

Measuring the Knowledge and Behaviors of University Students Toward Rational Use of Herbal Supplement Products in the COVID-19 Pandemic

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ABSTRACT

Objective: This study was planned to measure the knowledge and behavior of university students toward the rational use of herbal supplements during the COVID-19 pandemic.

Methods: It was carried out with students from Üsküdar University Faculty of Health Sciences and Health Services Vocational School. The study used a descriptive design and was completed with 640 students who volunteered to participate in the study. The data were collected by using a questionnaire including questions about students' rational use of herbal supplements according to their gender, faculty, the status of having had COVID-19 viral infection, and the status of having received education on pharmacology and medicinal plant products. Counts, mean scores, and percentage values were used in the evaluation of the data.

Results: It was found that 15.5% of the participants were from the Faculty of Health Sciences and their mean age was 20.8±2.84 years and that 84.5% were from the Health Vocational School and their mean age was 21.42±3.87 years. The rate of having had COVID-19 viral infection among students was 22.7%, having received pharmacology education was 75.5%, and having received education on medicinal plant products was 46.3%.

Conclusion: It was found that the pharmacology and medicinal plant products education received by the students studying health significantly affected the rational use of herbal supplements and that students should be given more education on phytotherapy.

Keywords: COVID-19, herbal supplements, students, rational drug use

1. INTRODUCTION

A new coronavirus disease (COVID-19) that broke out in Wuhan, the capital of Hubei province of China, in December 2019 and was defined by the International Virus Taxonomy committee as Severe Acute Respiratory Syndrome Coronavirus 2 (severe acute respiratory syndrome-related coronavirus 2 /SARS-CoV-2) has turned into a worldwide pandemic (1). This new coronavirus or severe acute respiratory syndrome coronavirus – 2 (SARS-CoV-2) has a high level of transmissibility from person to person. The World Health Organization (WHO) declared COVID-19 as a pandemic disease on March 11, 2020 (2-4).

With the onset of the COVID-19 pandemic in our country, the interest in herbal supplements has increased, because the COVID-19 viral infection, like all other viral infections, has been frequently on the agenda both on scientific platforms and social media with the news that it affects people with weak immune systems more. As a result, people have turned

to herbal supplements to keep their immune systems strong during the pandemic, and they are increasingly using these products. However, as we all know, herbal supplements do not always prove beneficial; they can also cause unwanted side effects (5).

The primary reasons why people use herbal supplements include improving the body condition, treating existing ailments, and avoiding drugs that are considered chemical (6). However, some plants can also show extremely toxic effects and cause unexpected side effects.

However, there is much less data on the interactions of plants used for treatment in chemical drugs with other drugs used. In this case, it is ignored that the preparation used may cause other complications (7). It is also stated that plants produce toxic substances to defend themselves. For this reason, the use of herbal supplements alone or in combination with other drugs may produce unexpected health outcomes.

In recent years, individuals have resorted to herbal supplements to cope with the health problems they experience and maintain their general health status or achieve a better level. The news circulating especially on social media channels that some drugs are made from herbal products and that herbal supplements are harmless and even more effective increases the use of herbal supplements (8).

COVID-19 initiates an inflammatory immune response. The release of inflammatory cytokines in a person with COVID-19 disease brings about a cytokine storm and immune impairment, which is followed by acute respiratory distress syndrome and multiple organ dysfunction (9,10). Therefore, it may be helpful to adopt healthy eating habits and using dietary or herbal supplements to support immunity and defend the body against adverse outcomes (11-13). The regulation of the immune function benefit from dietary and herbal supplements, and these supplements control both adaptive and innate immunity in many ways (14).

Dietary or herbal supplements have been stated to show antiviral activity against multiple virus strains, including human immunodeficiency virus, hepatitis B and C, herpes simplex virus, influenza viruses, and earlier coronaviruses, namely, SARS and MERS (15).

The use of herbal and dietary supplements has globally increased significantly during the COVID-19 pandemic. They are usually used alone or in combination with prescription drugs (16-21). In a meta-analysis of seven randomized controlled trials that investigated the effectiveness of herbal remedies in COVID-19 symptoms, such as fever and dry cough, it was reported that the use of herbal remedies and prescription medications in combination shortened the recovery time of these symptoms (16).

