

# Supportive Product Use in Healthcare Professionals During the COVID-19 Pandemic: Survey Report

## COVID-19 Pandemi Döneminde Sağlık Profesyonellerinde Destekleyici Ürün Kullanımı: Anket Çalışması

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**ABSTRACT Objective:** In this survey study; we aim to investigate the approach of healthcare professionals (HCPs) to supportive products that are thought to have immune regulating, antioxidant or probiotic properties during the COVID-19 pandemic. **Material and Methods:** A total of 724 volunteers, consisting of doctors and nurses, participated. Demographic features, dietary supplement use and Hospital Anxiety Depression Scale-Anxiety (HADS-A) parameters were questioned. **Results:** In our study 72.8% of HCPs were using at least one dietary supplement during the COVID-19 pandemic period. We have found that 75.5% of women and 67.2% of men used at least one type of supportive product during the COVID-19 outbreak, and this difference was statistically significant ( $p=0.019$ ). Vitamin C (24.6%), vitamin D (17.5%), zinc (12.0%) multivitamin/mineral complexes (11.7%), ginger (11.5%) were most often preferred. No relationship was found between age and supportive product use (SPU) when evaluated separately for women and men. HADS-A score was significantly higher in women than in men. There was no correlation between age and HADS-A score ( $r=0.04$ ,  $p=0.378$ ). No relation was found between the use of supportive products and anxiety levels ( $p=0.183$ ). **Conclusions:** Our study objectively demonstrated that the rate of SPU was quite high in HCPs during the COVID-19 pandemic.

**Keywords:** COVID-19; healthcare personnel; dietary supplements; vitamin C; vitamin D; hospital anxiety Depression Scale-Anxiety

**ÖZET Amaç:** Bu anket çalışmasında, COVID-19 salgını döneminde sağlık profesyonellerinin bağışıklık düzenleyici, antioksidan veya probiyotik özelliklere sahip olduğu düşünülen diyet takviyelerine yaklaşımlarını araştırmayı amaçladık. **Gereç ve Yöntemler:** Doktor ve hemşirelerden oluşan, 724 kişiye anket soruları yöneltilerek demografik verileri, diyet takviyeleri kullanımı, Hastane Anksiyete Depresyon Ölçeği-Anksiyete (HADS-A) ile kaygı durumları sorgulandı. **Bulgular:** Çalışmamızda, COVID-19 pandemi döneminde HCP'lerin %72,8'i en az bir diyet takviyesi kullanıyordu. COVID-19 salgını sırasında kadınların %75,5'inin ve erkeklerin %67,2'sinin en az bir tip destekleyici diyet takviyesi kullandığını ve bu farkın istatistiksel olarak anlamlı olduğunu bulduk ( $p=0,019$ ). Vitamin C (%24,6), vitamin D (%17,5), çinko (%12,0), multivitamin / mineral kompleksleri (%11,7), zencefil (%11,5) en sık tercih edilen ürünlerdi. Kadınlar ve erkekler için ayrı ayrı değerlendirildiğinde, yaş ile destekleyici ürün kullanımı arasında ilişki bulunmamıştır. HADS-A skoru kadınlarda erkeklerden anlamlı olarak daha yüksekti. Yaş ile HADS-A skoru arasında korelasyon yoktu ( $r=0,04$ ,  $p=0,378$ ). Destekleyici ürünlerin kullanımı ile anksiyete düzeyi arasında ilişki bulunmadı ( $p=0,183$ ). **Sonuç:** Çalışmamız, COVID-19 pandemi döneminde sağlık çalışanlarında diyet takviyesi kullanım oranının yüksek olduğunu objektif olarak göstermiştir.

