

## Applications of Dietary Supplements and Aromatherapy for Prophylactic and Treatment Purposes During COVID-19 Pandemic

**Short Title in English: Applications during COVID-19 pandemic**

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### ABSTRACT

**Objectives:** The lack of a specific proven treatment for COVID-19 has led individuals to use different treatment options. Although their effects on COVID-19 have not been proven, interest in dietary supplements and aromatherapy has increased during the pandemic period. In this study, usage of dietary supplement and aromatherapy were investigated for COVID-19 among individuals living within the borders of Turkey.

**Materials and Methods:** This cross-sectional survey study was conducted among 310 individuals. The questionnaire was prepared using online Google Forms and communicated to the participants via social media platforms. The data obtained from the study were analyzed with the statistical program.

**Results:** The analyzes of the survey revealed that participants increased the usage of supplements mostly prophylactic and also for treatment purposes during COVID-19 pandemic, 31.9% individuals declared that they consume herbal tea / product, 38.1% of them use vitamin/mineral supplement (multivitamin-mineral, vitamins B1,B6,B12,C,D, calcium, coenzymeQ10, iron, magnesium, selenium, zinc) and 18.4% of the individuals applied aromatherapy (treatment with essential oils). As a result of the study, the most commonly used supplement was vitamin D, the most commonly consumed tea was green tea and the essential oil was thyme oil, additionally, the most eaten vegetable was garlic. Moreover, other frequently used herbal products were containing ginger, onion as food, peppermint and eucalyptus oils as aromatherapeutics. Participants often reported that they find safe for using the elevated level of herbs or herbal products against COVID-19.

**Conclusions:** Among the individuals participating in this study, it has been observed that the use of dietary supplements has increased during the COVID-19 pandemic period. The study revealed that vitamin D is prominent in self-medication use. Moreover, interest in

aromatherapy has increased as well as dietary supplements. Among aromatherapeutics thyme stood out over the applied essential oils.

**Keywords:** COVID-19, dietary supplements, Turkey, herbal, essential oil

## INTRODUCTION

New coronavirus disease (COVID-19), which appeared in December 2019, was declared as a pandemic by the World Health Organization (WHO) on March 11, 2020,<sup>1</sup> following days, Turkey's first cases were detected.<sup>2</sup> With the epidemiological update published by WHO on March 30th, 2021, the weekly number of cases exceeded 3.8 million worldwide. More than 64.000 new deaths have been reported. Since the beginning of the pandemic, the number of patients infected with COVID-19 is more than 126 million and unfortunately close to 3 million deaths have been reported. In Turkey, the number of weekly cases almost 190 thousand and number of weekly death was almost a 1000. From the beginning of the pandemic in Turkey, the number of patients infected with COVID-19 virus surpassed 3 millions and more than 30 thousand deaths was recorded.<sup>3</sup>

Since there are no proven complete treatment options for COVID-19, compliance with wearing masks, hygiene rules, keeping distance, and a balanced food intake is the most effective approach so far. Healthy eating guidelines have been published to strengthen immunity and prevent COVID-19 contamination. Recommendations on optimal nutrition, good hygiene practices and the use of dietary supplements have been reported.<sup>4,5</sup> The vitamins; A, B6, B12, C, D, E and the minerals; selenium, zinc have been shown to support immunity by affecting the production and function of antibodies and B and T cells.<sup>6</sup> Dietary supplements such as cinnamaldehyde, curcumin, lactoferrin, probiotics, quercetin, vitamin D, vitamin C, zinc, and selenium have immune-boosting, antiviral, antioxidant, anti-inflammatory effects.<sup>7</sup> This has increased the interest in dietary supplements during pandemic. Increasing their advertisements in the media caused unconscious selection and use.<sup>8</sup> Whereas, high doses of dietary supplements can cause side and even toxic effects.<sup>9,10</sup> Moreover, it may interact with drugs taken together.<sup>10,11</sup>

Based on the scientific evidence, essential oils have antiviral, anti-inflammatory, immunomodulatory, and bronchodilatory activities. Due to their lipophilic nature, it has been suggested that essential oils (e.g. eucalyptus, garlic) can easily penetrate viral membranes, inhibit viral replication and be used for COVID-19.<sup>12</sup> In the treatment of respiratory tract infections, essential oils are applied topically, orally and by inhalation. In topical application, the diluted essential oil is applied to the back, chest and soles of the feet. Application to the chest and back area provides sinus drainage and relaxation of sputum. As a result of the application to soles of the feet, essential oils can be absorbed into the bloodstream, following with a pharmacological effect, only with a poor absorption. Oral intake of essential oils is not usually recommended for the safety reasons, additionally, if taken orally, it is diluted in water or formulated by encapsulation. When essential oils are administered by inhalation, they are distributed to the lungs with 50.0% effective bioavailability and reach the smallest cavities.<sup>13</sup> Aromatherapy has been used in the prevention of plague throughout history. Different forms of application of aromatherapy are used in Traditional Chinese Medicine and have also been used during COVID-19. Given China's position in epidemic prevention, aromatherapy has been suggested to boost immunity, prevent and control COVID-19.<sup>14</sup>