2. METHODS

2.1. Study Design and Data Collection

This study used a descriptive design and was carried out in the spring semester of the 2020-2021 academic year. It was conducted with 640 university students from Üsküdar University, Faculty of Health Sciences and Health Vocational Higher School, who agreed to participate in the research. The students who refused to participate in the study or those who submitted an incomplete questionnaire were excluded from the study. The data was solely collected using the Google Forms. The online questionnaire was then distributed over electronic media (WhatsApp, Email) using a snowball sampling method.

A total of 14 questions were asked in the questionnaire applied to the volunteer participants. The questions on the questionnaire were designed to measure the knowledge and behaviors of university students toward rational use of herbal supplement products in the COVID-19 Pandemic. The questionnaire is designed by in the light of our previous

studies about Rational Drug Use (22,23). In the questionnaire, the students were asked about their age, the department they are studying in, whether they regularly use prescription drugs, whether they use herbal supplements during their illness, whether they use herbal supplements to protect themselves from diseases during the COVID-19 process, who they get support from when they are sick, herbal supplements, and when they are sick. It was asked whether they benefited from supports or drugs, whether they benefited from herbal support recommendations for protection from COVID-19 in internet publications and social media, and whether they had knowledge about the side effects of herbal supplements. In addition, they were asked to whom they applied first in such a situation. In addition, the participants were asked whether they had received pharmacology training and whether they had taken courses on medicinal herbal products and whether they had COVID-19 infection. Responses collected through Google forms were evaluated statistically.

2.2. Ethical Considerations

Üsküdar University's Non-Interventional Research Ethics Committee approved (Decision No: 61351342/MAY 2021-44) the protocol of the present study and conducted within the framework of the Helsinki Declaration principles. Written and verbal consent of the individuals participating in the study was obtained after informing them about the purpose of the study.

2.3. Statistical Analysis

Within the scope of the research, the knowledge and attitudes of university students towards the rational use of herbal supplements and the use of herbal supplements during the COVID-19 pandemic were investigated. The items on the questionnaire prepared for this purpose were analyzed by using frequency and percentage distributions, as well as bivariate chi-square analysis.

3. RESULTS

Table 1 presents some descriptive characteristics of the students participating in the study. The mean age was 21.33 ± 3.73 . It was determined that 15.5% of them were from the Faculty of Health Sciences and 84.5% from the Health Vocational Higher School and that 22.7% of them had had COVID-19 viral infection. Also, 75.5% of these students had taken pharmacology courses, and 46.3% had taken courses related to medicinal plants along with pharmacology.

Table 2 presents the findings of the chi-square analysis conducted to compare the use of herbal supplements and knowledge and attitudes towards using herbal supplements by gender.

The comparison of the use of herbal supplements by gender indicated a significant difference in terms of using them for colds ($\chi^2 = 30.289$, $p < .05$), before COVID-19 ($\chi^2 = 7.182$, $p < .05$), and as primary option against diseases ($\chi^2 = 7.129$, $p < .05$).

.05). When the percentage distributions of these variables with significant differences were examined, it was found that 42.47% of the males and 60.32% of the females used herbal supplements for colds and that 31.51% of the males and 43.93% of the females used them before COVID-19. While the majority of the males (52.74%) used medication against diseases, the majority of the females (59.72%) turned to herbal supplements.

Table 1. Distribution of the participants' socio-demographic data

		n	%	Age (Mean ± SD)
Gender	Male	146	22.8	22.10 ± 3.97
	Female	494	77.2	21.10 ± 3.63
School	Faculty of Health Sciences	99	15.5	20.81 ± 2.84
	Health Vocational Higher School	541	84.5	21.42 ± 3.87
Status of having had COVID-19	Yes	145	22.7	21.59 ± 4.12
	No	495	77.3	21.25 ± 3.61
Pharmacology education	Yes	483	75.5	21.29 ± 3.32
	No	157	24.5	21.43 ± 4.78
Medicinal plants education	Yes	296	46.3	21.58 ± 3.96
	No	344	53.8	21.11 ± 3.52
Total		640	100.0	21.33 ± 3.73

SD: standard deviation

Regarding the comparison of knowledge and attitudes toward using herbal supplements by gender, there was a significant difference between genders in terms of sources of information about herbal supplements ($\chi^2= 8.101$, $p< .05$) and having knowledge about the side effects of herbal products ($\chi^2= 18.238$, $p< .05$). When the percentage distributions of these variables with significant differences were examined, it was found that males and females mainly learned about herbal supplements from the Internet, and this rate was 43.84% for males and 34.01% for females. The majority of the males and females knew that herbal products could have side effects, and this rate was 38.36% in males and 48.99% in females. While the females used the Internet less as a source of information compared to males, they had more information about the side effects of herbal products.

