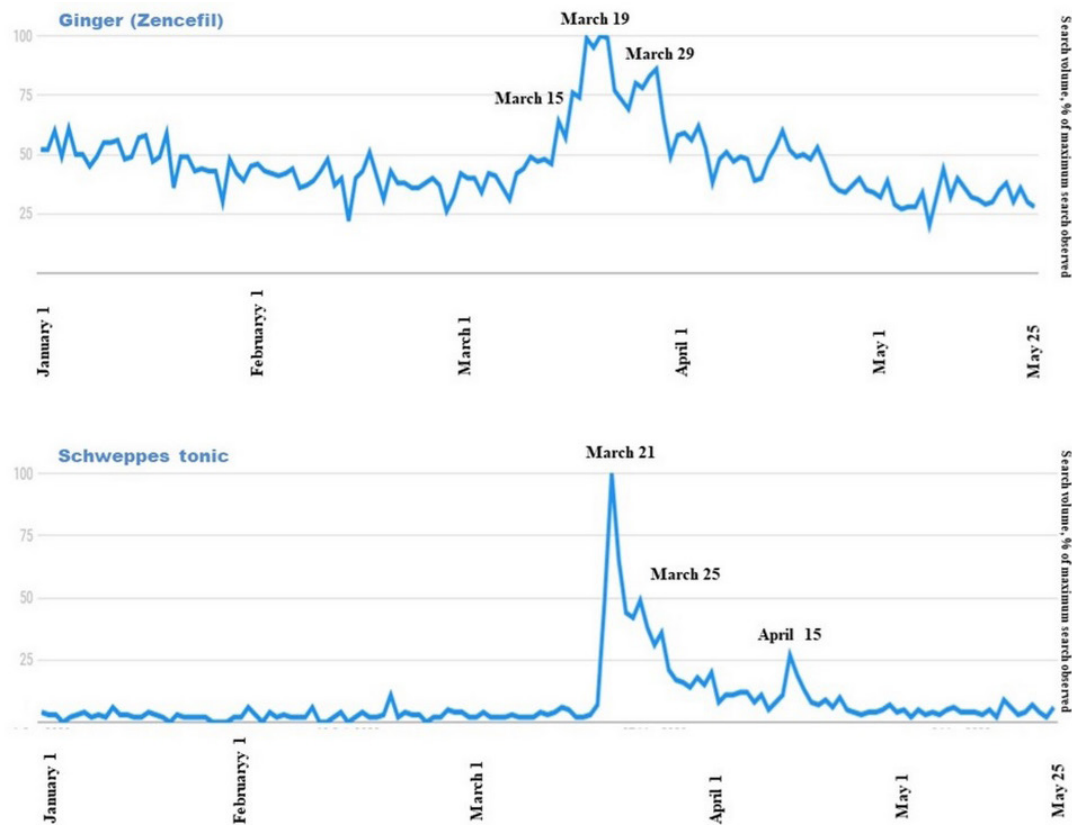


Figure 3 Demonstrates the searching result graphics of Google Trend for 'ginger' and 'schweppes tonic'.