Dietary supplement and aromatherapy applications of individuals against COVID-19 have been investigated in many countries. In Poland, during the COVID-19 pandemic, increased use of immune-related nutrients and foods such as vitamins C and D, zinc, garlic (*Allium sativum* L.- Alliaceae), ginger (*Zingiber officinale* Roscoe- Zingiberaceae), or turmeric (*Curcuma longa* L.- Zingiberaceae) has been reported.<sup>15</sup> In Bangladesh, a study revealed that 57.6% of the individuals used herbal food / products and 11.2% both drugs and herbal

food/products as a preventive measure against COVID-19. Black seed (*Nigella sativa* L.-Ranunculaceae), clove (*Syzygium aromaticum* (L.) Merr. & L.M.Perry-Myrtaceae), ginger (*Zingiber officinale* Roscoe- Zingiberaceae), and honey are among the herbal food / products used, and *Arsenicum album* (homeopathic drug), vitamins and zinc supplements are the most used food supplements.<sup>16</sup> Vitamin C was used frequently in Saudi Arabia and Egypt,<sup>17,18</sup> ginger (47.2%) and turmeric (31.6%) were frequently used in Egypt. The application of these herbs during COVID-19 was associated with age and fear score.<sup>18</sup> In an observational study with participants from three countries; Sweden, UK and the USA, it was found that the use of probiotics, omega-3 fatty acids, multivitamin and vitamin D reduced the risk of being infected with COVID-19. On the other hand, was not associated with the consumption of zinc, vitamin C and garlic supplements.<sup>19</sup> In West Nusa Tenggara region, use of essential oils, the use of eucalyptus (*Eucalyptus* sp.- Myrtaceae), lemon (*Citrus limonum* Risso-Rutaceae), lemongrass (*Cymbopogon flexuosus* Stapf- Poaceae), lavender (*Lavandula* L. sp.-Lamiaceae) oils were determined during the pandemic period.<sup>20</sup>

The goal of the study is to evaluate the use of dietary supplement and aromatherapeutics used against COVID-19 and the frequency of use. In order to analyze in more detail the use of dietary supplements, the use of herbals, vitamins and minerals were questioned separately. The application of essential oils in terms of both oral and other usage methods were also questioned. This study is a comprehensive study that questions both dietary supplements and aromatherapy applications. It is important since it is one of the rare studies, in which the use of essential oil is also questioned.

## **MATERIALS AND METHODS**

The research conducted as a cross-sectional survey, in which questionnaire was prepared using online Google Forms, between March 1<sup>st</sup> and March 10<sup>th</sup> 2021, which was held in various provinces of Turkey. Approval was obtained from Gazi University Ethics Committee (22.02.2021-E.33174) for the study. 310 voluntarily participated individuals, aged 18 and older, working-living in the borders of Turkey has been included. It has been communicated to the participants that meet the inclusion criteria through social media platforms, such as WhatsApp. The questionnaire form was prepared by scanning the present literature. Overall 26 questions that questioning the descriptive characteristics of individuals, the use of herbs/herbal products, vitamins/minerals and aromatherapy applications against COVID-19. In the first 14 questions of the survey, the descriptive characteristics of the individuals, whether they were infected with COVID-19 and whether they had influenza and/or pneumonia vaccine during the COVID-19 pandemic process were asked. Herbal/herbal products, vitamins/minerals, aromatherapy applications and essential oil, frequency of use have been researched. Individuals were asked in a separate question whether there are any herbs/herbal products that they consume as food or not. In this survey, whether individuals found the use of herbs / herbal products safe for COVID-19 were questioned. Scoring was done on a scale of 1 to 5, in which 1 point 'I never find it reliable'; 5 points corresponds to "I find it reliable". The data obtained from the study were analyzed with the Statistical Package for the Social Sciences (SPSS) statistical program. The frequency of participant responses is shown in tables and figures. Cross tables were created to correlate the responses and chi-square tests were conducted. The level of significance for all the statistical analyzes were accepted as  $p < 0.05$ . Cramér's V ( $\phi_c$ ) value was calculated to determine the strength of the relationship between the variables. It takes on values between 0 and 1 (inclusive), in which, 0 corresponds to no relationship between the variables, while 1 corresponds to one variable being completely determined by the other.