Table 4 shows the findings of the chi-square analysis conducted to compare the use of herbal supplements and

knowledge and attitudes toward using these supplements according to the status of having had the COVID-19 disease. While there was no significant difference in the knowledge and attitudes of the participants towards using herbal supplements according to the status of having had the COVID-19 disease ($p> .05$), a significant difference was found according to the variable of using herbal supplements during the COVID-19 process, which is one of the herbal supplement usage variables ($\chi^2=11.170$, $p< .01$). Also, 53.10% of the participants who had had COVID-19 and 37.58% of those who had not had the disease were found to use herbal supplements.

Table 6 presents the findings of the chi-square analysis conducted to compare the use of herbal supplements and the knowledge and attitudes towards using herbal supplements according to the status of having received education on medicinal plants.

According to the status of having received education on medicinal plants, there was a significant difference in the variable of using herbal supplements for colds ($\chi^2= 6.800$, $p< .05$), which is one of the variables of using herbal supplements. When the percentage distributions of these variables, which showed a significant difference, were examined, it was found that the majority of the participants who had and had not received education on medicinal plants used herbal supplements for colds, 23.99% of those who had received education on medicinal plants and 32.85% of those who had not were found to sometimes use medicinal plants.

According to the status of having received education on medicinal plants, there was a significant difference in the variables of primary sources of information about herbal supplements ($\chi^2= 28.139$, $p< .001$) and primary sources of information on problems related to herbal supplements ($\chi^2= 24.650$, $p< .001$), which are among the variables of knowledge and attitudes towards using herbal supplements. When the percentage distributions of the variables that showed a significant difference were examined, the majority of the participants who had received education on medicinal plants were found to mostly turn to the Internet (34.80%) and pharmacists (34.12%) for using herbal supplements, whereas those who had not received education on medicinal plants mostly got information from the Internet (37.50%) and doctors (36.05%). When the primary sources of information regarding the problems related to herbal supplements were examined, 49.32% of those who had received education on medicinal plants primarily consulted doctors, and the rate of participants primarily consulting a doctor among those who had not received education on medicinal plants was 59.01%.

Table 2. Comparison of the use of herbal supplements and the knowledge and attitudes towards using herbal supplements by gender

		Gender				Total (n=640)		χ^2	P
		Male (n=146)		Female (n=494)					
		f	%	f	%	f	%		
Status of Using Herbal Supplements									
Using herbal supplements for colds	Yes	62	42.47	298	60.32	360	56.25	30.289	0.000
	Sometimes/ Not sure	42	28.77	142	28.74	184	28.75		
	No	42	28.77	54	10.93	96	15.00		
Using herbal supplements before COVID-19	Yes	46	31.51	217	43.93	263	41.09	7.182	0.007
	No	100	68.49	277	56.07	377	58.91		
Using herbal supplements during COVID-19	Yes	51	34.93	212	42.91	263	41.09	2.967	0.085
	No	95	65.07	282	57.09	377	58.91		
Primary option against diseases	Herbal supplement	69	47.26	295	59.72	364	56.88	7.129	0.008
	Medication	77	52.74	199	40.28	276	43.13		
Knowledge and Attitudes Towards Using Herbal Supplements									
Primary sources of information about herbal supplements	Friends	15	10.27	36	7.29	51	7.97	8.101	0.044
	Doctors	40	27.40	158	31.98	198	30.94		
	Pharmacists	27	18.49	132	26.72	159	24.84		
	Internet	64	43.84	168	34.01	232	36.25		
Relying on herbal products recommended on the Internet and social media to protect against COVID-19	Yes	8	5.48	31	6.28	39	6.09	0.173	0.917
	Sometimes	65	44.52	223	45.14	288	45.00		
	No	73	50.00	240	48.58	313	48.91		
Knowing about the side effects of herbal products	Yes	56	38.36	242	48.99	298	46.56	18.238	0.000
	Somewhat/ Not sure	50	34.25	189	38.26	239	37.34		
	No	40	27.40	63	12.75	103	16.09		
Primary sources of information on problems related to herbal supplements	Family	20	13.70	71	14.37	91	14.22	1.067	0.785
	Doctors	81	55.48	268	54.25	349	54.53		
	Pharmacists	20	13.70	82	16.60	102	15.94		
	Internet	25	17.12	73	14.78	98	15.31		