**Anahtar Kelimeler:** COVID-19; sağlık personeli; diyet takviyesi; vitamin C; vitamin D; Hastane Anksiyete Depresyon Ölçeği-Anksiyete

The coronavirus disease-2019 (COVID-19), which was declared as a pandemic by the World Health Organization on March 11, 2020, is a disease with consequences such as acute respiratory distress syndrome, multiple organ failure and, death as well as being a highly contagious disease.<sup>1</sup> Thus, it led to more serious

anxiety in the community, especially in individuals who are more at risk of transmission or death.<sup>2</sup> The Hospital Anxiety and Depression Scale-Anxiety or Depression (HADS-A or HADS-D) is a frequently used self-rating scale developed to assess psychological distress in non-psychiatric patients.<sup>3</sup> Recent studies using

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various scales, including the HADS-A and/or HADS-D have revealed that healthcare professionals (HCPs) with increased workload and high risk of transmission due to the pandemic suffer from higher rates of fear, anxiety and depression.<sup>4,5</sup> In another study, we reported that the stress levels of HCPs measured with HADS-A before and after the pandemic increased and this was associated with the increase in the frequency and severity of various dermatological disorders.<sup>6</sup>

It is stated that COVID-19 affects every age group, but the presence of low immunity, malnutrition, old age and, comorbidity are poor prognostic factors and, the risk of death increases exponentially in such patients.<sup>7,8</sup> It is recognized that changes in nutritional status have a wide variety of effects on immunity through hormonal, humoral, and cellular effects on the organism.<sup>8</sup> So, it is emphasized that evidence-based nutritional therapy, which is the mainstay of therapeutic principles, can be life-saving for critical COVID-19 patients.<sup>9</sup> During the pandemic period, there have been many broadcasts on how to strengthen immunity through various media organs, and it has been noted that advertisements related to vitamin and mineral supplements are frequently encountered. There may be a need for supportive product use (SPU) in healthcare professionals, which we can consider as a high-risk group for transmission. We think that our study, which we aimed to reveal the size of this need and its relationship with anxiety level, can give an idea about the approach of HCPs to supportive products.

## MATERIAL AND METHODS

In our study, a self-administered online questionnaire (SurveyMonkey®) was asked to HCPs consisting of doctors and nurses, who agreed to participate in the study between 10 and 25 June 2020. Voluntary enrolment to the study was performed in 3<sup>rd</sup> month after the first case in Turkey. The consumption of various products thought to have immune regulatory, antioxidant or probiotic properties were asked to the participants. Commonly consumed products such as yoghurt, honey, fruit and vegetables, and also par-enteral products, major ozone autohemotherapy and, antibiotic-antiviral drug use were not questioned. The current anxiety level of the participants was determined using the HADS-A with a score of 0-21 points,

which was composed of 7 questions and was validated in Turkish by Aydemir et al.<sup>10</sup>

Inclusion criteria such as being a doctor or nurse, working actively in any health step in Turkey and, completing the questionnaire were used. HCPs who did not work actively due to annual leave, retirement or sickness were excluded from the study.

Participant data were documented anonymized. The study was approved by the Ethics Committee of Regional Training and Research Hospital, Erzurum, Turkey (date: 15.06.2020, decision no: 2020/12-136) and was conducted as per the latest version of the “Helsinki Declaration” and the “Guidelines for Good Clinical Practice”.

Available data were collected from 724 volunteers. After checking the normality distribution of scale variables by the Kolmogorov-Smirnov test, independent samples were compared with the Mann-Whitney-U test. Pearson chi-square and Fisher’s exact test were used for categorical variables, where appropriate. The associations between age and HADS-A scores were examined using Spearman’s correlation analysis since the data were not suitable for normal distribution. A 5% type-1 error level was used to infer statistical significance. All procedures were conducted using IBM SPSS Statistics 21.0 and MS-Excel 2010.

## RESULTS

The study involved 724 volunteers [481 doctors (200 males and 281 females; 41.6% vs. 58.4%), 243 nurses (38 males and 205 females; 15.6% vs. 84.4%)]. Of all participants, 67.1% were females. The mean age of women was 33.8±8.4 and that of men was 33.0±8.2, and the groups were identical ( $p=0.872$ ). According to the jobs, the ages of the participants ranged from 24 to 68 years (mean±standard deviation (SD); 34±9 years) in doctors and 22 to 54 years (33±9 years) in nurses. While there was a statistically significant difference in terms of the gender distribution of doctors and nurses, the age distribution was identical ( $p<0.001$ ,  $p=0.110$ ; respectively) (Table 1). Comparison of SPU by gender and occupation is presented in Table 2. Thus, while investigating whether the use of supportive products and the products used