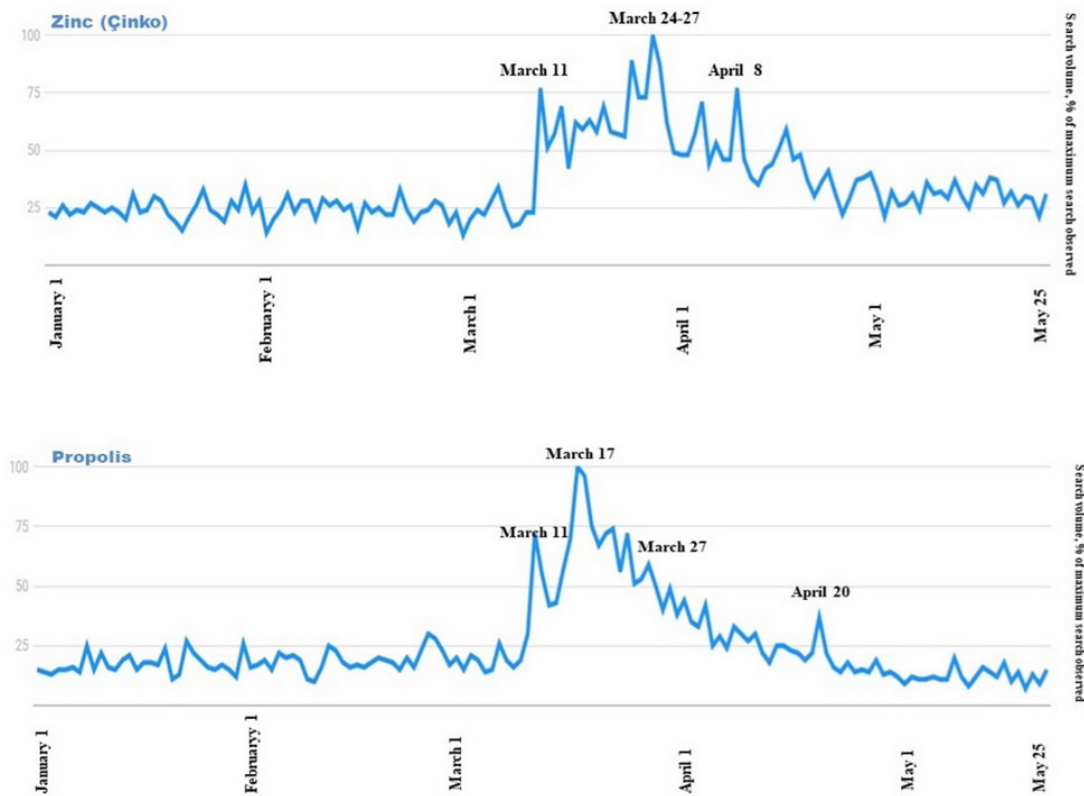


Figure 4 Demonstrates the searching result graphics of Google Trend for 'zinc' and 'propolis'.

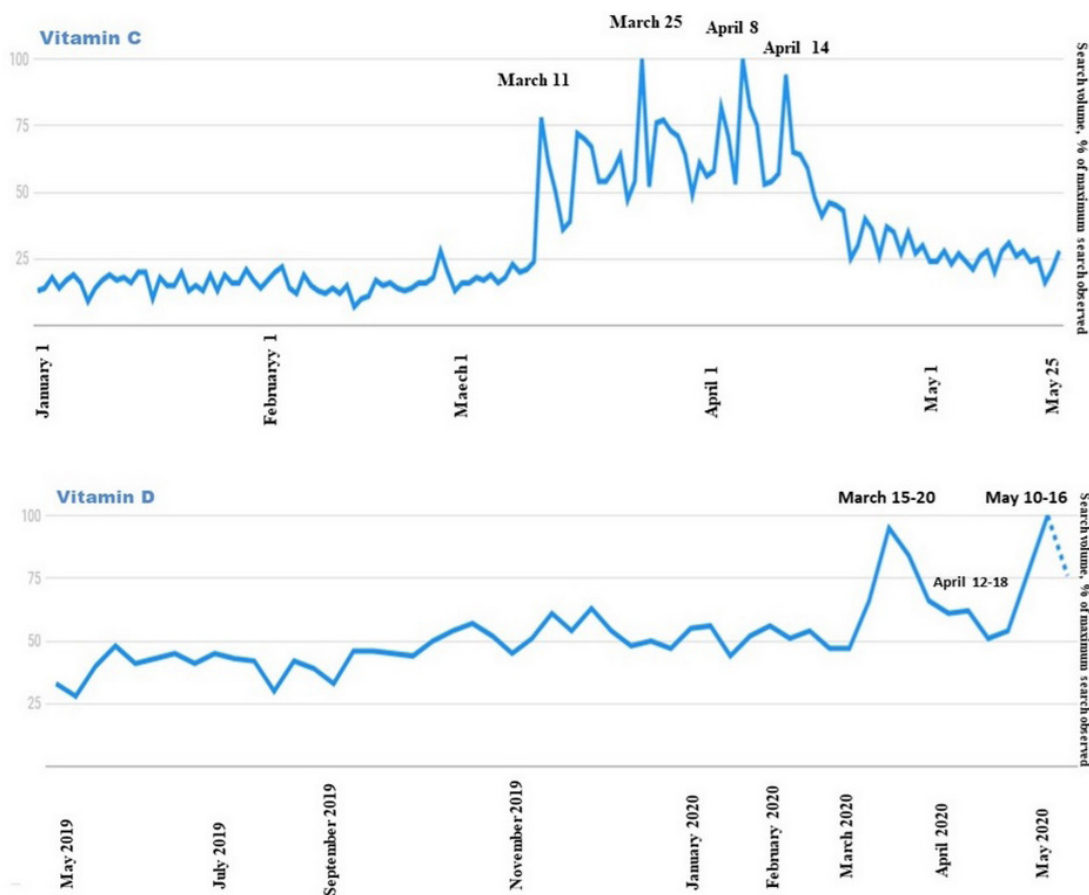


Figure 5 Demonstrates the searching result graphics of Google Trend for 'Vitamin C' and 'Vitamin D'.

Discussion

The data we obtained as a result of our study demonstrated that there was an increase in the search on medicinal herbs and drugs by the internet users in Turkey during the COVID-19 pandemic. It was also found that the level of social interest decreased with the prolongation of the pandemic period.