χ^2 : Pearson chi-square value, f: frequency, p: probability value

Table 3. Comparison of the use of herbal supplements and knowledge and attitudes towards using these products according to students' schools

		School				Total (n=640)		χ^2	p
		Faculty of Health Sciences (n=99)		Health Vocational Higher School (n=541)					
		f	%	f	%	f	%		
Status of Using Herbal Supplements									
Using herbal supplements for colds	Yes	57	57.58	303	56.01	360	56.25	3.619	0.164
	Sometimes/ Not sure	33	33.33	151	27.91	184	28.75		
	No	9	9.09	87	16.08	96	15.00		
Using herbal supplements before COVID-19	Yes	46	46.46	217	40.11	263	41.09	1.396	0.237
	No	53	53.54	324	59.89	377	58.91		
Using herbal supplements during COVID-19	Yes	44	44.44	219	40.48	263	41.09	0.543	0.461
	No	55	55.56	322	59.52	377	58.91		
Primary option against diseases	Herbal supplement	62	62.63	302	55.82	364	56.88	1.579	0.209
	Medication	37	37.37	239	44.18	276	43.13		
Knowledge and Attitudes Towards Using Herbal Supplements									
Primary sources of information about herbal supplements	Friends	13	13.13	38	7.02	51	7.97	5.123	0.163
	Doctors	32	32.32	166	30.68	198	30.94		
	Pharmacists	20	20.20	139	25.69	159	24.84		
	Internet	34	34.34	198	36.60	232	36.25		
Relying on herbal products recommended on the Internet and social media to protect against COVID-19	Yes	2	2.02	37	6.84	39	6.09	3.514	0.173
	Sometimes	48	48.48	240	44.36	288	45.00		
	No	49	49.49	264	48.80	313	48.91		
Knowing about the side effects of herbal products	Yes	49	49.49	249	46.03	298	46.56	3.123	0.210
	Somewhat/ Not sure	40	40.40	199	36.78	239	37.34		
	No	10	10.10	93	17.19	103	16.09		
Primary sources of information on problems related to herbal supplements	Family	19	19.19	72	13.31	91	14.22	5.786	0.123
	Doctors	57	57.58	292	53.97	349	54.53		
	Pharmacists	9	9.09	93	17.19	102	15.94		
	Internet	14	14.14	84	15.53	98	15.31		

χ^2 : Pearson chi-square value, f: frequency, p: probability value

Table 4. Comparison of the use of herbal supplements and knowledge and attitudes towards using these supplements according to the status of having had the COVID-19 disease

		Status of having had COVID-19				Total (n=640)		χ^2	p
		Yes (n=145)		No (n=495)		f	%		
		f	%	f	%				
Status of Using Herbal Supplements									
Using herbal supplements for colds	Yes	90	62.07	270	54.55	360	56.25	4.714	0.095
	Sometimes/ Not sure	41	28.28	143	28.89	184	28.75		
	No	14	9.66	82	16.57	96	15.00		
Using herbal supplements before COVID-19	Yes	64	44.14	199	40.20	263	41.09	0.718	0.397
	No	81	55.86	296	59.80	377	58.91		
Using herbal supplements during COVID-19	Yes	77	53.10	186	37.58	263	41.09	11.170	0.001
	No	68	46.90	309	62.42	377	58.91		
Primary option against diseases	Herbal supplement	84	57.93	280	56.57	364	56.88	0.085	0.770
	Medication	61	42.07	215	43.43	276	43.13		
Knowledge and Attitudes Towards Using Herbal Supplements									
Primary sources of information about herbal supplements	Friends	17	11.72	34	6.87	51	7.97	3.753	0.289
	Doctors	43	29.66	155	31.31	198	30.94		
	Pharmacists	33	22.76	126	25.45	159	24.84		
	Internet	52	35.86	180	36.36	232	36.25		
Relying on herbal products recommended on the Internet and social media to protect against COVID-19	Yes	10	6.90	29	5.86	39	6.09	2.837	0.242
	Sometimes	73	50.34	215	43.43	288	45.00		
	No	62	42.76	251	50.71	313	48.91		
Knowing about the side effects of herbal products	Yes	62	42.76	236	47.68	298	46.56	1.090	0.580
	Somewhat/ Not sure	58	40.00	181	36.57	239	37.34		
	No	25	17.24	78	15.76	103	16.09		
Primary sources of information on problems related to herbal supplements	Family	22	15.17	69	13.94	91	14.22	3.548	0.315
	Doctors	79	54.48	270	54.55	349	54.53		
	Pharmacists	17	11.72	85	17.17	102	15.94		
	Internet	27	18.62	71	14.34	98	15.31		