## **RESULTS**

### ***Characteristics of participants***

The characteristics of the participants are shown in detail in Table 1 in which, total of 310 individuals, 223 (71%) of whom were women, participated in this survey study. The province with the highest participation rate was Ankara followed by Bursa and Hatay where the participants live. The majority of the individuals between the ages of 30 and 44. The most involved occupational groups are healthcare professionals, whom are 61.3% of were pharmacists. The majority of the participants (79%) declared that do not consume alcohol, while 22.6% of the participants still smoke, only 6.5% have smoked and quit in a period of their lives, moreover, 21% of the participants were having chronic illnesses. Among the participants 48 individuals (15.5%) who had COVID-19 disease previously, and only 1 of them hospitalized. Most of the participants did not have influenza or pneumonia vaccine during the pandemic period.

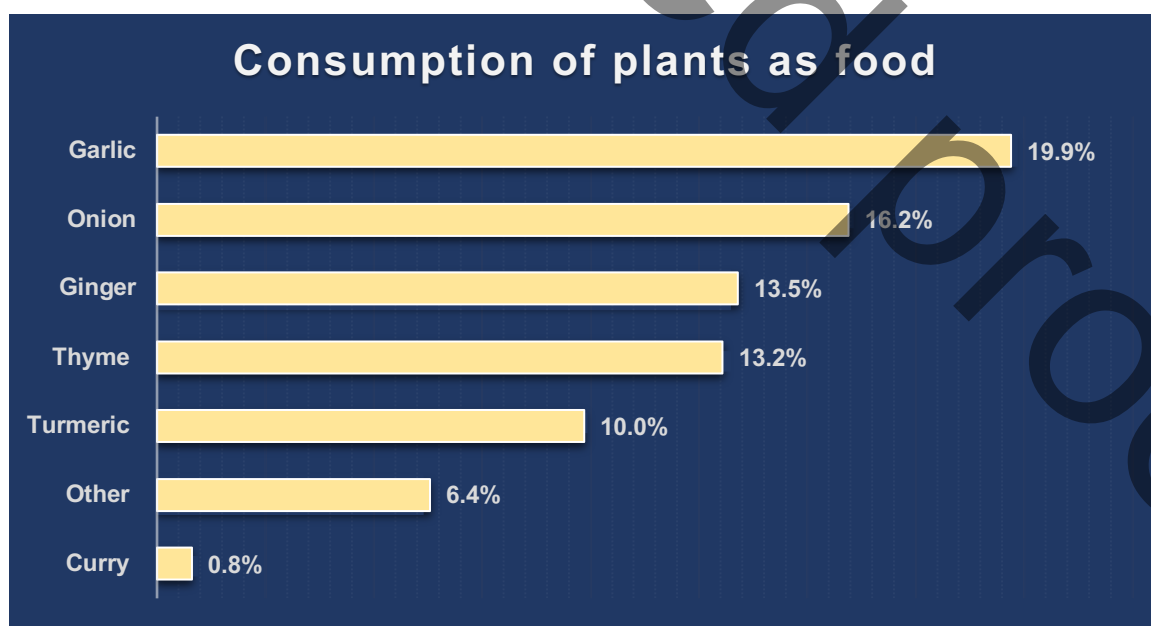
**Table 1.** Characteristics of participants (n= 310)

<b>Characteristics</b>	<b>Number of participants (n)</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Female	223	71,9
Male	87	28,1
<b>Age</b>		
18-29	105	33,9
30-44	128	41,3
45-59	61	19,7
≥60	16	5,2
<b>Marital status</b>		
Married	202	65,2
Unmarried	108	34,8
<b>Smoking</b>		
Yes	70	22,6
No	220	71,0
Quit smoking	20	6,5
<b>Alcohol consumption</b>		
Yes		
No	20	6,5
Sometimes	245	79,0
	45	14,5
<b>Profession</b>		
Healthcare professionals	75	24,2
Civil servant	72	23,2
Housewife	33	10,6
Student	32	10,3
Self-employment	26	8,4
Retired	12	3,9
Other	60	19,4
<b>Healthcare professionals</b>		
Pharmacist		
Doctor	46	61,3
Nurse	15	20,0
Dentist	4	5,3
Physiotherapist	3	4,0
Other	2	2,7

	5	6,7
<b>Chronic disease</b>		
Yes	65	21,0
No	245	79,0
<b>Infected with COVID-19</b>		
Yes	48	15,5
No	262	84,5
<b>Hospital treatment for COVID-19</b>		
Yes	1	0,3
No	309	99,7
<b>Influenza (flu) vaccine during the COVID-19 pandemic process</b>		
Yes	13	4,2
No	297	95,8
<b>Pneumonia vaccine during the COVID-19 pandemic process</b>		
Yes	21	6,8
No	289	93,2

#### ***Dietary supplement consumption and aromatherapy applications***

The graphic regarding the consumption of herbs is shown in Figure 1. Among the participants, 123(39.7%) of them reported that they did not increase the consumption of the vegetables in their diet during the COVID-19 pandemic. On the other hand, among the rest of the participants garlic, followed by onion was the most consumed food.