Basically, herbs have been used for medical treatments in human history, with a continued debate about their effectiveness. Some products and ingredients obtained from the herbs have been proven to have antiviral effects. Various *in vitro* and *in vivo* studies have been conducted on herpes simplex viruses, hepatitis viruses and even HIV virus, and positive results have been reported.¹¹ Carvacrol, a component of thyme, has been proven to have a wide range of effects on fungi, yeast, bacteria, and viruses.¹² It has been proven *in vitro* to have a good antiviral effect on herpes viruses with low toxicity.¹³ In addition, sumac (*Rhus coriaria*) herb has been reported to have a similar antiviral effect, with an antibacterial effect against gram positive and gram negative bacteria, as well as an antifungal effect. It has also been proven to have antioxidant effect, be protective of hepatotoxicity and hematopoiesis, and have anti-fibrinogen effect.¹⁴ When the antibacterial effect of sumac was examined according to the ripening state of the fruits, it was reported that the ripe fruits had stronger antibacterial effect compared to the unripe fruits.¹⁵⁻¹⁷ Therefore, it has been suggested that the use of sumac may be an effective prevention and supportive treatment method for COVID-19.¹⁸ In a study conducted with carvacrol, it was demonstrated that the treatment resulted in reduced alveolar dilatation, macrophage density and IL-1 β , IL-6, IL-8 and IL-17 levels in bronchoalveolar lavage fluid.¹⁹ Based on these antiviral effects of herbal therapies, it is believed that the alternative treatments may be effective for COVID-19 infection, for which a definitive treatment has not yet been found, and which has become a part of our lives for almost a year. Carvacrol, which is a component of thyme called essential oils, has been emphasized for its anti-inflammatory, antioxidant, immunomodulatory and antiviral effects.^{20,21}

COVID-19 infection attracts the attention of both health professionals and all individuals for different reasons since it is a novel viral infection, has no known treatment yet, is an alarming pandemic requiring urgent measures and treatment strategies, and is considered a pandemic with a rapid spread worldwide. In addition to visual and written media, the awareness of individuals has been increasing more through the social media. Individual interaction rates have increased due to the increase in cross communication tools in the digital age. With the quarantine measures and practices that restricted the social life, people have tended to use social media more frequently. In this period, it can be argued that there has been an increase in the online search about the COVID-19 infection, disease prevention or treatment methods. At the same time, the information obtained through various digital media providers could be shared without confirming their accuracy. In Turkey, alternative herbal treatment methods are often discussed on television shows, particularly about the topics such as cancer and healthy lifestyle. It can be argued that the increase in social media posts regarding the effectiveness of these treatment methods in COVID-19 infection has increased the rate of people searching for information about the topic on the internet.

Recently, GTTM has been the most popular tool for addressing health issues and issues related to the use of internet data.¹⁰ The information obtained from the internet has recently been recognized as a valuable tool for epidemiological research.⁴ It is believed that vitamin D, vitamin C, and hydroxychloroquine treatments can be

useful in COVID-19 infection.²²⁻²⁴ It was observed that there has been a rapid flow of information on the topic about this agents on the social media in Turkey, particularly with the guidance of the scientists who provide information on television programs broadcasted in the evening. In fact, a significant level of awareness and fear could have been created in the public, with the acknowledgements that increased after the identification of the first case in Turkey on March 11th, 2020 as well as the information and videos broadcasted in our country about the fight against COVID-19 in Italy. According to the GTTM analysis of Turkey as of the indicated dates, there have been an intensive search for COVID-19 and treatment methods in March. It was observed that the search on zinc, thyme, sumac, ginger and propolis peaked at certain periods. It was also observed that the online search about vitamin C and vitamin D peaked especially in the early stages of the pandemic. In fact, a carbonated beverage with low dose of quinine is seen to be searched intensively for a short period of time, considering that it could prevent the disease. It was noteworthy that the search on GTTM about these food derivatives increased particularly during the periods when the relevant video, message and image sharing increased on social media. This can be argued as an indicator that the people have an interest in and awareness about this disease. All these indicators are important in terms of demonstrating that the behavioral patterns of the people can be obtained from online searches in daily life. Accordingly, it was observed that the searches of people for COVID-19 declined to extremely low levels with the prolongation of the epidemic period. This can be considered as an indication that the presence of the disease has become ordinary for people, it has been accepted as a part of the life, and the fear experienced in the early periods of the disease have decreased.

Conclusion

With the COVID-19 infection, it was observed that all the people in the world could interact simultaneously due to the improved communication opportunities of today. It is clear that any information about the disease would attract the people during this period; therefore, it is extremely important to disseminate accurate information. It should also be considered that people can lose their lives due to any false practices. Data on internet browsing could be used for identifying the characteristics of the search made by the people on the treatment of the diseases during the pandemic.

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Conflicts of interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, shareholding and similar situations in any firm.

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