χ^2 : Pearson chi-square value, f: frequency, p: probability value

Table 5. Comparison of the use of herbal supplements and knowledge and attitudes towards using these supplements according to the status of having received pharmacology education

		Having received pharmacology education				Total (n=640)		χ^2	p
		Yes (n=483)		No (n=157)					
		f	%	f	%	f	%		
Status of Using Herbal Supplements									
Using herbal supplements for colds	Yes	273	56.52	87	55.41	360	56.25	0.830	0.660
	Sometimes/ Not sure	135	27.95	49	31.21	184	28.75		
	No	75	15.53	21	13.38	96	15.00		
Using herbal supplements before COVID-19	Yes	199	41.20	64	40.76	263	41.09	0.009	0.923
	No	284	58.80	93	59.24	377	58.91		
Using herbal supplements during COVID-19	Yes	196	40.58	67	42.68	263	41.09	0.215	0.643
	No	287	59.42	90	57.32	377	58.91		
Primary option against diseases	Herbal supplement	279	57.76	85	54.14	364	56.88	0.634	0.426
	Medication	204	42.24	72	45.86	276	43.13		
Knowledge and Attitudes Towards Using Herbal Supplements									
Primary sources of information about herbal supplements	Friends	35	7.25	16	10.19	51	7.97	9.991	0.019
	Doctors	141	29.19	57	36.31	198	30.94		
	Pharmacists	134	27.74	25	15.92	159	24.84		
	Internet	173	35.82	59	37.58	232	36.25		
Relying on herbal products recommended on the Internet and social media to protect against COVID-19	Yes	28	5.80	11	7.01	39	6.09	0.303	0.859
	Sometimes	218	45.13	70	44.59	288	45.00		
	No	237	49.07	76	48.41	313	48.91		
Knowing about the side effects of herbal products	Yes	233	48.24	65	41.40	298	46.56	2.265	0.322
	Somewhat/ Not sure	174	36.02	65	41.40	239	37.34		
	No	76	15.73	27	17.20	103	16.09		
Primary sources of information on problems related to herbal supplements	Family	64	13.25	27	17.20	91	14.22	9.612	0.022
	Doctors	258	53.42	91	57.96	349	54.53		
	Pharmacists	89	18.43	13	8.28	102	15.94		
	Friends	72	14.91	26	16.56	98	15.31		

χ^2 : Pearson chi-square value, f: frequency, p: probability value

Table 6. Comparison of the use of herbal supplements and the knowledge and attitudes towards using herbal supplements according to the status of having received education on medicinal plants

		The status of having received education on medicinal plants				Total (n=640)		χ^2	P
		Yes (n=296)		No (n=344)					
		f	%	f	%	f	%		
Status of Using Herbal Supplements									
Using herbal supplements for colds	Yes	174	58.78	186	54.07	360	56.25	6.800	0.033
	Sometimes/ Not sure	71	23.99	113	32.85	184	28.75		
	No	51	17.23	45	13.08	96	15.00		
Using herbal supplements before COVID-19	Yes	122	41.22	141	40.99	263	41.09	0.003	0.953
	No	174	58.78	203	59.01	377	58.91		
Using herbal supplements during COVID-19	Yes	116	39.19	147	42.73	263	41.09	0.825	0.364
	No	180	60.81	197	57.27	377	58.91		
Primary option against diseases	Herbal supplement	177	59.80	187	54.36	364	56.88	1.917	0.166
	Medication	119	40.20	157	45.64	276	43.13		
Knowledge and Attitudes Towards Using Herbal Supplements									
Primary sources of information about herbal supplements	Friends	18	6.08	33	9.59	51	7.97	28.139	0.000
	Doctors	74	25.00	124	36.05	198	30.94		
	Pharmacists	101	34.12	58	16.86	159	24.84		
	Internet	103	34.80	129	37.50	232	36.25		
Relying on herbal products recommended on the Internet and social media to protect against COVID-19	Yes	22	7.43	17	4.94	39	6.09	1.802	0.406
	Sometimes	133	44.93	155	45.06	288	45.00		
	No	141	47.64	172	50.00	313	48.91		
Knowing about the side effects of herbal products	Yes	152	51.35	146	42.44	298	46.56	5.083	0.079
	Somewhat/ Not sure	101	34.12	138	40.12	239	37.34		
	No	43	14.53	60	17.44	103	16.09		
Primary sources of information on problems related to herbal supplements	Family	37	12.50	54	15.70	91	14.22	24.650	0.000
	Doctors	146	49.32	203	59.01	349	54.53		
	Pharmacists	70	23.65	32	9.30	102	15.94		
	Friends	43	14.53	55	15.99	98	15.31		