**Figure 1.** Edible plant and their products that the participants increased their consumption as a food during the pandemic.

The frequency of drinking herbal tea, vitamin-mineral supplement and aromatherapy for COVID-19 is shown in Table 2. The vast majority (81.8%) of individuals who used herbal tea or herbal products to protect themselves from COVID-19 during the pandemic period were not infected with COVID-19. Moreover, (81.6%) of people, who used and stopped consuming herbal tea or herbal products for a while were not infected with COVID-19.

**Table 2.** Usage frequency of herbal tea/product, vitamin/mineral supplements and aromatherapy

Variables	Number of participants (n)	Percentage (%)
<b>Do you use herbal tea or herbal product to protect against COVID-19?</b>		
Yes	99	31,9
No	162	52,3
I used and stopped	49	15,8
<b>Do you use vitamin / mineral supplements to protect against COVID-19?</b>		
Yes	118	38,1
No	129	41,6
I used and stopped	63	20,3
<b>Do you apply aromatherapy (treatment with essential oils) for COVID-19?</b>		
Yes	57	18,4
No	235	75,8
I applied and stopped	18	5,8

Among these applications, mostly green tea and herbal products containing ginger used to protect against COVID-19, detailed results of using herbal tea or herbal products for the protection from COVID-19 are shown in Table 3. Individuals, who infected with COVID-19 consumed mostly thyme hydrosol and herbal products, which contain ginger during their healing stage at home. However, as a result of the statistical analysis, no significant relationship was found between the use of herbal tea or herbal products and the state of the infection with COVID-19 ( $p>0.05$ ). Herbal tea/product was mostly used by individuals between the ages of 30-44 to protect against COVID-19 (33.3%). A significant relationship was found between the use of herbal tea/product and age ( $p<0.05$ ).

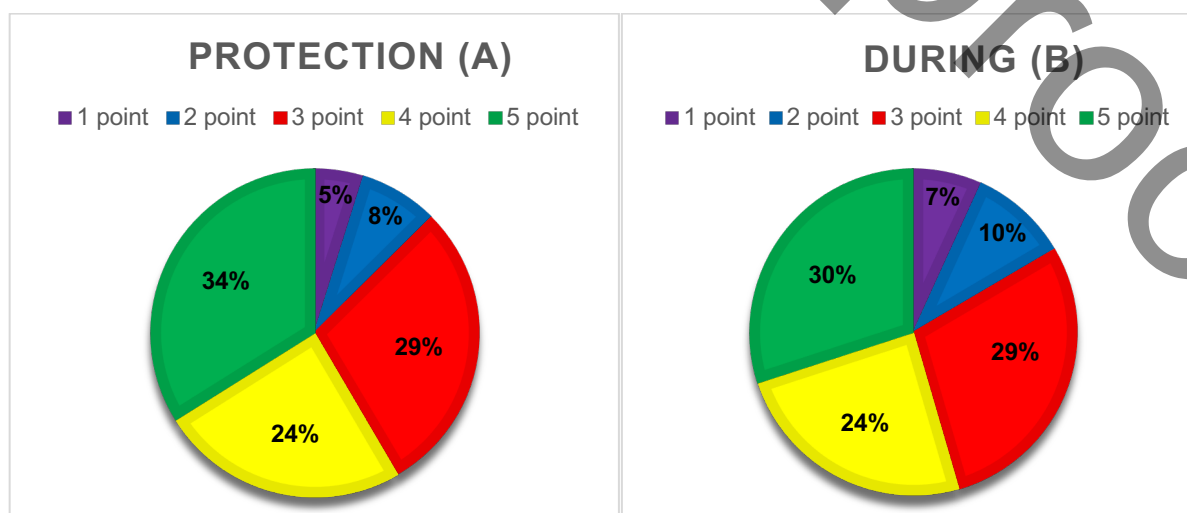
**Table 3.** Herbal tea or herbal product use among the participants

Herbal tea/ herbal product	I don't use *n(%)	I use it to protect against COVID-19 *n(%)	I only used it during my COVID-19 disease *n(%)	I have used it during my COVID-19 disease and I use it to protect against COVID-19 *n(%)
Herbal product containing ginger	227 (73,2%)	74 (23,9%)	5 (1,6%)	4 (%1,3)
Herbal product containing turmeric	247 (79,7%)	57 (18,4%)	3 (1,0%)	3 (%1,0)