**TABLE 1:** Comparison of demographic data and Hospital Anxiety Depression Scale-Anxiety by gender and occupation.

	Gender			Profession		
	Female n=486	Male n=238	p value	Doctor n=481	Nurse n=243	p value
Age	33.8±8.4	3.0±8.2	0.872	34±9	33±9	0.110
Sex (male/female)	-	-	-	200/281	38/205	p<0.001
HADS-A score	9.3±3.5	7.3±4.0	p<0.001	8.3±3.8	9.4±3.7	0.005
HADS-A score in men (n=238)	-	-	-	7.2±3.8	8.0±4.7	0.537
HADS-A score in women (n=486)	-	-	-	9.1±3.5	9.6±3.5	0.248

HADS-A: Hospital Anxiety Depression Scale-Anxiety

Man-Whitney U test and Pearson's chi-square tests were used.

**TABLE 2:** Comparison of supportive product use by gender and occupation.

Product <sup>†</sup>	Gender			Profession (only for women)			
	Total n=724, 100%	Female n=486, 100%	Male n=238, 100%	p value	Doctor n=281, 100%	Nurse n=205, 100%	p value
Do you use any supportive products during the COVID-19 outbreak?							
No	197 (27.2%)	119 (24.5%)	78 (32.8%)	0.019	69 (24.4%)	50 (24.6%)	0.967
Yes	527 (72.8%)	367 (75.5%)	160 (67.2%)		212 (75.4%)	155 (75.6%)	
Vitamin C	178 (24.6%)	137 (28.2%)	41 (17.2%)	0.001	79 (28.1%)	58 (28.3%)	0.965
Vitamin D	127 (17.5%)	106 (21.8%)	21 (8.8%)	<0.001	71 (25.3%)	35 (17.1%)	0.031
Vitamin A	12 (1.7%)	8 (1.6%)	4 (1.7%)	1.000*	1 (0.4%)	7 (3.4%)	0.011*
Multivitamin & mineral complex	85 (11.7%)	63 (13.0%)	22 (9.2%)	0.144	38 (13.5%)	25 (12.2%)	0.667
Zinc	87 (12.0%)	71 (14.6%)	16 (6.7%)	0.002	51 (18.1%)	20 (9.8%)	0.010
Kefir	44 (6.1%)	39 (8.0%)	5 (2.1%)	0.002	27 (9.6%)	12 (5.9%)	0.132
Probiotic tablets	16 (2.2%)	13 (2.7%)	3 (1.3%)	0.224	9 (3.2%)	4 (2.2%)	0.398
Black cumin oil	20 (2.8%)	15 (3.1%)	5 (2.1%)	0.447	9 (3.2%)	6 (2.9%)	0.862
Ginseng	12 (1.7%)	9 (1.9%)	3 (1.3%)	0.760*	6 (2.1%)	3 (1.5%)	0.740*
Ginger	83 (11.5%)	75 (15.4%)	8 (3.4%)	<0.001	21 (7.5%)	54 (26.3%)	<0.001
Turmeric	56 (7.7%)	51 (10.5%)	5 (2.1%)	<0.001	20 (7.1%)	31 (15.1%)	0.004
Sumac	43 (5.9%)	32 (6.6%)	11 (4.6%)	0.294	9 (3.2%)	23 (11.2%)	<0.001
Pollen, propolis, royal jelly	50 (6.9%)	44 (9.1%)	6 (2.5%)	0.001	23 (8.2%)	21 (10.2%)	0.435
Other phytotherapy products or mixtures <sup>‡</sup>	44 (6.1%)	38 (7.8%)	6 (2.5%)	0.005	14 (5.0%)	24 (11.7%)	0.006
Ozone water or oil	4 (0.6%)	4 (0.8%)	0 (0.0%)	0.309*	4 (1.4%)	0 (0.0%)	0.142*
N-acetyl cysteine tablets	32 (4.4%)	23 (4.7%)	9 (3.8%)	0.559	22 (7.8%)	1 (0.5%)	<0.001

<sup>†</sup>Multiple product alternatives used by the participants can be selected. <sup>‡</sup>Herbal teas such as Salvia, Melissa, Fennel, Chamomile and etc.