χ^2 : Pearson chi-square value, f: frequency, p: probability value

4. DISCUSSION

Herbal supplements are consumed unconsciously because they are not in the prescription drug group. Although people who have not received health education do not have enough information about herbal supplements, their posts on the Internet and social media endanger human health. At the same time, some plants are shown as healing and miraculous plants by herbalists, which increases the demand for herbal supplements. With the onset of the COVID-19 pandemic, the use of herbal supplements has become more widespread with the increase in posts that they have positive effects on the immune system. In our study, we investigated whether university students in the field of health used herbal supplements rationally and their knowledge levels on this subject. A similar study was conducted by Büyüker SM at Üsküdar University Faculty of Health Sciences in 2020 on rational antibiotic use, and as a result of the study, although most of the participants had enough knowledge about rational antibiotic use (RAU), it was found that the majority of them needed more education on rational drug use (RDU) and RAU and that most of them wanted to treat diseases with alternative treatments (22). Also, Büyüker SM et al. (2018) studied the effect of the pharmacology education received by the students of the Pharmacy Services Technician program in the same university on their RDU attitudes and found that the students had enough level of knowledge on RDU (23). In a study conducted by Aldwihi Leen A. et al. in Saudi Arabia, the use of herbal supplement products before and after the COVID-19 pandemic was investigated, and it was observed that the use of herbal supplements increased significantly during the pandemic process (4). The present study was conducted with the participation of health students, and the demographic characteristics of the students, their status of having had COVID-19 viral infection, whether they used herbal supplements during the pandemic process, whether they had received education on pharmacology and medicinal plant products, and the information sources they consulted while using these supplements were investigated. The results of the study indicated that while the majority of the males (52.74%) used medications against diseases, the majority of the females used herbal supplements (59.72%). While the males and females obtained information about herbal supplements from the Internet most, this rate was 43.84% in males and 34.01% in females. However, while the majority of the males and females knew that herbal products might have side effects, this rate was 38.36% in males and 48.99% in females. In other words, females used the Internet less as a source of information compared to males, and they knew more about the side effects of herbal products. Also, 53.10% of the participants who had had COVID-19 and 37.58% of those who had not had COVID-19 used herbal supplements. As the results of the study suggest, having had the COVID-19 infection increased the interest in herbal supplements. When the participants who had and had not received education on pharmacology and medicinal plants were compared, it was determined that those who had received education on these subjects consulted doctors and pharmacists more than those

who had not. It was found that the students' confidence in herbal supplements recommended for protection against COVID-19 on the Internet and social media was at a low level. These results show us that it is extremely important for health students to receive pharmacology education on rational use of herbal supplements and medicinal plant supplements.

5. CONCLUSION

In this study, we investigated the status of having had COVID-19 viral infection, use of herbal supplements, the status of having received education on pharmacology and medicinal plant products, the sources of information used before using herbal supplements, and the effects of the Internet and social media on the use of herbal supplements. In conclusion, it was found that the students exhibited a rational approach to herbal supplements since they were studying health sciences and they had received education on pharmacology and medicinal plant products. As a result of the study, it is thought that provision of students with more information on phytotherapy within the targeted pharmacology education and supporting pharmacology courses with seminars to be given in the field of phytotherapy, if necessary, will be effective in the rational use of herbal supplements and prevent health problems that may occur as a result of some disinformation via the Internet and social media.

Since bivariate chi-square analysis allows examining the relationship between two categorical variables, this analysis was used in the examination of the study data. With the chi-square analysis, the knowledge and attitudes of the participants towards the rational use of herbal supplements and the use of herbal supplements were compared according to their gender, school, the status of having had COVID-19, and status of having received education on pharmacology and medicinal plants. The analyses were conducted on the IBM SPSS Statistic 22 software package and the level of significance was determined as $\alpha = 0.05$

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Ethics Committee Approval: This study was approved by Üsküdar University Non-Interventional Research Ethics Committee was obtained (Decision No: 61351342 /May 2021-44).

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