Herbal product containing curcumin	287 (92,6%)	22 (7,1%)	0	1 (0,3%)
Elderberry (Sambucol®)	255 (82,3%)	52 (16,8%)	2 (0,6%)	1 (0,3%)
South African Geranium (Umca®)	288 (92,9%)	20 (6,5%)	2 (0,6%)	0
Green tea	223 (71,9%)	79 (25,5%)	5 (1,6%)	3 (1,0%)
Thyme hydrosol	247 (79,7%)	51 (16,5%)	9 (2,9%)	3 (1,0%)
Thyme oil	275 (88,7%)	28 (9,0%)	6 (1,9%)	1 (0,3%)
Herbal product containing thyme	263 (84,8%)	41 (13,2%)	4 (1,3%)	2 (0,6%)
Herbal product containing carvacrol	291 (93,9%)	16 (5,2%)	2 (0,6%)	1 (0,3%)
Black cumin essential oil	251 (81,0%)	53 (17,1%)	4 (1,3%)	2 (0,6%)
Peppermint essential oil	282 (91,0%)	25 (8,1%)	3 (1,0%)	0
Eucalyptus essential oil	285 (91,9%)	24 (7,7%)	1 (0,3%)	0
Echinacea	295 (95,2%)	13 (4,2%)	2 (0,6%)	0
Ginseng	299 (96,5%)	6 (1,9%)	4 (1,3%)	1 (0,3%)

\*n(%): Number (percentage)

In order to protect themselves from COVID-19 infection, 33.9% of the participants responded the use of herbs or herbal products to be very reliable, whereas 4.8% never find it reliable. Among the participants, 30% of them found herbs and herbal products very reliable, whereas 6.8% never find it reliable while having COVID-19 infection (Figure 2).



**Figure 2.** (A) The percentage of participants find the use of herbal products safe for protection COVID-19; (B) The percentage of participants find the use of herbal products safe during COVID-19

People who filled questionnaire (38.1%) reported that they used vitamin/mineral supplements to protect against COVID-19, and also 20.3% utilized and quit for a period. Vitamins D and C are the most commonly used vitamins by individuals to protect against COVID-19 (Table 4). Individuals infected with COVID-19 also reported that they used vitamins D and C the most, respectively. 80.5% of individuals who used vitamin/mineral supplements to protect against COVID-19 during the pandemic period were not infected with COVID-19. Also 85.7% of individuals who used and stopped vitamin/mineral supplements for a while were not infected with COVID-19. However, as a result of the statistical analysis, no significant relationship was found between the use of vitamin/mineral supplements and the state of infection with COVID-19 ( $p>0.05$ ). Similar to the use of herbal tea/product, a significant relationship was found between the use of vitamin/mineral supplements and age, and it was mostly used in individuals between the ages of 30-44 (46.6%,  $p=0.01$ ).

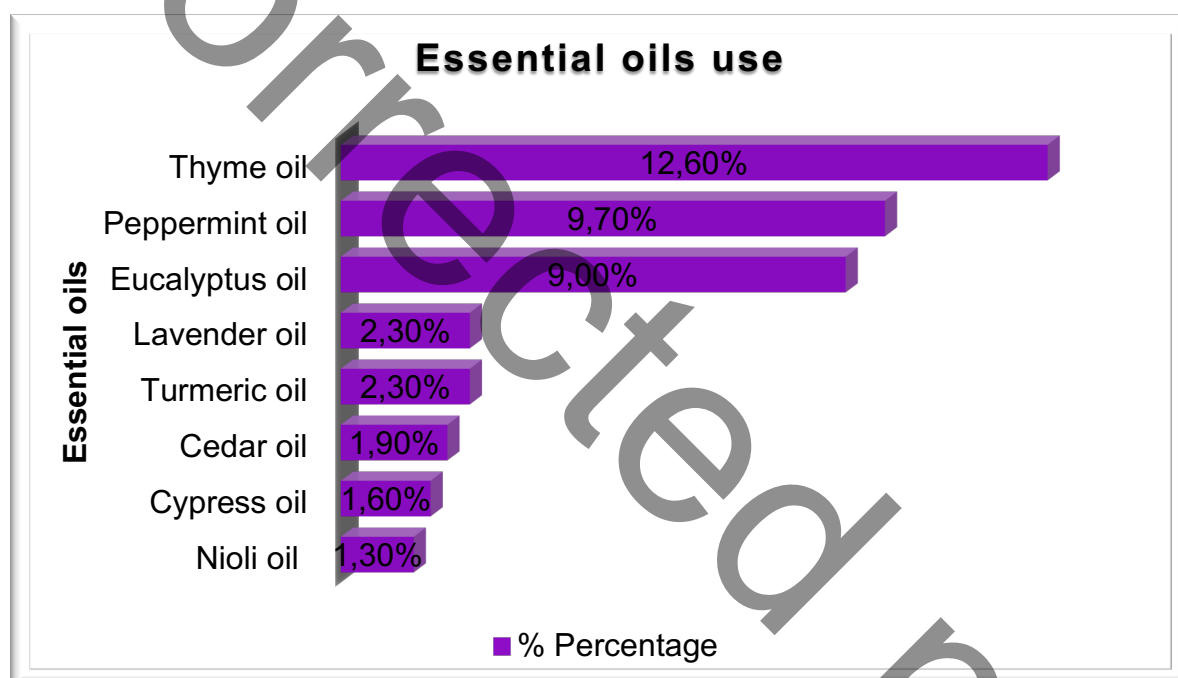
**Table 4.** Vitamin/ mineral supplements use