Pearson's and \*Fisher's exact chi-square tests were used.

differed between occupations, only women volunteers were included in the analysis. 75.5% of women and 67.2% of men used at least one type of supportive product during the COVID-19 outbreak, and this difference was statistically significant (p=0.019). As seen in Table 3, no relationship was found between age and SPU when evaluated separately for women and men (p=0.220, p=0.588; respectively). In the doctor group, which consisted of 92 (19.1%) general practitioners, 289 (81.9%) specialists, there was no

relationship between the SPU and the presence of any specialty (p=0.124).

HADS-A score was significantly higher in women than in men (9.3±3.5, 7.3±4.0; respectively) (p<0.001). Doctors and nurses were identical in terms of anxiety level provided that men and women were evaluated separately (p=0.537, p=0.248; respectively) (Table 1). There was no correlation between age and HADS-A score (r=0.04, p=0.378). No relation was found between the SPU and anxiety level (p=0.183) (Table 3).

**TABLE 3:** Relationship of age and Hospital Anxiety Depression Scale-Anxiety with supportive product use and correlation with each other.

	Supportive product use		p value
	Yes	No	
Age in men	34±7	34±9	0.588
Age in women	33±7	34±9	0.220
HADS-A score	8.4±3.9	8.9±3.7	0.183
Correlation with age		r value	p value
HADS-A score		0.04	0.378
HADS-A score in men		0.06	0.484
HADS-A score in women		0.07	0.171

HADS-A: Hospital Anxiety Depression Scale-Anxiety  
Man-Whitney U test and Spearman's correlation analysis were used.

## DISCUSSION

The COVID-19 pandemic has created a global crisis environment, causing great fear and anxiety. Communities have resorted to various methods with proven protective efficacy recommended by health authorities, such as hygiene, quarantine practices, social distance, the use of masks, and personal protective equipment, to reduce the risk of infection and death.<sup>11</sup> However, due to the rapid increase in the number of cases and deaths, the long-term vaccine development program, and the limited medical treatments, the anxiety caused many individuals to turn to herbal traditional medicines. During the current general trend towards supportive products, the attitudes of HCPs, who are high-risk groups and representatives of modern medicine, are intriguing. In this study we conducted to investigate the approach of HCPs to supportive products, 72.8% of the volunteers stated that they used at least one supportive product during the pandemic. It was understood that the rate of SPU was also quite high in HCPs.

When the SPU rate was evaluated by gender, as it is noted in Table 2, this rate was statistically significantly higher in women (75.5%) than in men (67.2%). Besides, the rate of use of vitamin C, vitamin D, zinc, ginger, turmeric, pollen/propolis/royal jelly in women was statistically significantly higher than in men. Gardiner et al. reported that the rate of SPU was higher in women in the study in which they investigated the factors affecting the SPU in HCPs.<sup>12</sup> In the study conducted by Lai et al. in 1257, HCPs

working in the fight against COVID-19, they stated that depression and anxiety symptoms were more frequent and severe in women and nurses.<sup>2</sup> It is reasonable that the more serious fear and anxiety associated with COVID-19 in the female gender may be a contributing factor to this difference in SPU. Indeed, in our study, the HADS-A score in HCPs was significantly higher in women than in men. However, the fact that we did not find a relationship between SPU and anxiety level was contrary to this idea and interesting. According to the survey conducted by Modi et al., the level of knowledge about COVID-19 was higher in female HCPs than in men.<sup>13</sup> Although these data are not available in our study, we think that the increase in awareness depending on gender may be a triggering factor for the SPU.

In old age, there are problems such as decreased energy and food intake, digestive problems, multiple drug use, malnutrition and, the increasing psychological problems.<sup>14</sup> The frequency of SPU increases with aging.<sup>15-17</sup> It was not surprising that we found no relationship between age and SPU since our study included young-middle age, socially active adults. Although there are contradictory data about the relationship between psychiatric symptoms and age in the period of COVID-19 pandemic in the literature, it was reported that psychiatric symptoms were seen at a younger age in HCPs during the pandemic.<sup>18</sup> Since there was no specific scale for the fear of COVID-19 at the time when the study was planned, the HADS-A score was used to grade anxiety and depression. Although there was no relationship between HADS-A score and age; it is possible to get different results with the new scale, which provides a more detailed evaluation of COVID-19 fear and anxiety developed by Ahorsu et al.<sup>11</sup> Comparing the relationship between HADS-A and occupation, anxiety levels were significantly higher in nurses, a female-density group since the groups were not identical in terms of gender. However, when gender was adjusted, there was no difference between doctors and nurses in terms of anxiety levels. Besides, there was no significant difference in the frequency of SPU by specialist doctors and general practitioners.