<b>Vitamins/ minerals</b>	<b>I don't use *n(%)</b>	<b>I use it to protect against COVID-19 *n(%)</b>	<b>I only used it during my COVID-19 disease *n(%)</b>	<b>I have used it during my COVID-19 disease and I use it to protect against COVID-19 *n(%)</b>
Multivitamin- mineral	237 (76,5%)	64 (20,6%)	8 (2,6%)	1 (0,3%)
Vitamin B12	237 (76,5%)	66 (21,3%)	5 (1,6%)	2 (0,6%)
B1+B6+B12	260 (83,9%)	43 (13,9%)	5 (1,6%)	2 (0,6%)
Vitamin C	156 (50,3%)	144 (46,5%)	6 (1,9%)	4 (1,3%)
Vitamin D	142 (45,8%)	153 (49,4%)	10 (3,2%)	5 (1,6%)
Iron	265 (85,5%)	41 (13,2%)	3 (1,0%)	1 (0,3%)
Zinc	239 (77,1%)	63 (20,3%)	4 (1,3%)	4 (1,3%)
Magnesium	257 (82,9%)	52 (16,8%)	0	1 (0,3%)
Calcium	274 (88,4%)	33 (10,6%)	3 (1%)	0
Selenium	287 (92,6%)	23 (7,4%)	0	0
Coenzyme- Q10	279 (90,0%)	28 (9,0%)	3 (1,0%)	0



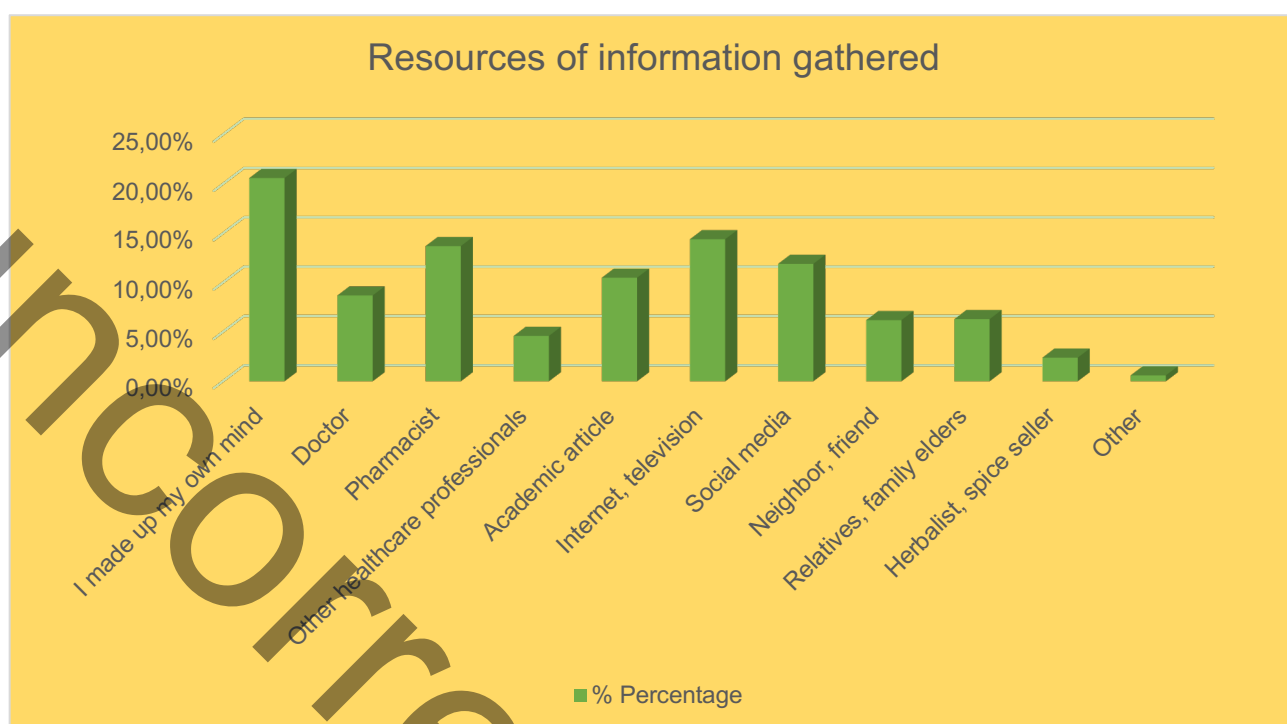
\*n(%): Number (percentage)

The essential oils, utilized by entities in aromatherapy applications and their usage rates are shown in Figure 3. Only 24.2 % of the individuals participating in the study do practice aromatherapy during the pandemic. Individuals who used aromatherapy reported that they mostly consumed thyme (*Thymus* L. sp. or *Origanum* sp.-Lamiaceae), peppermint (*Mentha* L. sp.-Lamiaceae), and eucalyptus (*Eucalyptus* sp.- Myrtaceae) oils, among them 80.7% of individuals were not infected with COVID-19, moreover, 83.3% of the individuals who applied and stopped the aromatherapy application for a while were not infected with COVID-19. However, no statistically significant relationship was found between aromatherapy applications and COVID-19 infection status ( $p > 0.05$ ). The individuals who applied aromatherapy were mostly in the 30-44 age group (36.8%), consequently, a significant relationship between aromatherapy practice and age ( $p < 0.05$ ) was determined.



**Figure 3.** Use of essential oils during pandemic

As for the information, gathered by the participated individuals, in order to use dietary supplements or aromatherapy, 30% of the individuals responded via the internet and television (Figure 4), whereas individuals who stated that they received advice from healthcare professionals whom were pharmacists the most.



**Figure 4.** Information resources of participants using herbs

Cross tabulation was made to determine the relationship between the information sources and the use of herbal tea/products (Table 5). As a result of the statistical analysis, a significant relationship was obtained between the individuals using herbal tea/ products and the information sources they relied. Further analysis showed that there was a significant correlation between learning the use of herbals from pharmacists, academic articles, social media, neighbors, friends, relatives and family elders ( $p < 0.05$ ).

**Table 5.** The relationship between information sources and use cases of herbal tea/products

	Do you use herbal tea or herbal products to protect yourself from COVID-19 during the pandemic period?			
	Yes *n	No *n	I used and quit *n	Significance
I made up my own mind	43	67	20	$p > 0.05$
Pharmacist	39	30	17	$p = 0.001$ $X^2 = 14.762$ $\phi c = 0.218$
Academic article	32	23	11	$p < 0.01$ $X^2 = 12.094$ $\phi c = 0.198$
Internet, television	31	45	15	$p > 0.05$
Doctor	21	21	13	$p > 0.05$

Social media	21	29	25	$p < 0.001$ $X^2 = 23.205$ $\phi c = 0.274$
Neighbor, friend	13	14	12	$p < 0.05$ $X^2 = 8.631$ $\phi c = 0.167$
Other healthcare professionals	12	10	7	$p > 0.05$
Relatives, family elders	10	18	12	$p < 0.05$ $X^2 = 7.008$ $\phi c = 0.150$
Herbalist, spice seller	6	4	5	$p > 0.05$

\* n: Number, X<sup>2</sup>: Chi-square,  $\phi c$ : Cramér's V

## DISCUSSION

Since the beginning of the COVID-19 pandemic, studies accumulated in the literature about investigating the use of dietary supplements. As far as we know, there were no studies questioning the use of aromatherapy and essential oil in addition to dietary supplements in the same questionnaire. In this study, we investigated the use of dietary supplements and aromatherapy applications in Turkey for COVID-19. In our study, the province with the highest participation rate was from Ankara, the capital of Turkey and the highest participation rate of individuals were healthcare workers. Among the participants' who smokes, consume alcohol were significantly low that might suggest that the participants of this survey are particularly conscious about their health. On the other hand, although most of them healthcare professions it is surprising that the majority of the participants neither had flu nor pneumonia vaccine during the period that we questioned them. This may be due to the fact that the Turkish Ministry of Health gives priority to the elderly people over a certain age in vaccination, since most of the participants are between the ages of 30-44 and the number of vaccines were insufficient.