Although opinions about the SPU such as herbal teas, essential oils, tinctures and, colloidal silver may

be effective in the prevention and treatment of COVID-19, there is no scientific evidence that any of these products can prevent or cure COVID-19.<sup>19</sup> However, some multivitamins and supplements have been reported to modulate immunity and reduce the risk of infection.<sup>15,20</sup> For example, vitamin C, a very important antioxidant agent, is known to have many important functions in promoting immunity, such as regulation of gene expression of proinflammatory cytokines and increasing microbial killing in cells.<sup>21,22</sup> Indeed, it has been claimed recently that high-dose vitamin C may be a part of COVID-19 management.<sup>23</sup> Besides, some studies have emphasized that in vitamin D deficiency, there is an increased risk of respiratory infections such as Respiratory Syncytial Virus (RSV), tuberculosis and, influenza.<sup>24-26</sup> Ilie et al. pointed out that there is a negative correlation between mean vitamin D levels in 20 European countries and COVID-19 cases and mortality.<sup>27</sup> It was stated in a meta-analysis that vitamin D supplements could be an effective tool to prevent respiratory infection.<sup>28</sup> Since zinc deficiency increases the susceptibility to infectious diseases by causing humoral and cell-mediated immune dysfunction, it has been reported that zinc replacement may be appropriate in the treatment of COVID-19.<sup>29</sup> In a recently published review, it has been stated that micronutrients with the strongest evidence in supporting immunity are vitamins C, D and zinc.<sup>20</sup> Many other current studies have suggested that multivitamins and dietary supplements can reduce COVID-19 infection and the risk of death.<sup>30,31</sup> According to our study, HCPs preferred vitamin C (24.6%), followed by vitamin D (17.5%), zinc (12.0%), multivitamin/mineral complexes (11.7%) and ginger (11.5%), respectively. In some studies investigating the SPU approach of HCPs before COVID-19, the frequency of SPU was found to be higher in those who had a high level of knowledge about these products and attended any nutrition and training program, and the most preferred products were reported as multivitamin complexes.<sup>15,30</sup>

The most important limitation is that this research is a narrow self-administered questionnaire study. It should also be noted that we have not ques-

tioned the level of knowledge of the patients about the supportive products they preferred. However, our aim was just to take a photo of the increase in the frequency of product use, which we observed in our environment and which we thought turned into herd behavior.

## CONCLUSION

As a result, complementary/supportive treatment products have been used throughout history and will continue to be used, due to its high commercial potential, possible therapeutic or, placebo effects. It is not surprising that the demand for supportive products for all segments of the society, including HCPs, has increased during the pandemic when the world has been inadequate in COVID-19 protection and treatment. It is noteworthy that our study demonstrates this objectively. We believe that we should not turn back to traditional treatment methods provided that we do not give up on evidence-based medicine and that more scientific researches should be conducted on SPU for public health.

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### Conflict 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, share holding and similar situations in any firm.*

### Authorship Contributions

**Idea/Concept:** Zeynep Utku, Çağrı Turan, Nurcan Metin; **Design:** Zeynep Utku, Çağrı Turan, Nurcan Metin; **Control/Supervision:** Zeynep Utku; **Data Collection and/or Processing:** Zeynep Utku, Nurcan Metin; **Analysis and/or Interpretation:** Zeynep Utku, Çağrı Turan; **Literature Review:** Zeynep Utku, Çağrı Turan, Nurcan Metin; **Writing the Article:** Zeynep Utku, Çağrı Turan, Nurcan Metin; **Critical Review:** Zeynep Utku, Çağrı Turan, Nurcan Metin.

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