In this study less than half of the participants who are mostly between the age of 30-44, used dietary supplements for COVID-19 (31.9% herbal tea/product, 38.1% vitamin/mineral supplement), moreover, fewer participants (18.4%) practiced aromatherapy. Additionally, the participants used and quit using herbal tea/product, vitamin/mineral dietary supplements and aromatherapy applications were 15.8%, 20.3%, 5.8%, respectively. Consequently, the most commonly used dietary supplements were vitamin D, vitamin C, green tea and herbal product containing ginger, respectively. Vitamins C, D and zinc have been highlighted for immune support<sup>6</sup>, and our findings are consistent with that reported. Recent studies have suggested that vitamin D is effective in protecting from COVID-19 infection and reducing the severity of the existing symptoms.<sup>21</sup> A meta-analysis showed that vitamin D has a slight effect on protection from acute respiratory infections.<sup>22</sup> Findings show garlic and onion to be the most consumed foods. It has been suggested that garlic has antiviral, anti-inflammatory effects, strengthens immunity and is effective in preventing COVID-19.<sup>23,24</sup> Although some compounds derived from garlic and onions have been shown to be effective for COVID-19 *in silico* studies, their usability for COVID-19 has not been proven.<sup>25</sup> Mhatre et al.<sup>26</sup> suggested that green tea polyphenols can be used in the prophylaxis and treatment of COVID-19 due to their antiviral activity. In a previous randomized controlled study, taking capsules containing green tea catechins and theanine prophylactically prevented influenza infection among healthcare professionals.<sup>27</sup> Based on these studies, green tea polyphenols may be an option for

protection from COVID-19. However, the amount of catechin in the content of green tea prepared and consumed as tea may not be sufficient for the dose required for COVID-19 prophylaxis. As a matter of fact, according to the results of the research, there was no significant relationship between the consumption of dietary supplement and protection from COVID-19.

This study demonstrated that participants applying aromatherapy mostly used thyme, peppermint and eucalyptus oils. This result is not surprising as these essential oils have been shown to be effective against respiratory system pathogens.<sup>13</sup> In addition to all these, essential oils are also used in aromatherapy for stress and sleep control.<sup>28</sup> Application of aromatherapy might be useful for controlling stress in individuals caused by COVID-19 pandemics. Interestingly, our findings showed that lavender oil, which is known to have an anxiolytic effect<sup>29</sup>, was used at a low rate by the study participants (2.3%). In our study, we questioned the use of different forms of thyme and its components. Under the title of herbal tea / product, in any period of the pandemic, the rate of use of thyme juice was 20.3%, oregano oil was 11.3%, herbal product containing thyme was 15.2% and carvacrol-containing herbal product usage rate was 6.1%. The rate of thyme oil usage was determined as 12.6% that might be the results of previous studies, which demonstrated the antiviral effect of thyme and its components in previous and *in silico* studies against COVID-19.<sup>30,31</sup> It has been shown that different thyme preparations and thymol can be used in respiratory system disorders due to its antispasmodic, antitussive, mucolytic and expectorant properties.<sup>32</sup> In a randomized clinical study on patients having COVID-19, oral intake of thyme essential oil significantly reduced the severity of symptoms such as fever, cough, shortness of breath, dizziness, muscle pain, anorexia, weakness, lethargy, and fatigue.<sup>33</sup> In a randomized controlled clinical trial, inhaled thyme essential oil improved the respiratory tract condition of patients under mechanical ventilation. As a result of the study, thyme essential oil reduced the concentration of airway secretions, facilitated the evacuation of mucous secretions, and had a bronchodilator effect.<sup>34</sup> Besides *in vitro* studies, clinical studies also demonstrated that thyme has a potential effect on COVID-19 and its symptoms, on the other hand, further studies should focus on the choosing appropriate thyme species, the preparation of the product and the route of administration. Individuals were asked, if they found the use of herbal tea / product safe for the prophylactic usage or for the treatment of COVID-19 infection. More than half of the individuals found the use of the herbal tea / product safe in both situations. Participants marked the option 'I made my own decision' (20.6%) for the source from where obtained the information about the usage of the non-pharmaceutical products. Apart from that, they gathered this information mostly through the internet and television (14.4%). The total of those who acquired information through healthcare professionals such as doctors, pharmacists etc. and academic articles is 37.5%, the rest gathered the information from unreliable sources. Moreover, the relationship between the source from which the information is learned and the use of herbal tea/product were evaluated. There was a significant relationship between herbal tea/product use and attaining information about the supplements from pharmacists, academic articles, social media, neighbors, friends, relatives and family elders.

#### **STUDY LIMITATIONS**

The number of participants was limited to 310, as it was planned as a quick study. The participation rate of the elderly population was low as the research was conducted online.

#### **CONCLUSION**

Interest in dietary supplements has increased during the pandemic period and non-medical information sources have been more effective in deciding on dietary supplements to utilize. Before the use of dietary supplements that recommended, their protective effects, side effects, drug interactions should be identified and the public should be informed about this issues. Studies have shown that essential oils have potential effects on COVID-19, therefore essential

oils should be included in published guidelines, and further randomized studies on essential oils should be the focus. Besides dietary supplements and aromatherapy application, the public should be cautious about nutrition, exercise, hygiene to overcome COVID-19 pandemic.

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